EAST FORK IRRIGATION DISTRICT

SYSTEM IMPROVEMENT PLAN

Prepared by

Farmers Conservation Alliance

August 2018

Submitted to East Fork Irrigation District

VERSION: FINAL

Executive Summary

Farmers Conservation Alliance (FCA) commissioned this System Improvement Plan (SIP) with support from the Energy Trust of Oregon. The purpose of this SIP is to evaluate East Fork Irrigation District's (EFID or District) water delivery system and provide a plan for modernization, mitigating overflows, improving operations and maintenance, and implementing pressurized deliveries. System piping is the primary method proposed for such improvements.

In April 2016, FCA began working with EFID to develop a SIP for the District and fulfill data requests. At that meeting, the District agreed that a value of 5.62 gpm per acre should be used for hydraulic modeling and pipe-sizing purposes. Two alternatives were proposed, one considering a fully piped water delivery system (Alternative A), and the other, for an almost entirely piped system, emphasizing the removal of sediment and silt from the diverted water (Alternative B). System design concepts and associated cost estimates were created for each alternative, along with dividing the entire project into specific project groups, thereby providing the District flexibility in implementing the proposed improvements.

In 2015, Mark Wharry, an engineer with KPFF Consulting Engineers, prepared the *East Fork Irrigation District System Improvement Plan,* which also outlined modernization projects for the District. The overall objectives and projects proposed by Wharry (2016) are similar to what is outlined in this SIP. However, FCA's objective in this SIP is to design a completely pressurized system, whereas most of the piping projects proposed by Wharry (2016) assume that the District will be entirely piped and pressurized at some indeterminate time in the future.

The District is served by one diversion, the East Fork Hood River (EFHR), providing water to four service areas. District canals and pipelines generally run north from the EFHR. According to the District's water rights certificates, the District currently serves 9,596 acres of irrigated cropland. Due to minor discrepancies in water accounting data versus the water rights certificates, the total acreage modeled in this SIP is 9,616 acres. This modeling assumption ensures that new piping is sized properly to serve all existing and future pipelines.

The primary goal of both alternatives, A and B, is to provide the greatest useable pressure to all patrons throughout the District. Useable pressure is defined as gravity-fed, dynamic pressure that the patrons can use for irrigation; the District agreed that a dynamic pressure of 40 psi is necessary for adequate on-farm pressurization. However, the model was also designed to not exceed a static pressure of 100 psi at any given user. Pressure reducing valve (PRV) stations were placed in strategic locations to dissipate excess energy where static pressures exceed 100 psi, while also providing dynamic pressures of at least 40 psi. These valve locations may also be feasible for hydroelectric energy generation.

Under Alternative A, the entire District delivery system would be fully piped and pressurized. To improve upon the District's current fish screening operations and ensure they are compliant with National Marine Fisheries Service (NMFS) criteria, a horizontal, flat-plate fish and debris screen would be installed immediately downstream of the EFID point of diversion. The horizontal fixed-plate screen would also provide additional sediment removal. The Sand Trap would be used as a secondary sedimentation facility as necessary and used for fish acclimation by the Oregon Department of Fish and Wildlife (ODFW). The estimated capital cost for Alternative A is $77,486,000.

NLine Energy Inc. evaluated the in-conduit hydroelectric energy generation potential associated with pressurizing the District and estimated a power potential of 2,650 kilowatts (kW) and an annual energy generation potential of 10,000,000 kilowatt-hours (kWh) that could be developed under Alternative A. FCA evaluated the on-farm energy conservation potential associated with fully piping and pressurizing the District, and Alternative A is estimated to reduce on-farm pump energy requirements by as much as 1,246,584 kWh per year.

Under Alternative B, most of the District delivery system would be piped and pressurized with a focus on enhancing sediment removal as much as possible. From the point of diversion to the Coanda Screen/Sand Trap, the approach canal would remain open and would be widened to incorporate several check dams slowing the flow and encouraging sedimentation. A horizontal, flat-plate screen would be installed in the same manner as described for Alternative A. The estimated capital cost for Alternative B is $75,932,000. The hydroelectric power and energy potential would not be impacted by the decreased piping in the Main Canal and are expected to be the same as Alternative A. Piping the District under Alternative B will accomplish moderate to full pressurization across the District resulting in an estimated annual energy reduction of 1,169,706 kWh.

FCA measured average overflows of 16.6 cfs within the District based on the *2016 and 2017 FCA End Spill Data Collection and Analysis* study. FCA estimated a water conservation potential of 21.5 cfs, assuming a conserved diverted flow of 96 cfs under a piped and pressurized system, as compared to a historical maximum diverted flow of 117 cfs (excluding Mount Hood Irrigation District flows) measured between 2001 and 2017. Given that measured flows are comparable to the water conservation estimate, FCA recommends using measured losses to approximate the potential for water conservation in the District. However, verification of these measurements should be completed before the District conducts any water conservation transfers associated with piping.

Table ES-1 summarizes the capital costs, on-farm energy conservation, in-conduit hydroelectric potential, and water conservation potential associated with Alternatives A and B. FCA recommends the District proceed with Alternative B to improve diversion water quality as much as possible. This alternative also provides a lower capital cost, and even though the projected energy conservation potential is less than Alternative B, they are comparable. The water conservation associated with Alternatives A and B are expected to be comparable given that both alternatives will eliminate all overflows.

TABLE ES-1. SUMMARY OF ALTERNATIVE A AND B IMPROVEMENTS FOR EAST FORK IRRIGATION DISTRICT.

Improvement Items	***Alternative A***	***Alternative B***
Capital Costs	$77,486,000	$75,932,000
Annual On-farm Energy Conservation (kWh)	1,246,584	1,169,706
In-Conduit Hydroelectric Power Potential (kW)	2,650	2,650
Annual In-Conduit Hydroelectric Energy Potential (kWh)	10,000,000	10,000,000
Water Conservation Potential (cfs)	16.6	16.6

Due to the preliminary nature of NLine's assessment, FCA recommends that the two preferred locations for hydropower development be re-evaluated with respect to the expected flow. Given the significant number of PRVs that will be required for Alternative A or B, FCA also recommends that additional analyses are completed to assess the micro-hydroelectric energy potential associated with the PRVs. FCA also recommends capital costs be reassessed when it's time for detailed design, given the volatility of High Density Polyethylene (HDPE) pricing.

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CERTIFICATION BY A LICENSED PROFESSIONAL ENGINEER

The undersigned Registered Professional Engineer certifies this report was prepared under their direct supervision and is a duly Licensed Professional Engineer under the laws of the state of Oregon.

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Signature: ______________

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Section 1
Project Overview and Description

1.1 AUTHORIZATION

Farmers Conservation Alliance (FCA) commissioned this System Improvement Plan (SIP) for East Fork Irrigation District (EFID or District) with support from the Energy Trust of Oregon. The SIP has been authorized through a Consultant Services agreement between EFID and FCA. Appendix A provides the Scope of Services provided by FCA and agreed upon by the District.

1.2 PURPOSE

The System Improvement Plan is a key component of FCA's Irrigation Modernization Program (IMP). The IMP is designed to assist irrigators and irrigation districts in creating modernization strategies for their irrigation water delivery systems that reduce barriers to implementation while increasing opportunities for funding and support. The end goal is to provide all users with a more reliable source of irrigation water through modernization of a district's distribution system. Another key component of the IMP is to analyze the energy conserved as a result of a pressurized delivery system and the potential of hydroelectric energy generation.

The purpose of this document is to provide a technical evaluation of the District's existing delivery system and how it could be modernized. This evaluation includes a mitigation plan for water losses via seepage or overflows, improvements to fish screening and passage, strategies to improve the quality of the District's water source, and a high-level design of an almost entirely pressurized delivery system. GIS mapping, a water loss assessment, and historical water supply data were used to develop a modernized distribution system in accordance with the District's vision. Consistent with the modernization projects EFID has already implemented, piping the remaining canals and replacing outdated piping is the primary method proposed in this report.

This technical report is meant to be used as a planning document by the District to provide a basis for phased construction of the conveyance system improvements.

Section 2
Existing System

2.1 IRRIGATION DISTRICT OVERVIEW

East Fork Irrigation District is located on the northeast part of the Hood River Valley. The District encompasses roughly 15,150 acres of which approximately 9,600 acres of water rights are allocated. The District is bound by Mount Hood to the south, the Columbia River to the north, the East Fork and main stem Hood River to the west, and the Hood River Mountain and East Hills to the east. The District diverts water for both EFID and Mt. Hood Irrigation District, and delivers water for irrigation, spray, frost, and fire protection.

2.1.1.1 Diversion

The District has a single point of diversion, located on the east bank of the East Fork Hood River (EFHR), to the south of Tollbridge Park near the community of Mt. Hood. From the early 1900s up until 2013, the diversion structure consisted of a 12-feet-wide by 4.5-feet-high vertical actuated headgate with reinforced concrete wing walls extending about 8 feet on each side. During the irrigation season, a rock push-up dam was used to impound water and provide a forebay at the headgate.

In 2013, the District's aging diversion structure was replaced and now includes the following elements:

- An Obermeyer inflatable bladder-control gate, mounted on a concrete apron, that spans the river. During the irrigation season the gate is raised to create a forebay. The control gate is lowered during non-irrigation season, allowing the river to flow normally and provide capacity to pass flood events.
- A vertical-slot fishway is located adjacent to the headgate structure and provides fish passage when the control gates are raised during the irrigation season.
- A headgate structure consisting of four 48-inch, square, stainless steel slide gates. The gates are configured perpendicular to river flow and elevated above the base of the concrete apron.

2.1.2 SEDIMENT MANAGEMENT AND FISH SCREENING

The EFHR's high glacial till requires that sediment be separated from irrigation water near the point of diversion. A large proportion of the sediment load is delivered during the irrigation season when glacial melt is at its highest. Since 1996, the District has operated an integrated sand settling trap and fish screen facility within its Main Canal about 2,300 feet from the diversion. The Sand Trap is a 90 by 66-foot concrete structure with five 12-foot wide settling bays. The settling bays vary in depth from 4 to 10 feet and provide approximately 6,800 cubic feet of settling water volume. At peak flow, each settling bay can handle 32 cfs with a residence time of approximately 4 minutes. This residence time is adequate to settle medium sand and a large fraction of fine sand, while silt and clay particles currently pass through the system into the District canals (Wharry 2016).

Design specifications for the Sand Trap facility include the need to separate, retain, and eventually dispose of at least 1,000 cubic yards of sand within an 8-hour period (Buell and Associates 2000). Sediment that accumulates in the downstream end of the trap is discharged to the EFHR through sluice gates and a bypass channel that also serves as a fish return channel. Low gradient sections of the canal upstream of the Sand Trap provide additional settling capacity. An excavator is used to remove accumulated sand and silt from these areas. In some years, this material amounts to thousands of yards stockpiled along the access road or hauled offsite.

Fish screening is provided by a fixed-plate, Coanda-type screen, fitted into the downstream end of each settling bay of the Sand Trap. Wedge-wire profile screen bars are oriented perpendicular to the flow passing over the screen face. A portion of water and fish pass over the screens while the diverted flow falls through the screens and continues to the EFID system. The screens are self-cleaning due to the high sweeping velocity of water spilling over the weir. A bypass flow is maintained at the toe of the screens to convey fish back to the river within a 275-foot long bypass channel. The upstream portion of the bypass channel is made of concrete and the downstream portion is excavated open channel. At peak flow, EFID diverts 10 to 20 cfs of bypass flow to convey fish, debris, and any sediment back to the river (Wharry 2016).

The EFID Coanda screen design was developed in the mid-1990s in consultation with National Marine Fisheries Service (NMFS) engineers and in coordination with the Oregon Department of Fish and Wildlife (ODFW) and the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWS). Final design and construction of the Sand Trap and screening facility was fast-tracked in response to the complete destruction of an older EFID sand trap by the 1996 flood (Buell and Associates 2000). Design and construction was accomplished with funding assistance from CTWS.

Coanda screens are regarded as experimental technology by NMFS. A specific research and validation process is required for NMFS to consider experimental technology as providing fish protection that is equal to conventional fish screens. This process includes laboratory tests, field prototype evaluations, and biological tests (NMFS 2011). Although not all of NMFS' experimental technology process has been completed for the EFID screen, biological performance tests conducted in 1999 found no injuries, behavioral anomalies, or latent mortalities resulting from passage over the weir and screen for any of the fish species and life stages that were tested (Buell and Associates 2000). However, only the weir and screen components of the facility were tested, and testing did not include the effects on fish from the point of diversion to the point of the bypass channel discharge to the river (CBFWA 2005).

NMFS periodically publishes detailed criteria and guidelines for the design and maintenance of new fish screens, and for the approval of existing screens (e.g. NMFS 2011). Much of the NMFS criteria are applicable to conventional screen designs, such as rotating drum screens and vertical screens, whereas criteria for elements such as screening material, screen openings, and bypass return conditions apply to all screen designs. Compared to NMFS criteria for horizontal fish screens, Coanda screens do not meet the current criteria for approach velocity and bypass flow depth.

Disadvantages reported for Coanda screen designs include the need to adjust the bypass flow rate to prevent dewatering at the lower portion of the screen and/or a loss of bypass flow during low flow periods. Sufficient water depths must be maintained over the lower end of the screen to prevent excessive fish contact with the screen surface, which could result in fish injury or mortality (BOR 2006). The flow rate control and self-cleaning function of the screen are not always reliable (QW Consulting 2018).

As with any type of fish screen, worn screening material is a maintenance concern because of potential injury to fish. Participants at a Columbia Basin Agency Fish Screening Workshop noted that the profile bar screening material at the EFID screen had experienced wear due to heavy silt loads after nine years of operation (CBFWA 2005).

The potential for behavioral delay associated with the long distance of canal between the diversion and the EFID screen is of concern for migratory fish, as is the potential descaling of fish at a turbulent and tight bend in the bypass channel (R. French, personal communication, March 8, 2018). Pacific lamprey juveniles were recently found in the canal substrates upstream of the Sand Trap facility. The ability of the EFID Sand Trap and fish screen facility to safely pass lamprey juveniles is of potential concern (B. Eineichner, personal communication, March 2, 2018).

The length of canal from the point of diversion to the EFID fish screen, the half mile reach of bypass flow back to the EFHR, and the bypass outfall have other effects on aquatic life. Trapping and stranding hazards to fish and other aquatic life occur in the canal between the diversion and the fish screen facility when the canal is dewatered at the end of the irrigation season. Tribal fisheries personnel conduct a fish salvage effort along the canal each year, netting juvenile fish from residual pools for release back into the river. NMFS criteria for new screen installations in canals specify that the screen design must minimize the effects of the diversion on instream flows by placing the bypass channel outfall as close as feasible to the point of diversion.

2.1.3 DELIVERY SYSTEM

Irrigation supply water enters the Main Canal immediately after being screened through the Coanda screen. The Main Canal is unlined and varies in width from 10 to 20 feet, having an average depth of 2.5 feet (EFID 2011). The Fisher, Bowcut, Arens, and Christopher pipelines receive water from the Main Canal and account for 4 miles of piping.

Water is conveyed approximately 6.8 miles along the Main Canal until the Distribution Center where the system splits into two laterals: the Central Lateral Pipeline (CLP) and Dukes Valley Canal (DVC). At the Distribution Center, a traveling belt screen provides additional screening to remove debris accumulated in the Main Canal.

The DVC generally conveys water to the northwestern extent of the District and is approximately 5.0 miles long. The DVC is unlined and is estimated to be 10 feet wide and 2 feet deep for most of its course. The Cameron Hill, Cherry Hill, Marsh/Chamberlin, Sheirbon Hill, and Shute Road lateral pipelines receive water from the DVC. The DVC and its laterals supply water to approximately 1,900 acres. The lateral piping is primarily schedule 40 or 80 polyvinyl chloride (PVC) with small sections piped with asbestos cement (i.e., transite), concrete, or wood. The DVC transitions to the newly completed Highline Pipeline, which is approximately 2.6 miles long.

The CLP is approximately 4.5 miles in length and supplies water to ten sub-lateral pipelines, which account for an additional 21.5 miles of piping. The CLP was constructed in 2007 and consists of the following piping listed sequentially: approximately 6,000 feet of 72-inch Weholite, 3,765 feet of 60-inch Weholite, 5,000 feet of 48-inch solid wall HDPE, and 8,938 feet of coated steel. The sub-laterals are piped with materials similar to the DVC.

The CLP discharges into the Eastside Canal, which is approximately 6.1 miles in length and located in the northeastern extent of the District. The Eastside Canal is unlined and ranges in width from 4 to 14 feet and is 2 feet deep (EFID 2011). The Eastside Canal supplies irrigation water to seven piped laterals with piping materials similar to lateral pipelines off the DVC. The Eastside Canal transitions into the Whiskey Creek Pipeline and several laterals.

The following Table 2-1 summarizes the lengths of open canals and pipelines in Main, Dukes Valley, Central, and Eastside service areas of EFID. Figure 1 provides a map of the District's headworks, Coanda Screen and Sand Trap, and an overview of the existing delivery system.

TABLE 2-1. SUMMARY OF PIPELINE AND CANAL LENGTHS IN EAST FORK IRRIGATION DISTRICT.

District Area	*Canal Length (mi)*	*Pipeline Length (mi)*	*Total Length[1] (mi)*
Main	6.8	4.0	10.8
Central		26.1	26.1
Dukes Valley	5.0	16.4	21.4
Eastside	6.1	18.4	24.5
Total:	**17.9**	**64.9**	**82.8**

Notes:

1. Total lengths presented do not include privately maintained or overflow lines in the District, which account for approximately an additional 9.3 and 9.9 miles, respectively (Christensen 2013a).

2.2 WATER RESOURCES

Water resources information discussed in this section includes: the hydrology and ecology of the EFHR, the District's source of irrigation water, the water quality of the EFHR, and the District's water rights and usage. This section also provides an evaluation of water losses in the delivery system.

2.2.1 WATERSHED HYDROLOGY AND ECOLOGY

The EFHR is 27.4 miles long and originates on the Newton-Clark Glacier on the east slopes of Mt. Hood. The river flows for approximately 15 miles along and through glacial and fluvial deposits, and through a narrow bedrock canyon, before reaching the upper Hood River Valley. Frequent landslides and debris flows originating from upper tributary drainages have helped to form the EFHR's broad valley floor and dynamic, braided channel.

The hydrology of the Hood River Basin is characterized by highly variable streamflow and rapid runoff. Runoff is especially rapid in early winter before freezing conditions arrive at high elevations. Snowmelt typically begins in April. Glacial melt contributes to streamflow and generally occurs between July and October. Because of its glacial and volcanic origins, the EFHR has a high suspended sediment and bed load. During warm air temperatures on Mt. Hood, glacial flour transported from headwater areas can dramatically increase water turbidity.

The EFHR has no long-term stream gaging and historical streamflow data is limited. Simulated natural monthly average streamflows for the water years 1980 through 2009 ranged from 145 cfs in September to 383 cfs in March (BOR 2014). Annual peak simulated flows ranged from approximately 400 cfs to 2,700 cfs during this period (Normandeau and Associates 2014).

Mt. Hood's glaciers have been steadily receding since the mid-1900s or earlier. Glacial recession and decreased snowpack are expected to continue as a result of the warmer temperatures predicted with the changing climate. Modeling developed to simulate the impacts of changing climate patterns on Hood River Basin streamflows suggests that while projected changes in precipitation and temperature will increase streamflows during the fall and winter, the principal effect on basin hydrology is expected to lower spring and summer streamflows (BOR 2014). The modeled future decline in average natural streamflows in the EFHR for the months of May through September approached 30 percent for the period 2030 to 2059 compared to the base period 1980 to 2009. Anticipated climate change effects include a shift in the timing of peak runoff to earlier in the water year. In addition, continued glacial recession likely will expose more loose sand and moraines on Mt. Hood, potentially increasing the frequency of debris flows and periods of heavy suspended sediment loads.

The EFHR provides spawning and rearing habitat for anadromous fish that are listed as threatened species under the Endangered Species Act. These species include winter steelhead, coho, and spring Chinook salmon. Other fish present in the EFHR include Pacific lamprey, coastal cutthroat trout, rainbow trout, mountain whitefish, largescale sucker, and several species of sculpin. Of these, coastal cutthroat trout and Pacific lamprey have both a federal status of "species of concern" and a state status of "sensitive." Pacific lamprey are re-colonizing the Hood River Basin after the removal of the Powerdale Dam on the main stem Hood River in 2010. Lamprey juveniles have been found in the EFID Main Canal upstream of the Sand Trap.

The District's operational effects on streamflow levels, fish migration, and water quality in the EFHR results in impacts to aquatic habitat and fish populations. During peak irrigation season, EFID can divert up to 85 percent of the river's natural streamflow. Low summer and early fall streamflows are a primary factor limiting fish species recovery in the Hood River Basin. The EFHR below the EFID diversion has been identified as a top priority for the restoration of streamflow and aquatic habitat (BOR 2015; USDA Forest Service 2006).

2.2.2 DIVERSION WATER QUALITY

Average turbidity measurements taken at the point of diversion range from 1 to 7 Nephelometric Turbidity Units (NTUs) during the fall, winter, and spring months, and 8 to 14 NTUs during the summer when glacial melt peaks (Christensen 2013a). Turbidity can provide a general indication of the solids loading, but does not provide an adequate representation of the course particles in the diverted water. Particle size distribution is a more useful parameter for the characteristics of all solids in the EFHR and for the design of sedimentation facilities. The particle size distribution of the EFHR at the point of diversion hasn't been analyzed. Haritashya et al. (2010) evaluated particle size distribution for glacial runoff from the Gangotri Glacier in the central Himalayas. Haritashya et al.'s (2010) results could provide a rough estimation of particle size distribution for the EFHR and are summarized in Table 2-2.

TABLE 2-2. TYPICAL PARTICLE SIZE DISTRIBUTION OF GLACIAL RUNOFF.

Sediment Type	Particle Size Range (mm)	Fraction by Weight (%)
Clay	Less than 0.002	7
Fine Silt	0.002 – 0.006	12
Medium Silt	0.006 – 0.02	27
Coarse Silt	0.02 – 0.06	30
Fine Sand	0.06 – 0.2	17
Medium Sand	0.2 – 0.6	7

Notes:
Source: Haritashya et al. 2010

The high sediment and silt load in the EFHR translates to operational problems for the District and the plugging of emitters associated with on-farm micro and drip irrigation systems. As described in section 2.2, the District's Sand Trap is their primary method to improve water quality and reduce sediment loading, but EFID also employs small sedimentation ponds in various locations, and individual patrons have filters upstream of their irrigation systems to remove fine particulates.

2.2.3 DISTRICT WATER RIGHTS

EFID currently holds eight water rights certificates, appropriating 117.36 cfs of live flow from the EFHR for irrigation, as summarized in Table 2-3. The District also has 0.18 cfs of industrial water rights that are currently only actively being used by the Hanel Lumber Mill for 10.8 acres. Including the industrial water rights, 9,607.04 acres are allocated to EFID. Additional water rights include 37.1 cfs for frost, spray, and fire protection, 1.02 cfs for instream purposes, and 0.12 cfs of inchoate water rights.

Certificate 92000 limits the diversion of irrigated water to 1/80th of 1 cfs for each acre irrigated or 5.62 gallons per minute (gpm) per acre. The district is obligated to deliver a rate 4.49 gpm per acre to patrons. The difference between the diversion rate and delivery rate accounts for normal losses in the delivery system such as conveyance losses, infiltration, evaporation, and overflows. Water rights certificates permitted to EFID are provided in Appendix B.

TABLE 2-3. EAST FORK IRRGATION DISTRICT WATER RIGHTS.

Certificate Number (Permit Application Number)	*Priority Date*	*Irrigated Lands (ac)*	*Flow (cfs)*
92000[1]	November 25, 1895	8,531.44[2]	104.065[2,3]
80929 (S-29167)	March 13, 1964	478.80	5.99
80928 (S-30825)	August 13, 1965	89.00	1.10
80927 (S-32101)	October 26, 1966	57.00	0.71
80926 (S-32685)	June 14, 1967	25.00	0.31
84803 (S-43395)	August 8, 1977	405.00	5.06
	August 3, 1978		
84802	February 3, 1982	10.00	0.125
	Totals:	**9,596.24**	**117.36**

Notes:
1. Certificate 92000 authorized on October 21, 2016 supersedes the District's original certificate 81340.
2. The total irrigated lands presented include transfers of 3.5 and 5.95 irrigated acres (0.041 and 0.074 cfs) from transfer applications T-9609 and T-9804, respectively.
3. 2.10 cfs and 0.5 cfs were transferred from Certificate 81340 under the OWRD Allocation of Conserved Water Program associated with applications CW-53 and CW-86, respectively, reducing the allocated flow from 106.66 to 104.065 cfs (including 0.12 and 0.18 cfs of inchoate and industrial water rights, respectively).

Mount Hood Irrigation District (MHID) receives irrigation water from EFID and has two points of diversion off the Main Canal. MHID has four water rights allocating 12.65 cfs or 1,017.9 irrigated acres to the district (Christensen 2013b). MHID's use is estimated to be equally distributed between the two MHID diversion points (Christensen 2013b).

2.2.4 DISTRICT WATER USE

Discharge measurements are taken at the OWRD Gaging Station (Station Number 14114000) located approximately 1 mile downstream from EFID's point of diversion and immediately downstream from MHID's first point of diversion. Table 2-4 summarizes monthly diversion volumes estimated from average daily flows measured at Station 14114000 from 2001 to 2017. The monthly volumes include approximately 50 percent of MHID water use, given that the second MHID point of diversion is downstream of the gaging station, and excludes any losses between the point of diversion and Station 14114000. Table 2-5 presents the corrected 2001 to 2017 average water use for EFID excluding MHID's water use.

TABLE 2-4. EAST FORK IRRIGATION DISTRICT'S ESTIMATED MONTHLY AND ANNUAL DIVERSION VOLUMES.

Year	**Monthly Water Volume (af)[1]**												**Annual Water Volume (af)**
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	
2017	900	-	-	-	-	-	1,138	2,516	5,830	6,881	7,157	4,464	28,886
2016	900	-	-	-	-	448	1,803	4,612	6,112	6,990	6,655	4,515	32,035
2015	1,499	-	-	-	-	1,057	2,062	4,601	6,076	6,651	5,693	3,121	30,760
2014	968	-	-	-	-	789	2,150	3,306	6,363	7,099	6,968	4,527	32,170
2013	478	-	-	-	-	746	1,797	4,488	5,356	6,538	6,284	3,105	28,791
2012	992	-	-	-	-	240	1,533	3,119	5,612	6,597	6,703	4,825	29,620
2011	1,180	-	-	14	-	650	1,454	2,344	4,135	6,812	7,040	5,366	28,993
2010	1,003	-	-	-	-	817	1,935	2,645	3,619	6,578	6,710	3,984	27,292
2009	1,162	-	-	-	-	200	1,416	2,330	5,711	6,825	6,913	4,573	29,170
2008	809	-	-	-	-	208	1,224	2,653	5,176	6,546	6,058	4,567	27,240
2007	875	-	-	-	-	317	1,378	3,914	5,999	6,356	6,048	3,712	28,599
2006	1,456	-	-	-	-	631	1,691	4,077	5,580	6,816	6,738	4,295	31,284
2005	99[2]	-	-	-	-	397	1,808	597[2]	202[2]	5,076	6,098	-	14,278
2004	1,463	-	-	-	-	561	1,616	4,791	5,804	6,800	5,537	3,916	30,489
2003	662	-	-	-	-	591	1,630	2,854	6,316	6,857	6,825	4,365	30,100
2002	1,664	-	-	-	-	371	1,771	3,938	6,189	6,913	6,833	5,116	32,961
2001	1,436	-	-	-	-			3,569	6,125	6,570	6,260	4,464	29,210
Total Average Monthly Volume	1,090	66	-	1	-	508	1,640	3,485	5,625	6,739	6,526	4,307	29,850

Notes:

1. Volumes presented include roughly half of the water diverted by MHID and exclude any potential losses between EFID's diversion and Station 14114000.
2. In the months of May, June, September, and October 2005 little to no data were available, which was the result of low water supply (Christensen 2013b).

TABLE 2-5. EAST FORK IRRIGATION DISTRICT'S CORRECTED MONTHLY AND ANNUAL WATER DIVERSION VOLUMES.

	Monthly Water Volume (af)												Annual Water Volume (af)
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	
50% of MHID Use in 2000	17	-	-	-	-	-	37	94	213	312	232	119	1,021
EFID Corrected 2001-2017 Average Use [1]	1,074	66	-	1	-	508	1,603	3,391	5,413	6,428	6,294	4,189	28,829

Notes:

1. Values were estimated by subtracting 50 percent of MHID's diversion amounts in 2000 (MHID has not reported use to OWRD since 2000).

2.2.5 DISTRICT WATER LOSSES

Over the last 13 years, several studies have been conducted by numerous groups within EFID to quantify potential water losses throughout the delivery system. These investigations focused primarily on two sources of water loss: seepage (infiltration) and excess end spills. End spills are points throughout irrigation ditches where excess water is spilled into a ditch, creek, stream, or river. End spills are located at the termination of a canal or lateral to ensure the canal continuously has enough water for all patrons. End spills are losses in the system because the water must be diverted from the river and is not used directly to irrigate crops. The EFID staff monitors and adjusts these end spills daily to reduce the amount of water lost. This can be challenging, as the patrons adjust water deliveries throughout the lateral. A minimum end-spill flow must be maintained in case all patrons are using water at the same time.

The objectives of the water loss assessment were to summarize findings from five selected individual studies, and to consolidate results into an overview for future dissemination. The assessment does not cover a system-wide extrapolation of water loss, given the limited nature of total system data availability and the somewhat inconclusive results. More information about these studies is provided in the comprehensive water loss assessment in Appendix C. Focus was placed on estimating losses using the most comprehensive empirical data available, the *End Spill Data Collection and Analysis (2016 and 2017)* study and using a mass balance approach comparing these estimated losses to the annual water volume diverted by the District and the District's on-farm water use.

Instantaneous flow measured every fifteen minutes from each of the seven overflows were converted to water loss volumes over the irrigation season (June 1 to September 30). These overflow volumes were scaled up by 25 percent to account for the remainder of unmeasured end spills throughout the district, which reflects the methodology that was used by Wharry (2016) to estimate overflows.

Table 2-6 below summarizes the measured annual and average water losses associated with overflows in EFID. These estimates are expected to exceed the actual overflows by as much as 20 percent due to potential measurement errors and some of the malfunctions that occurred as discussed in more detail in Appendix C.

TABLE 2-6. ESTIMATED ANNUAL AND MEASURED LOSSES ASSOCIATED WITH OVERFLOWS IN EAST FORK IRRIGATION DISTRICT.

Ditch Rider Area	Measured Annual Overflow (af)	Estimated Annual Overflow (af)[1]	Average Measured Overflow (cfs)
Eastside	1,319	1,648	6.1
Central	773	967	2.7
Main Canal	1,513	1,573	4.7
Dukes Valley	879	1,099	3.1
Totals:	4,484	5,287	16.6

Notes:
1. Estimates are increased by 25 percent to account for unmeasured overflows.

Section 3
System Improvement Methodology

3.1 DESIGN METHODOLOGY

This section describes the methodologies used to design a pressurized delivery system for EFID and to estimate the costs for the proposed improvements.

3.1.1 HYDRAULIC MODELING

To design a pressurized delivery system for EFID, EPANET was used. EPANET is a computer program developed by the Environmental Protection Agency that simulates dynamic hydraulic behaviors within pressurized pipe networks. EPANET is a free and open-source software conventionally used by multiple public and private organizations to model irrigation distribution networks. The ease of access and wide use of the program allows for the base model created by FCA to be used as a tool for future implementation.

An EPANET network consists of pipes (links), nodes (pipe junctions), pumps, valves, and storage tanks or reservoirs. EPANET tracks the flow of water in each pipe, the pressure at each node, the height of water in each tank, and the concentration of chemical species throughout the network during a simulation period comprised of multiple time steps. In addition to chemical species used for disinfection, water age and source tracing can also be simulated. The following list summarizes EPANET's hydraulic modeling capabilities:

- Unlimited network size
- Friction head loss can be estimated using the Hazen-Williams, Darcy- Weisbach, or Chezy-Manning equations
- Minor head losses for bends, fittings, and other appurtenances
- Constant or variable speed pumps
- Pumping energy and cost
- Various types of valves including shutoff, check, pressure-regulating, and flow-control valves
- Variable tank shape (i.e., diameter can vary with height)
- Multiple demand categories at nodes, each with its own temporal demand pattern
- Pressure-dependent flow issuing from emitters (sprinkler heads)
- System operation based on both simple tank level or timer controls, and on complex rule-based controls

FCA applied the following assumptions when developing the hydraulic model for EFID:

- EFID does not disinfect its irrigation water; therefore, chemical species, water age, and source tracing were not simulated.
- The model was run with only one time step; i.e., the system was not evaluated over an extended period.
- The Hazen-Williams equation was used to quantify friction head losses.
- Minor losses were not evaluated.

Appendix D provides an EPANET generated report that contains computed results for all nodes, links, and time periods used for the EFID hydraulic model. FCA will also provide a program file of the hydraulic model to the District.

3.1.2 WATER DEMANDS

The pressurized delivery system was designed based on the diversion rate of 5.62 gpm per acre. To quantify the irrigated acreage associated with each patron, the District's water accounting data and GIS data were used. Upon review of the water accounting data, FCA was able to verify 9,481.0 irrigated acres out of the 9,607.04 irrigated acres that are allocated to EFID. To account for the missing acreage in the hydraulic model, the water demands were increased by a factor of 1.014 and the total modeled acreage was 9,616. The 5.62 gpm per acre value was referenced to the irrigated acres to determine a water demand per patron in the district.

3.1.3 SPATIAL ORIENTATION AND ELEVATIONS

GIS data for the various system elements and patron turnouts were collected through a field survey performed by District staff and FireWhat Inc. (FireWhat) in 2016. All components of the GIS mapping and modeling were developed in the projected coordinated system, Oregon State Plane, North Zone (ESPG 6559). This collected data was compared to the District's existing GIS data and water accounting data, and updated to correct any discrepancies. The verified GIS data was used to develop the hydraulic model.

Elevations of patron turnouts and other District infrastructure that were incorporated in the hydraulic model were identified by using the Light Detecting and Ranging (LiDAR) data collected by Quantum Spatial in the Fall of 2017. FireWhat used the LiDAR data to identify the alignments of canals in the District. FireWhat also repositioned the locations of turnouts serviced by these canals to the canal centerline. The locations of EFID pipelines could not be identified using the LiDAR data; therefore, locations of mapped turnouts associated with pipelines and the District's alignments of existing pipelines in their GIS data were used.

3.1.4 VELOCITY CRITERIA

Piping was designed to meet the NRCS Conservation Practice Standard Code 430 for Irrigation Pipelines (NRCS Code 430). The pipe was sized to ensure that the full-pipe velocity at 5.62 gpm per acre would not exceed 5 feet per second (fps) as per NRCS Code 430.

3.1.5 PIPE MATERIAL

Pressure pipes are available in a variety of materials, and several materials have been qualitatively assessed. Pipes made of polyvinyl chloride (PVC), high density polyethylene (HDPE), and steel have all been considered. HDPE solid wall pipe (PE4710 resin), conforming to the American Society for Testing and Materials (ASTM) D3350 standard, is proposed as the primary pipe material for piping EFID. PVC pressure pipe may be more cost effective and equally as available as HDPE, but HDPE is far more flexible and ductile than PVC, and is considered to have a significantly longer design life and good abrasion resistance. Most importantly, the flexibility of the HDPE material allows pipes made from it to bend into place to follow the curves in the existing open canal alignments.

Pipe material recommendations are made by engineers at FCA, irrigation district managers in Oregon who have experience piping open canals in their own districts, and guidance from Kevin Crew, P.E., who has several decades of experience designing pressure pipe for irrigation use.

3.1.6 PRESSURE RATING AND REDUCTION

Industry standards use dimension ratios (DR) to specify the pipe's pressure rating and ability to withstand pressure. The DR for HDPE pipe is the ratio of the pipe's outer diameter to its wall thickness. The dimensions of the HDPE-pressure pipe selected for EFID conform to the Iron Pipe Size (IPS) type, where the outside diameter of the pipe is the controlling dimension.

HDPE IPS pipes were selected based on the expected static pressure for each pipe segment. FCA used a maximum static pressure of 100 psi as the upper limit to patron turnouts. To accomplish this, pressure reducing valves (PRVs) were placed throughout the model to ensure static pressures did not exceed 100 psi at any given turnout. The locations and pressure settings of PRVs were designed to provide a pressure of 40 psi or greater to all patrons. However, due to the topographic layout of the system, 40 psi was not always possible. When 40 psi could not be met, the model was adjusted to provide the greatest pressure available, ensuring dynamic pressures at patron turnouts were no less than 4 psi.

3.2 COST ESTIMATING METHODOLOGY

3.2.1 DELIVERY SYSTEM COSTS

3.2.1.1 Piping

Pipe material estimates were provided by Mark Theetge with Core and Main, a reputable vendor that routinely supplies pipe materials to Eastern Oregon projects. Hurricane Irma and Hurricane Harvey made landfall in Florida and Texas in the fall of 2017, putting an economic stress on petroleum and HDPE manufacturers, and continuing to impact HDPE pricing. Conservative cost estimates for pipe purchased in 2018 range from $1.25 to $1.30 per pound. A value of $1.27 per pound was used in this SIP. This value ($1.27) was used to cost the piping designed for EFID and indicates a conservative scenario at the time of preparation of this SIP.

For construction that is completed within two years of when this report is published, the cost estimates are considered reasonable, due to the addition of contingencies in the cost estimates. Phases that will be completed 2 years or more from the published date will require updated cost estimates. Furthermore, given the circumstances impacting HDPE pricing at this time, pricing could dramatically change over a one-year period or even less.

FCA estimated installation costs of the associated piping to be equivalent to the material cost of the pipe. This cost assumption includes the total cost of pipe installation (i.e. combining pipe material manufacturing, delivery and welding costs with trenching, pipe installation, and trench backfill costs).

3.2.1.2 Pressure Reducing Valve Stations

As indicated above, PRVs were utilized where necessary to ensure static pressures did not exceed a maximum of 100 psi per patron turnout. Cost estimates for PRVs were based on actual installed costs for comparable stations in Central Oregon. Cost estimates were developed assuming a PRV station would be required, as opposed to a single PRV, and would typically include the following components:

- electromagnetic flow meters
- pretreatment cartridge filters
- a piping manifold with a two to three PRVs in parallel to accommodate a range of flows
- combination air release/vacuum valves upstream and downstream of the PRV/piping manifold
- pressure relief valves upstream and downstream of the PRV/piping manifold
- a gate and ball valve associated with the PRV/piping manifold
- a concrete vault to house the PRV station

Table 3-1 provides the estimated PRV station costs that were used based on the nominal diameter of the PRV required.

TABLE 3-1. PRESSURE REDUCING VALVE STATION CAPITAL COST ESTIMATES.

PRV Nominal Diameter Range	***Estimated Capital Cost***
4 to 16 inches	$75,000
18 to 24 inches	$100,000
26 to 36 inches	$140,000
42 to 66 inches	$280,000

3.2.1.3 Turnouts

For the purposes of this SIP, patron turnouts were assumed to be converted to pressurized delivery systems. A standard pressurized irrigation delivery turnout was assumed to include an appropriately sized tee from the mainline or lateral, a pressure relief valve, a gear-actuated plug valve (or gate, or possibly a butterfly valve in smaller turnout situations), a magnetic meter, a combination air and vacuum relief valve, and spool-pipe segments. Based upon experience with similar installations at seven irrigation districts in Central Oregon, the cost of installation of a turnout was set at an estimated average cost of $8,000 per unit.

3.2.1.4 General Contractor Construction Management

Contractor procurement may come in several forms in Oregon. Design-Bid-Build is a conventional process wherein the survey and design are developed first, and then a traditional competitive bid is held to obtain the lowest-cost responsive and responsible bidding contractor. In this process, typically the design-engineering firm will serve as the inspection/construction management firm during construction. Given the magnitude of the project phases and for the purposes of this SIP, a Construction Manager General Contractor (CMGC) model was assumed. In this contractor procurement method, design would precede the construction contractor procurement process, but the contractor would be expected to include construction management in its scope and delivery of the constructed project. An estimated contractor fee structure of 14 percent was applied to the delivery system costs.

3.2.1.5 Engineering Construction Management

Engineering and Owner's Representative/Inspection services typically range as high as 10 to 18 percent of construction value. FCA assumed a fee of 10 percent for survey, engineering design, and inspection/owner's representative services would be appropriate.

3.2.1.6 Contingency

The Association for the Advancement of Cost Engineering (AACE) is a nationally recognized organization that has developed an accepted system of contingency ranges based upon project specificity Class level. There are five project Classes starting from Class 5 with only conceptual project definition to Class 1 where a project has been completely developed and bid. This SIP was considered to fall within the Class 4 definition. The AACE Class 4 project specificity level (i.e., a project at 1 to 15 percent definition) carries an anticipated contingency range of 15 to 30 percent below the actual cost to 20 to 50 percent above the actual cost. FCA selected a contingency value of 30 percent above the actual cost.

3.2.2 SEDIMENT MANAGEMENT AND FISH SCREENING COSTS

Screen cost estimates vary based on multiple factors such as site location, access to electrical power, access to the site, and available land for installation. The costs of screen improvements were broken into three categories: the purchase cost of the screen, concrete costs, and earthwork costs. These costs were estimated as a unit cost per cfs of water. Engineering and contingency costs were estimated as 8 and 5 percent, respectively, of the total screen costs.

Costs associated with proposed sediment management facilities were estimated based on the estimates completed by Wharry (2016).

3.2.3 HYDROELECTRIC PLANT COSTS

Specific details associated with the methodologies used to estimate the costs of hydroelectric plants are provided in the following section.

Section 4
Proposed System Improvements and Costs

4.1 SYSTEM IMPROVEMENT APPROACH

The primary objectives of the SIP are to determine water conservation potential, hydroelectric power generation potential, pump energy conservation, improvements to fish screening and passage, improvements to diversion water quality, and develop a mitigation strategy for system water losses. Although most of the District is piped, some of the piping is not pressurized and there are many overflows and end spills at various locations throughout the District; therefore, a completely piped and pressurized delivery system was identified to meet these objectives. Consistent with the Scope of Services summarized in Appendix A and direction provided by the District, FCA developed a comprehensive hydraulic model representing the delivery system as well as a piping and pressurization evaluation of the District.

In 2016, Mark Wharry, an engineer with KPFF Consulting Engineers, prepared the East Fork Irrigation District System Improvement Plan for EFID, which also outlined modernization projects for the District. The overall objectives and projects proposed by Wharry (2016) are similar to what is outlined in this SIP. However, FCA's objective in this SIP was to design a completely pressurized system, whereas most of the piping projects proposed by Wharry (2016) are not designed assuming the District will be entirely piped and pressurized in the future.

4.2 GENERAL ALTERNATIVE DESCRIPTIONS

Through the hydraulic modeling process two alternatives were identified as possible improvement options for EFID.

4.2.1 ALTERNATIVE A

Under Alternative A, the entire District delivery system would be fully piped and pressurized. To improve upon the District's current fish screening operations and ensure they are compliant with NMFS criteria, a horizontal, flat-plate fish and debris screen would be installed immediately downstream of the EFID point of diversion. The horizontal fixed-plate screen would also provide additional sediment removal. The Sand Trap would be used as a secondary sedimentation facility as necessary and used for fish acclimation by the Oregon Department of Fish and Wildlife (ODFW).

4.2.2 ALTERNATIVE B

Under Alternative B, most of the District delivery system would be piped and pressurized with a focus on enhancing sediment removal as much as possible. From the point of diversion to the Coanda Screen/Sand Trap, the approach canal would remain open and would be widened and several check dams would be installed to slow the flow and encourage sedimentation. A horizontal, fixed-plate screen would be installed in the same manner as described for Alternative A.

Similar to Alternative A, the Sand Trap would remain and provide additional sediment removal and acclimation when necessary. With the hope of removing some of the glacial silt and finer particles not removed by the horizontal fixed-plate screen and Sand Trap, a sedimentation basin as proposed by Wharry (2016) would be installed immediately downstream of the Sand Trap.

Figures 2 and 3 present an overview of the proposed improvements for Alternatives A and B, respectively. Table 4-1 summarizes the capital costs associated with Alternatives A and B.

TABLE 4-1. SUMMARY OF CAPITAL COSTS FOR ALTERNATIVES A AND B FOR EAST FORK IRRIGATION DISTRICT.

Improvement Item	***Improvement Costs***	
	Alternative A	**Alternative B**
Eastside	$18,164,000	$18,164,000
Main Canal	$29,040,000	$26,751,000
Central	$13,391,000	$13,391,000
Dukes Valley	$7,904,000	$7,904,000
Hydroelectric Facilities[1]	$8,200,000	$8,200,000
Fish Screening Improvements	$787,000	$787,000
Additional Sedimentation Management	N/A	$735,000
Total Costs	**$77,486,000**	**$75,932,000**

Notes:

- Costs were rounded to the nearest $1,000.
- N/A; Not Applicable, additional sedimentation management was not proposed for Alternative A.

1. Costs associated with hydroelectric facilities were initially estimated as a range; the high end of the range is presented.

4.3 DELIVERY SYSTEM IMPROVEMENTS

This section presents the proposed delivery system improvements and associated costs. The improvements have been combined into four general project groups based on the District's service areas: Main Canal Service Area, Central Lateral Service Area, Eastside Service Area, and Dukes Valley Service Area. Within each project group, the piping projects that the District wants to complete in the next 5 years are identified as high priority projects. Projects the district wants to complete in the next 5 to 10 years are identified as medium priority projects.

Piping projects that have been completed in the last 5 years are excluded from the cost estimates presented. FCA recommends, and the District agrees, that lateral pipelines should be replaced in conjunction with the canals that directly supply water to them. Costs associated with PRVs are presented for any piping projects that have been completed in the last 5 years and require PRVs once their supply canals are piped. Appendix E provides a detailed cost estimate, including the nominal diameters and pressure ratings, for the piping and PRV stations specified for each of the four District service areas.

4.3.1 EASTSIDE SERVICE AREA

Proposed HDPE piping in the Eastside Service Area will range in size from 4 to 42 inches. The proposed piping for Alternative A is the same as Alternative B for the Eastside Service Area. Table 4-2 presents the capital costs associated the high priority projects the District would like to complete for the Eastside Service Area. All other piping projects not included have been completed in the last 5 years or will be completed this year. Once Eastside Canal is converted to pressurized pipeline, PRVs will be required for many of the existing pipelines. Costs for those PRVs have been included.

To accommodate the pressure increases for six turnouts at the beginning of the Whiskey Creek Pipeline, which are followed by patrons at higher elevations and reduced pressures, the six turnouts have been placed on a lateral paralleling the pipeline. A PRV was placed on the lateral off the Whiskey Creek Pipeline to reduce the pressures allowing the downstream patrons at higher elevations to maintain adequate pressures.

Figure 4 presents the locations of the proposed projects as well as the PRVs that will be required once the Eastside Service Area is pressurized.

TABLE 4-2. CAPITAL COSTS FOR EAST FORK IRRIGATION DISTRICT EASTSIDE SERVICE AREA DELIVERY SYSTEM IMPROVEMENTS.

Pipeline Name	*Item[1]*	*Construction Costs*	*Engineering, Construction Management, Survey*	*General Management, General Contractor*	*Contingency Costs*	*Total Costs*
Eastside Canal	Pipe	$5,980,000	$598,000	$837,000	$2,224,000	$9,639,000
	Turnouts	$312,000	$31,000	$44,000	$116,000	$503,000
Crag Rat Pipeline	Pipe	$258,000	$26,000	$36,000	$96,000	$416,000
	Turnouts	$80,000	$8,000	$11,000	$30,000	$129,000
	PRV Stations	$225,000	$23,000	$32,000	$84,000	$364,000
Dethman/Swyers Line	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
Whiskey Creek Pipeline	Pipe	$924,000	$92,000	$129,000	$344,000	$1,489,000
	Turnouts	$184,000	$18,000	$26,000	$68,000	$296,000
	PRV Stations	$450,000	$45,000	$63,000	$167,000	$725,000
Kelly Pipeline	Pipe	$17,000	$2,000	$2,000	$6,000	$27,000
	Turnouts	$8,000	$1,000	$1,000	$3,000	$13,000
	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
Loop Pipeline	Pipe	$707,000	$71,000	$99,000	$263,000	$1,140,000
	Turnouts	$192,000	$19,000	$27,000	$71,000	$309,000
	PRV Stations	$150,000	$15,000	$21,000	$56,000	$242,000
Lower Highline Pressure Pipeline	Pipe	$180,000	$18,000	$25,000	$67,000	$290,000
	Turnouts	$136,000	$14,000	$19,000	$51,000	$220,000
	PRV Stations	$450,000	$45,000	$63,000	$167,000	$725,000
Paasch Pipeline	Pipe	$193,000	$19,000	$27,000	$72,000	$311,000
	Turnouts	$32,000	$3,000	$4,000	$12,000	$51,000
	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
Rasmussen Pipeline	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
Tallman Pipeline	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
Thomsen Pipeline	Pipe	$305,000	$31,000	$43,000	$113,000	$492,000

Pipeline Name	*Item[1]*	*Construction Costs*	*Engineering, Construction Management, Survey*	*General Management, General Contractor*	*Contingency Costs*	*Total Costs*
	Turnouts	$32,000	$3,000	$4,000	$12,000	$51,000
	PRV Stations	$75,000	$8,000	$11,000	$28,000	$122,000
	Total:	**$11,265,000**	**$1,130,000**	**$1,579,000**	**$4,190,000**	**$18,164,000**

Notes:

- Costs were rounded to the nearest $1,000.

1. Specific quantities, diameters, and pressure ratings associated with the piping, turnouts, and PRV stations are included in Appendix E.

4.3.2 MAIN CANAL SERVICE AREA

4.3.2.1 Alternative A

Under Alternative A, the Main Canal will be converted to a 48-inch and 54-inch dual HDPE pipeline from the headworks to the Distribution Center. The District requested a dual pipeline so the low flows associated with spray water could be conveyed at adequate velocities. One steel 66-inch pipeline was initially considered, but the costs were comparable and steel is not expected to last as long as the dual HDPE pipeline, as discussed in section 3.1.5. Table 4-3 presents the Alternative A capital costs associated with medium priority piping projects the District would like to complete for the Main Canal Service Area.

Laterals off the Main Canal would be converted to HDPE piping ranging in size from 4 to 6 inches. The Christopher Pipeline has recently been replaced and has not been included in cost estimates, but FCA does recommend that the existing energy dissipaters and water boxes be replaced on the Christopher Pipeline. Figure 5 presents the locations of the proposed projects under Alternative A as well as the PRVs that will be required once the Main Canal Service Area is pressurized. The District would like to only replace a portion of the Bowcut Pipeline, but FCA has included pricing for entire pipeline.

TABLE 4-3. ALTERNATIVE A CAPITAL COSTS FOR EAST FORK IRRIGATION DISTRICT MAIN CANAL SERVICE AREA DELIVERY SYSTEM IMPROVEMENT.

Pipeline Name	Item[1]	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Medium Priority (5 to 10 years)						
Main Canal	Pipe	$17,011,000	$1,701,000	$2,382,000	$6,328,000	$27,422,000
	Turnout	$392,000	$39,000	$55,000	$146,000	$632,000
	PRV Station	$280,000	$28,000	$39,000	$104,000	$451,000
Arens Lateral Pipeline	Pipe	$6,000	$1,000	$1,000	$2,000	$10,000
	Turnout	$16,000	$2,000	$2,000	$6,000	$26,000
Bowcut Pipeline	Pipe	$30,000	$3,000	$4,000	$11,000	$48,000
	Turnout	$128,000	$13,000	$18,000	$48,000	$207,000
Christopher Pipeline	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
Fisher Pipeline	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
	Total:	**$18,013,000**	**$1,803,000**	**$2,523,000**	**$6,701,000**	**$29,040,000**

Notes:

- Costs were rounded to the nearest $1,000.

1. Specific quantities, diameters, and pressure ratings associated with the piping, turnouts, and PRV stations are included in Appendix E.

4.3.2.2 Alternative B

The majority of the proposals listed in section 4.3.2.1 apply to Alternative B. The underlying difference is that piping will begin at the Coanda Screen/Sand Trap. Table 4-4 presents the Alternative B capital costs associated with medium priority piping projects. Figure 6 presents the locations of the proposed projects under Alternative B for the Main Canal.

TABLE 4-4. ALTERNATIVE B CAPITAL COSTS FOR EAST FORK IRRIGATION DISTRICT MAIN CANAL SERVICE AREA DELIVERY SYSTEM IMPROVEMENTS.

Pipeline Name	***Item[1]***	***Construction Costs***	***Engineering, Construction Management, Survey***	***General Management, General Contractor***	***Contingency Costs***	***Total Costs***
Medium Priority (5 to 10 years)						
Main Canal	Pipe	$15,591,000	$1,559,000	$2,183,000	$5,800,000	$25,133,000
	Turnout	$392,000	$39,000	$55,000	$146,000	$632,000
	PRV Station	$280,000	$28,000	$39,000	$104,000	$451,000
Arens Lateral Pipeline	Pipe	$6,000	$1,000	$1,000	$2,000	$10,000
	Turnout	$16,000	$2,000	$2,000	$6,000	$26,000
Bowcut Pipeline	Pipe	$30,000	$3,000	$4,000	$11,000	$48,000
	Turnout	$128,000	$13,000	$18,000	$48,000	$207,000
Christopher Pipeline	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
Fisher Pipeline	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
	Total:	**$16,593,000**	**$1,661,000**	**$2,324,000**	**$6,173,000**	**$26,751,000**

Notes:

- Costs were rounded to the nearest $1,000.

1. Specific quantities, diameters, and pressure ratings associated with the piping, turnouts, and PRV stations are included in Appendix E.

4.3.3 CENTRAL SERVICE AREA

Proposed HDPE piping in the Central Service Area will range in size from 4 to 36 inches. The proposed piping for Alternative A is the same as Alternative B for the Central Service Area. Table 4-5 presents the capital costs associated the high priority and medium priority projects the District would like to complete for this service area. All other piping projects not included have been completed in the last 5 years or will be completed this year. Although FCA does not recommend replacing the piping on the CLP, replacement of the existing energy dissipaters with PRVs is recommended and those costs are included. When modeling the existing configuration of the CLP, velocities as high as 8 fps were observed in the coated-steel pipeline portion. Given the high velocities observed, FCA does recommend the coated-steel section be replaced sooner rather than later. Figure 7 presents the locations of the proposed projects as well as the PRVs that will be required once the Central Service Area is pressurized.

TABLE 4-5. CAPITAL COSTS FOR EAST FORK IRRIGATION DISTRICT CENTRAL SERVICE AREA DELIVERY SYSTEM IMPROVEMENTS.

Pipeline Name	Item[1]	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
High Priority (next 5 years)						
Central Lateral Pipeline	PRV Station	$495,000	$50,000	$69,000	$184,000	$798,000
Allison Pipeline	Pipe	$174,000	$17,000	$24,000	$65,000	$280,000
	Turnout	$64,000	$6,000	$9,000	$24,000	$103,000
	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
Dethman Ridge Line[2]	Pipe	$1,584,000	$158,000	$222,000	$589,000	$2,553,000
	Turnout	$592,000	$59,000	$83,000	$220,000	$954,000
	PRV Station	$325,000	$33,000	$46,000	$121,000	$525,000
Oanna Pipeline[3]	Pipe	$1,966,000	$197,000	$275,000	$731,000	$3,169,000
	Turnout	$224,000	$22,000	$31,000	$83,000	$360,000
	PRV Station	$655,000	$66,000	$92,000	$244,000	$1,057,000
	Subtotal:	**$6,154,000**	**$616,000**	**$862,000**	**$2,289,000**	**$9,921,000**
Medium Priority (5 to 10 years)						
Chipping Pipeline	Pipe	$992,000	$99,000	$139,000	$369,000	$1,599,000
	Turnout	$160,000	$16,000	$22,000	$60,000	$258,000
	PRV Station	$325,000	$33,000	$46,000	$121,000	$525,000
Gilkerson Pipeline	Pipe	$188,000	$19,000	$26,000	$70,000	$303,000
	Turnout	$40,000	$4,000	$6,000	$15,000	$65,000
	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
Winklebleck Pipeline	Pipe	$105,000	$10,000	$15,000	$39,000	$169,000
	Turnout	$40,000	$4,000	$6,000	$15,000	$65,000
	PRV Station	$225,000	$23,000	$32,000	$84,000	$364,000
	Subtotal:	**$2,150,000**	**$216,000**	**$303,000**	**$801,000**	**$3,470,000**
	Total:	**$8,304,000**	**$832,000**	**$1,165,000**	**$3,090,000**	**$13,391,000**

Notes:

- Costs were rounded to the nearest $1,000.

1. Specific quantities, diameters, and pressure ratings associated with the piping, turnouts, and PRV stations are included in Appendix E.

2. Dethman Ridge Line is a continuation of the Oanna Pipeline and includes the following sub-laterals in the costs presented: Neal Mill Pipeline, Lentz Butte Pipeline, and the Webster Pressure Pipeline.
3. The costs presented for the Oanna Pipeline include the following sub-laterals: Yasui Pipeline, Nunamaker Pipeline, and the Neufeldt Pipeline.

4.3.4 DUKES VALLEY SERVICE AREA

Proposed HDPE piping in the Dukes Valley Service Area will range in size from 4 to 36 inches. The proposed piping for Alternative A is the same as Alternative B for the Dukes Valley Service Area. Table 4-6 presents the capital costs associated the high priority and medium priority projects the District would like to complete for this service area. All other piping projects not included have been completed in the last 5 years or will be completed this year. Figure 8 presents the locations of the proposed projects as well as the PRVs that will be required once the Dukes Valley Service Area is pressurized.

TABLE 4-6. CAPITAL COSTS FOR EAST FORK IRRIGATION DISTRICT DUKES VALLEY SERVICE AREA DELIVERY SYSTEM IMPROVEMENTS.

Pipeline Name	***Item*[1]**	***Construction Costs***	***Engineering, Construction Management, Survey***	***General Management, General Contractor***	***Contingency Costs***	***Total Costs***
Medium Priority (5 to 10 years)						
Dukes Valley Canal	Pipe	$2,108,000	$211,000	$295,000	$784,000	$3,398,000
	Turnout	$176,000	$18,000	$25,000	$65,000	$284,000
	PRV Station	$215,000	$22,000	$30,000	$80,000	$347,000
Cameron Hill Pipeline	PRV Station	$225,000	$23,000	$32,000	$84,000	$364,000
Marsh/Chamberlin Pipeline[2]	Pipe	$1,039,000	$104,000	$145,000	$386,000	$1,674,000
	Turnout	$504,000	$50,000	$71,000	$187,000	$812,000
	PRV Station	$325,000	$33,000	$46,000	$121,000	$525,000
Shute Road Pipeline[3]	PRV Station	$150,000	$15,000	$21,000	$56,000	$242,000
Sheirbon Hill Pipeline	Pipe	$36,000	$4,000	$5,000	$13,000	$58,000
	Turnout	$48,000	$5,000	$7,000	$18,000	$78,000
	PRV Station	$75,000	$8,000	$11,000	$28,000	$122,000
	Total:	**$4,901,000**	**$493,000**	**$688,000**	**$1,822,000**	**$7,904,000**

Notes:

- Costs were rounded to the nearest $1,000.

1. Specific quantities, diameters, and pressure ratings associated with the piping, turnouts, and PRV stations are included in Appendix E.
2. The costs presented for the Marsh/Chamberlin Pipeline include the following sub-laterals: Sweet Pipeline, Rock Acres Pipeline, Poole Pipeline, and Chamberlin Pressure Pipeline.
3. The costs presented for the Shute Road Pipeline include the Chamberlin Overflow Pipeline.

4.4 ENERGY IMPROVEMENTS

The improvements proposed in this SIP would utilize the potential energy of the water delivery system in the following two ways:

- Enhancing on-farm energy conservation by providing pressurized deliveries that can offset or eliminate pumping costs.
- Providing hydroelectric energy generation potential through pressurized pipelines.

4.4.1 ON-FARM ENERGY CONSERVATION

Dynamic pressures resulting from elevation differential in a piped network, can be repurposed by the users on the line, offsetting or eliminating their pumping requirements. Since pull off the system at different locations and elevations varies, the useable pressure by each individual also varies, as indicated by the hydraulic model. Dynamic pressure is the actual pressure experienced after accounting for friction loss in the pipes. The highest friction loss occurs when the system is at maximum capacity with all users turned on. To calculate the energy conservation potential of a piped system, this analysis was completed as if every user was turned on. Irrigation flow will not always be at peak flow; therefore, system pressurization will likely be greater than the pressures estimated in the model due to the variability of system operations. Accordingly, analyses contained herein essentially outline the highest energy loss scenarios so as not to overstate project outcomes.

To estimate the on-farm energy consumption, on-farm water use needs to be quantified. The on-farm water use evaluation completed by Christensen (2013a) was used, as discussed in section 2.2.4. The sprinkler survey Christensen (2013a) completed for EFID is summarized in Table 4-7. A weighted average sprinkler efficiency of 2.09 feet per year was estimated based on the types of sprinklers used in EFID and the corresponding percentage of EFID's irrigated acres that is used for each type of sprinkler.

TABLE 4-7. EAST FORK IRRIGATION DISTRICT SURVEY OF ON-FARM IRRIGATION SYSTEMS.

Irrigation System Type	EFID Acreage (%)	Efficiency (ft/yr)
Wheel Line	4	3
Hand Line	31	2.39
Solid Set	28	2.39
Rotator	12	1.53
Micro	23	1.53
Drip	2	1.4
	Weighted Average Use:	**2.09**

Notes:
Source: Christensen 2013a

The following assumptions were used to estimate private patron (on-farm) energy requirements:

- An assumed sprinkler efficiency of 2.09 feet per year - the sprinkler efficiency reflects the actual on-farm water use; therefore, application efficiency of the emitters was not necessary to calculate the actual water use
- An irrigation season of 170 days from April 15 to September 30
- A minimum pressure of 40 psi to eliminate pumping requirements

Where the model calculated pressures exceeding 40 psi for individual patrons, 40 psi was used as a conservative estimate to quantify reduction in energy consumption by individual patrons. For patrons where partial pressurization, i.e., pressures less than 40 psi, was anticipated by the hydraulic model, a proportionate fraction of energy savings was applied. Some of the irrigation system segments are already piped, but the additional pressure realized from comprehensive system piping will further benefit District patrons by greatly reducing, if not eliminating, pump energy demand and expenses. FCA placed PRVs and applied PRV settings to ensure pressures would be comparable or better for patrons on existing piped laterals. FCA assumes the pressures patrons experience in the existing system and actual pressures may deviate from these estimates; therefore, the placement and settings of PRVs should be reevaluated when a detailed design is completed for each lateral.

4.4.1.1 Eastside Service Area

FCA estimated annual private patron energy savings through pump energy mitigation for the Eastside Service Area to be 614,911 kilowatt-hours (kWh) per year. This is broken down by pipeline in Table 4-8.

TABLE 4-8. EASTSIDE SERVICE AREA ESTIMATED ON-FARM ENERGY SAVINGS.

Pipeline	Annual Existing Pump Energy (kWh)	Proposed Annual Pump Energy (kWh)	Pump Energy Conservation (kWh)
Crag Rat Pipeline	30,182	-	30,182
Dethman/Swyers Line	41,576	1,163	40,413
Eastside Canal	271,276	-	271,276
Ehrentraut Pipeline	287	-	287
Kelly Pipeline	-	-	-
Loop Pipeline	94,833	-	94,833
Lower Highline Pressure Pipeline	22,528	2,488	20,040
Mathieson Pipeline	487	-	487
Paasch Pipeline	3,088	3,088	-
Rasmussen Pipeline	56,556	-	56,556
Tallman Pipeline	-	-	-
Thomsen Pipeline	39,145	-	39,145
Whiskey Creek Pipeline	69,843	8,151	61,692
Total:	**629,801**	**14,890**	**614,911**

4.4.1.2 Main Canal Service Area

FCA estimated on-farm energy conservation for the Main Canal Service Area under Alternative A to be 99,867 kWh as shown in Table 4-9.

TABLE 4-9. MAIN CANAL SERVICE AREA ESTIMATED ON-FARM ENERGY SAVINGS FOR ALTERNATIVE A.

Pipeline	Annual Existing Pump Energy (kWh)	Proposed Annual Pump Energy (kWh)	Pump Energy Conservation (kWh)
Arens Lateral Pipeline	10,095	2,103	7,992
Bailey/Luse/Schultz Pipeline	1,318	433	885
Bowcut Pipeline	17,946	8,021	9,925
Christopher Pipeline	28,310	7,633	20,677
Fisher Pipeline	-	-	-
Main Canal	76,679	24,064	52,615
Neal Creek Pipeline	7,773	-	7,773
Total:	**142,121**	**42,254**	**99,867**

FCA estimated on-farm energy conservation for the Main Canal Service Area under Alternative B to be 22,989 kWh as shown in Table 4-10. The reduction in energy conservation for Alternative B, as compared to Alternative A, is due to the reduced energy conservation potential in the Main Canal. Under Alternative B, pressurization will begin approximately 50 feet lower in elevation as compared to Alternative A, which translated to lower pressures in the Main Canal

TABLE 4-10. MAIN CANAL SERVICE AREA ESTIMATED ON-FARM ENERGY SAVINGS FOR ALTERNATIVE B.

Pipeline	Annual Existing Pump Energy (kWh)	Proposed Annual Pump Energy (kWh)	Pump Energy Conservation (kWh)
Arens Lateral Pipeline	10,095	8,881	1,214
Bailey/Luse/Schultz Pipeline	1,318	1,161	157
Bowcut Pipeline	17,946	16,464	1,482
Christopher Pipeline	28,310	24,446	3,864
Fisher Pipeline	-	-	-
Main Canal	76,679	65,300	11,379
Neal Creek Pipeline	7,773	2,880	4,893
Total:	**142,121**	**119,132**	**22,989**

4.4.1.3 Central Service Area

FCA estimated annual private patron energy savings through pump energy mitigation for the Central Service Area to be 301,754 kWh per year. This is broken down by pipeline in Table 4-11.

TABLE 4-11. CENTRAL SERVICE AREA ESTIMATED ON-FARM ENERGY SAVINGS.

Pipeline	Annual Existing Pump Energy (kWh)	Proposed Annual Pump Energy (kWh)	Pump Energy Conservation (kWh)
Allison Pipeline	219	-	219
Bietler Pipeline	-	-	-
Central Lateral Pipeline	133,642	62,334	71,308
Chipping Pipeline	56,599	2,394	54,205
Denton Pipeline	-	-	-
Dethman Ridge Line	155,519	18,689	136,830
Eastside Auxillary Pipeline	-	-	-
Gilkerson Pipeline	1,943	944	999
Oanna Pipeline	44,600	6,407	38,193
Peters Diversion Pipeline	-	-	-
Sherrard Road Pipeline	-	-	-
Winklebleck Pipeline	-	-	-
Total:	**392,522**	**90,768**	**301,754**

4.4.1.4 Dukes Valley Service Area

FCA estimated annual private patron energy savings through pump energy mitigation for the Dukes Valley Service Area to be 230,052 kWh per year. This is broken down by pipeline in Table 4-12.

TABLE 4-12. DUKES VALLEY SERVICE AREA ESTIMATED ON-FARM ENERGY SAVINGS.

Pipeline	Annual Existing Pump Energy (kWh)	Proposed Annual Pump Energy (kWh)	Pump Energy Conservation (kWh)
Ackerman Hill Pipeline	59,246	1,432	57,814
Cameron Hill Pipeline	8,341	4,170	4,171
Cherry Hill Pipeline	-	-	-
Dukes Valley Canal	79,150	3,437	75,713
Highline Pipeline	58,789	35,116	23,673
Marsh/Chamberlin Pipeline	60,134	1,004	59,130
Sheirbon Hill Pipeline	573	1	572
Shute Road Pipeline	14,258	5,279	8,979
Total:	**280,491**	**50,439**	**230,052**

4.4.2 HYDROELECTRIC ENERGY GENERATION

The hydraulic analysis of the District indicates that there are multiple locations where in-conduit hydroelectric energy is viable by harnessing excess energy not needed to provide pressurized deliveries. NLine Energy, Inc. (NLine) completed a hydroelectric energy potential assessment for 20 different locations throughout the District's delivery system. Of the 20 sites initially considered, six locations were identified for a more in-depth preliminary feasibility assessment. To complete a feasibility assessment and ultimately assess the viability of a proposed site, NLine used the following criteria:

- The eligibility of the proposed location
- The availability of data related to flows and topographical information or surveys associated with the proposed location
- The hydraulic profile of the location, including the expected irrigation demands over the irrigation season, the total dynamic head, and residual pressure requirements of downstream patrons
- The availability of a hydroelectric technology
- The capital costs associated with the construction of a new power house facility, contingencies, interconnection, the turbine technology, and environmental compliance
- The limitations imposed by the District's water rights, applicable environmental regulations, and permitting and licensing requirements
- The power monetization opportunity as compared to the expected annual costs (i.e., wheeling charges, operation and maintenance costs, and debt service)

Of the six locations NLine evaluated in their preliminary assessments, two locations were recommended for further evaluation: along the Central Lateral Pipeline near the Sherrard Road Lateral - Site 1B, and the Central Lateral Pipeline near Neal Creek - Site 1C, as summarized in Table 4-13 and shown in Figure 2. NLine estimated a power rating of 1,150 and 1,500 kW, and an estimated energy generation potential of 4,500,000 and 5,500,000 kWh, for Sites 1B and 1C respectively. The detailed preliminary assessments associated with each of the six locations are provided in Appendix F. NLine's assessment was completed prior to the hydraulic modeling analysis; therefore, FCA recommends additional analyses be completed to reassess the expected flows through the two recommend locations and the micro-hydroelectric energy generation potential associated with the 63 proposed PRVs.

TABLE 4-13. PRELIMINARY ASSESSMENT OF POSSIBLE IN-CONDUIT HYDROELECTRIC FACILITIES IN EAST FORK IRRIGATION DISTRICT.

Site #	***Facility***	***kW rating***	***Annual Generation (kWh)***	***Estimated Pricing (Avg. $-kWh)***	***Est. Project Costs (USD)***	***Simple Payback (yrs)***	***Recommendation***
1A	EFID - Central Lateral - Neal Creek - (Site A)	760	2,900,000	$0.0880	$3M - $3.9M	18 to 22	**Unknown**
1B	EFID - Central Lateral - Neal Creek - Sherrard Road (Site B)	1,150	4,500,000	$0.0880	$3.2M - $4M	14 to 17	**Go**
1C	EFID - Central Lateral - Neal Creek (Site C)	1,500	5,500,000	$0.0880	$3.4M - $4.2M	13 to 16	**Go**
2	EFID - Dukes Valley Lateral - Odell Creek Site	650	2,600,000	$0.0880	$2.9M - $3.8M	18 to 22	**Unknown**
3	EFID - Main Canal - Toll Bridge	180	600,000	$0.0880	$1.9M to $2.4M	30+	**No-Go**
4	EFID - Main Canal - Tavern Chute (Distribution Screen)	285	850,000	$0.0880	$1.8M - $2.3M	28 to 32	**No-Go**

Notes:
Source: NLine Energy Inc. 2017

4.5 FISH SCREENING AND SEDIMENT MANAGEMENT IMPROVEMENTS

To improve upon current EFID fish screening operations, FCA recommends a horizontal fixed-plate fish screen to replace the existing Coanda screen. The only horizontal fixed-plate fish screen that meets NMFS published criteria is the Farmers Conservation Alliance Farmers Screen; therefore, the Farmers Screen is recommended. To accommodate a wide range of flows, the proposed Farmers Screen would be a dual screen with a flow capacity of 90 cfs on one side and 30 cfs on the other side, for total of 120 cfs when both sides are operating. When flows drop to 30 cfs and below, the 90 cfs side would be shut off so only the 30 cfs side would be operating. This method of operation would be used to ensure an adequate sweeping velocity to keep the screen free of debris.

The Farmers Screen would be placed approximately 100 feet downstream of the headworks to ensure an adequate length for an entrance flume onto the Farmers Screen. The placement of the Farmers Screen would eliminate the mortality risk for fish and other aquatic life in the approach canal as discussed in section 2.2. Given the high sediment load the EFHR can experience, a sediment flushing system will also be included with the screen. The Farmers Screen's sediment flushing system is expected to significantly reduce the cost, labor, and equipment required to remove sediment with the Sand Trap and approach canal. Figure 9 provides a plan view of the approximate placement of the Farmers Screen, entrance flume, and bypass pipe back to the EFHR, and identifies the screen components.

Under Alternative A, the approach canal from the headworks to the entrance of the inlet flume for the dual screen would be piped. Screened water would be discharged into a piped delivery system. At the two ends of the dual screen, bypassed water for fish would discharge over a common "v" shaped flume and transition into a smooth-wall pipe, which would discharge back into the EFHR. Under Alternative B, the approach canal would remain unpiped upstream and downstream from the Farmers Screen, but all other components of the screen would remain the same.

As well as improving fish screening at EFID, the Farmers Screen would also provide sediment reduction over and above the Sand Trap. Experimental analyses haven't been completed to confirm the concentrations of sediment the Farmers Screen can settle and remove from diverted water. However, a Farmers Screen installed on the Coe Creek Diversion for Middle Fork Irrigation District, which is also laden with glacial sediment and silt, has successfully reduced sediment in diverted water with turbidity concentrations, on average, higher than EFID's diverted water (i.e., 225 NTUs (Christensen 2013a)).

Under Alternative A, the Farmers Screen and the Sand Trap would be the primary sedimentation facilities. Under Alternative B, a sedimentation basin would be installed immediately downstream of the Sand Trap for additional sediment settling as proposed by Wharry (2016), which would be 300 feet in length and 100 feet wide. Christensen (2013a) evaluated various sizes of sedimentation facilities and estimated the fractions of sediment that could be removed based on particle-size distribution. Based on Christensen's (2013a) calculations, where he assumed the particle-size distribution of EFID's water is similar to what is presented in Table 2-2, a 100-feet by 100-feet facility and a 300-feet by 300-feet facility would settle at least 29.8 percent and 47.3 percent of particles, respectively. Therefore, the sedimentation facility proposed by Wharry (2016) would be expected to settle at least 29.8 percent and potentially as much as 47.3 percent.

Table 4-14 presents the estimated capital costs for the dual Farmers Screen. The cost of additional sediment management with the sediment settling basin proposed by Wharry (2016) is approximately $735,000 in 2018 dollars.

TABLE 4-14. CAPITAL COSTS FOR THE PROPOSED DUAL FARMERS SCREEN FOR EAST FORK IRRIGATION DISTRICT.

Item	Unit Cost ($/Unit)	Unit	Quantity	Subtotal	Engineering	Contingency	Total
Screen Cost	3000	CFS	120	$360,000	$29,000	$18,000	$407,000
Concrete Cost	1800	CFS	120	$216,000	$17,000	$11,000	$244,000
Earthwork Costs	1000	CFS	120	$120,000	$10,000	$6,000	$136,000
			Total:	**$696,000**	**$56,000**	**$35,000**	**$787,000**

4.6 WATER CONSERVATION

Table 4-15 presents the estimated water conservation associated with piping and pressurizing the District under Alternatives A and B. The assessed irrigated lands of 9,596 acres, as shown in Table 2-3, were used to estimate the future diversion flow rate at the District's delivery rate of 4.49 gpm/acre as compared to the maximum historical diverted flow from 2001 to 2017 corrected to exclude MHID flows. The water conservation estimate is expected to be similar for both alternatives, given that all remaining overflows will be eliminated in either alternative, and only a small section of the main canal would remain open in Alternative B.

TABLE 4-15. ESTIMATED WATER CONSERVATION ASSOCIATED WITH PROPOSED IMPROVEMENTS FOR EAST FORK IRRIGATION DISTRICT.

Assessed Irrigated Lands (ac)	Maximum Measured Diversion Flow from 2001-2017 (cfs)	Corrected Maximum Diversion[1] Flow (cfs)	Diversion Flow Rate at 4.49 gpm/acre (cfs)	Potential Water Conservation (cfs)
9,596	124.00	117.67	96.17	21.50

Notes:
1. Corrected Maximum Diversion Flow excludes 50 percent of MHID allocated flows of 12.65 cfs.

The potential water conservation of 21.5 cfs is comparable to the average measured overflows of 16.6 cfs presented in Table 2-6. Given that the measured overflows are similar to the water conservation estimate, FCA recommends using measured losses to approximate the potential for water conservation in the District. The measured losses should be verified prior to any water conservation transfers associated with piping.

Section 5
Recommendations and Future Actions

The Modernization Strategy (MS) is the next phase in the Irrigation Modernization Program and will examine the impacts and benefits of irrigation modernization along with strategies to fund and implement the improvements proposed in this SIP. As part of MS process, phasing associated with this project will be reviewed in greater detail.

Based on the evaluations completed for this System Improvement Plan the following conclusions and recommendations can be made:

- When comparing Alternatives A and B, FCA recommends proceeding with Alternative B. Alternative B is a more cost effective option and will maximize the District's ability to improve its irrigation water quality.
- As the District proceeds with the proposed improvements for each piping project, updated cost estimates should be obtained given the volatile pricing of HDPE.
- A more in-depth assessment of the hydroelectric energy potential is recommended for the locations NLine proposed, especially with respect to expected flow, as well as the possible micro-hydroelectric energy potential associated with the 63 PRVs that were identified in the modernized system.
- The measured average overflow in the District of 16.6 cfs is comparable to the estimated 21.5 cfs of water conservation potential associated with piping and pressurizing the District; therefore, FCA recommends using the measured losses to approximate conservation potential. However, the measured overflows should be verified prior to any water conservation transfers associated with piping.

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Figures

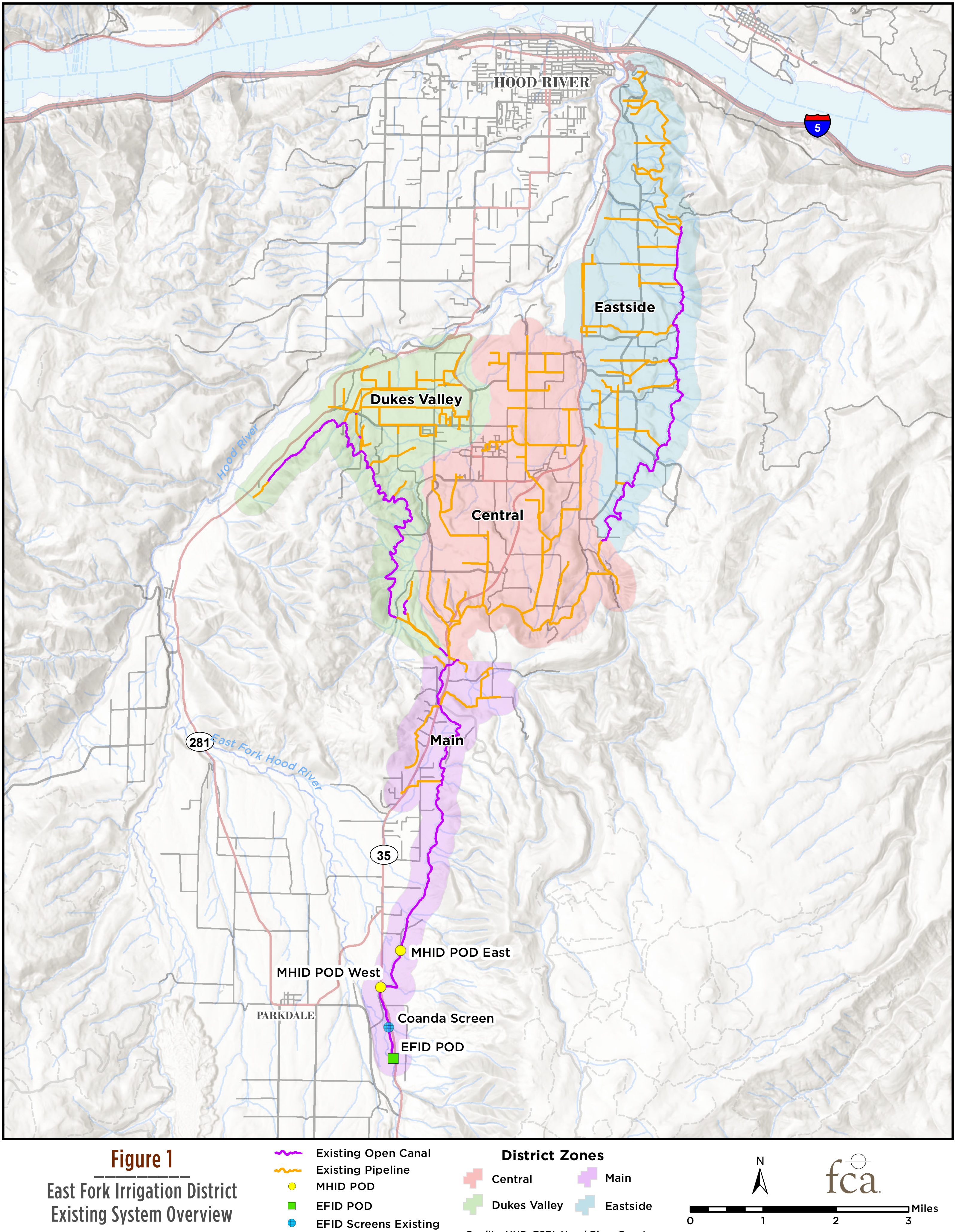

Figure 1

East Fork Irrigation District
Existing System Overview

Credits: NHD, ESRI, Hood River County

*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein. ***

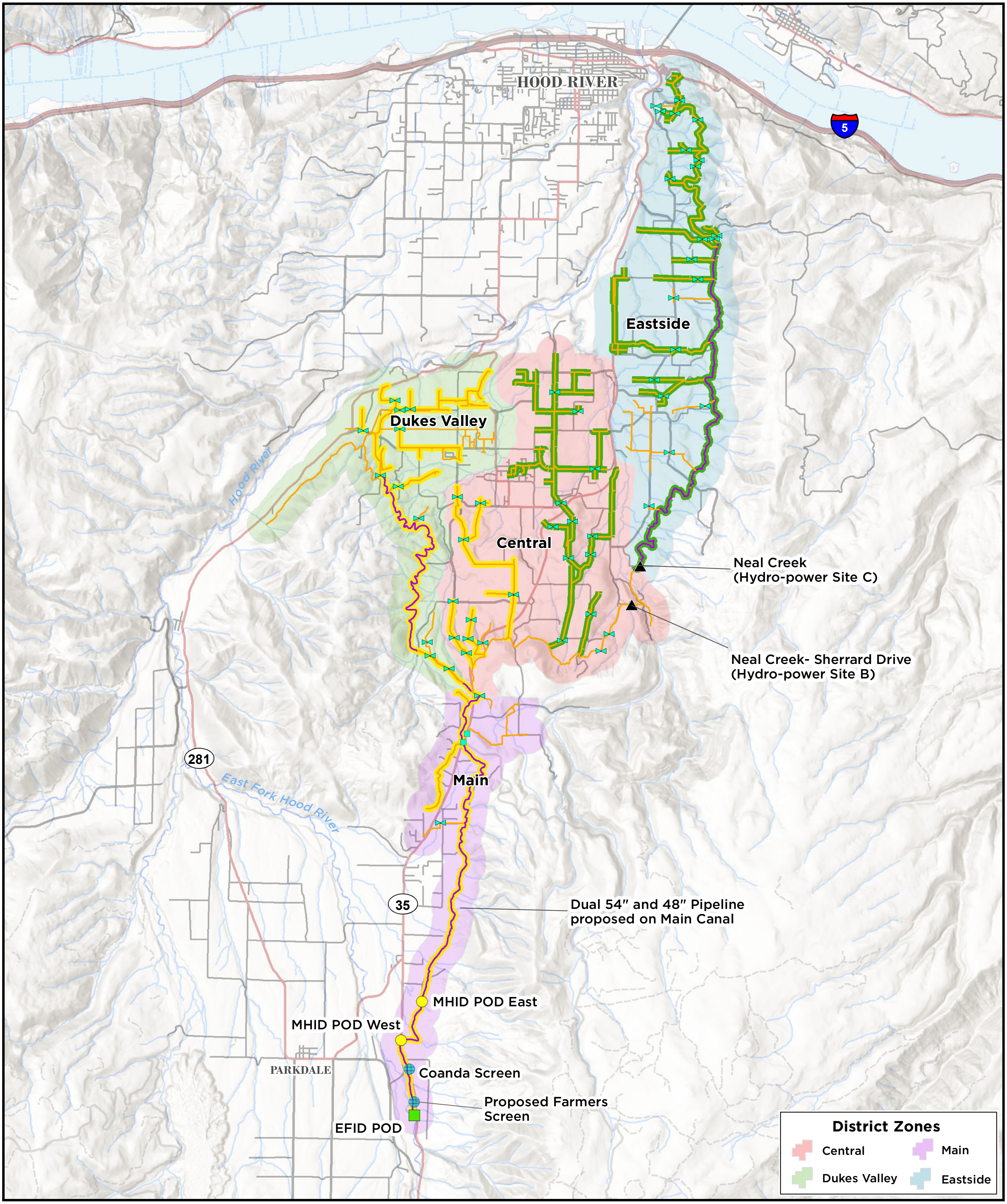

Figure 2

East Fork Irrigation District
Alternative A
Overview

- Existing Open Canal - To Be Replaced - 5 yrs
- Existing Pipeline - To Be Replaced - 5 yrs
- Existing Open Canal - To Be Replaced - 5-10 yrs.
- Existing Pipeline - To Be Replaced - 5-10 yrs
- Existing Open Canal - To Remain
- Existing Pipeline - To Remain
- Proposed Hydro-Power Site
- Proposed Pressure Reducing Valve
- EFID Screens Proposed & Existing
- Existing Energy Dissipators
- EFID POD
- MHID POD

N

0 0.5 1 2 Miles

fca

Credits: NHD, ESRI, Hood River County, EFID

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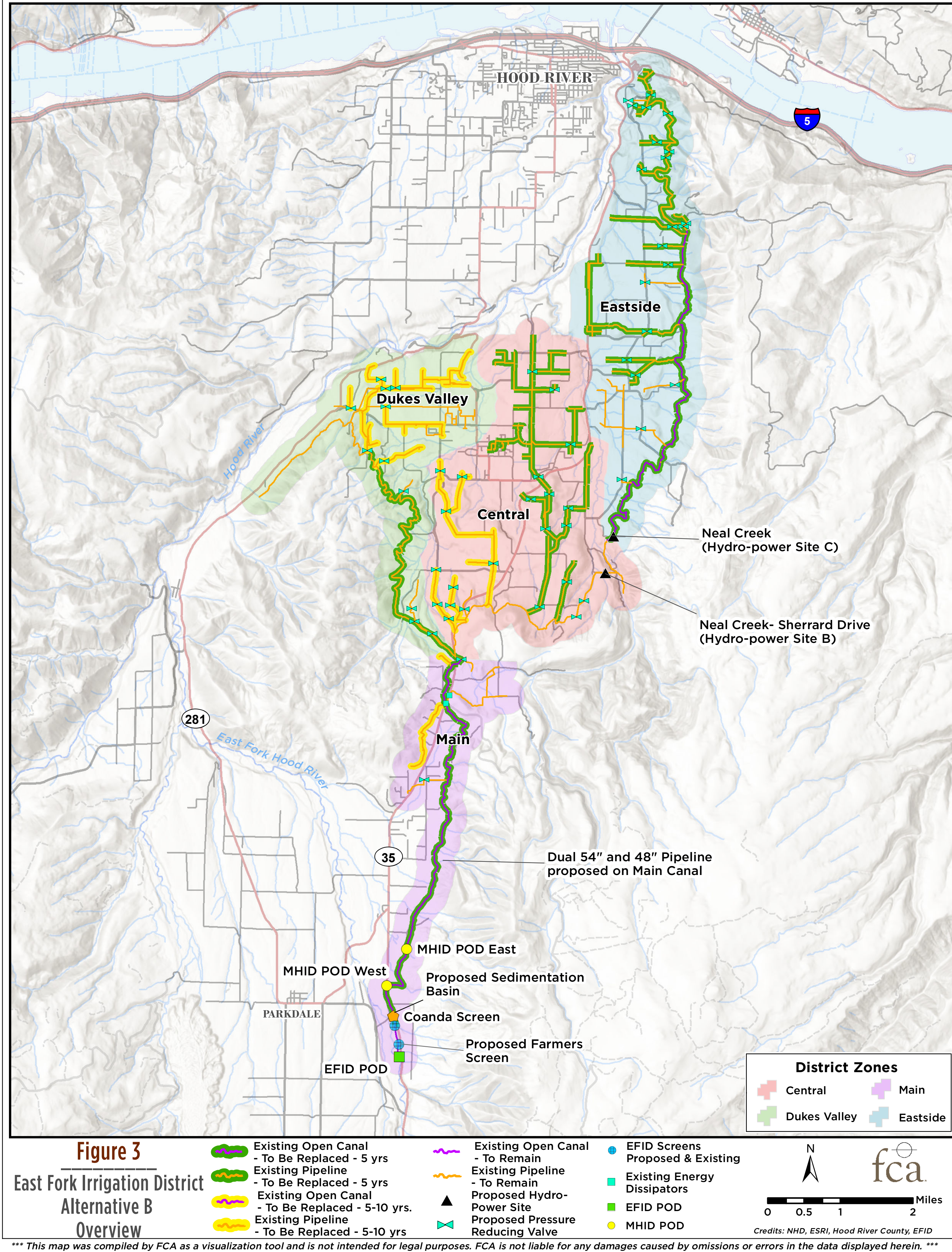

Figure 3

East Fork Irrigation District
Alternative B
Overview

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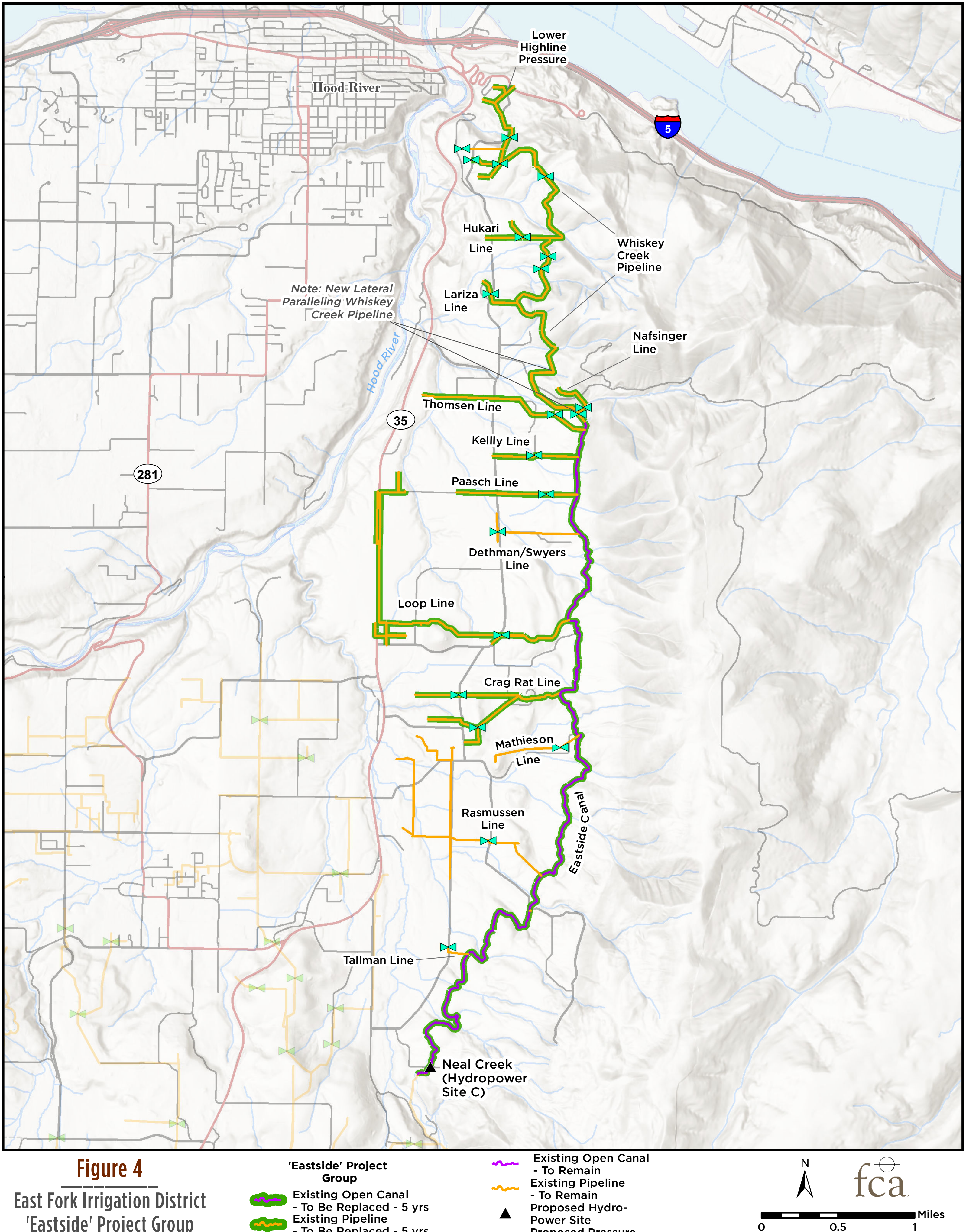

Figure 4

East Fork Irrigation District 'Eastside' Project Group

Credits: NHD, ESRI, Hood River County, EFID

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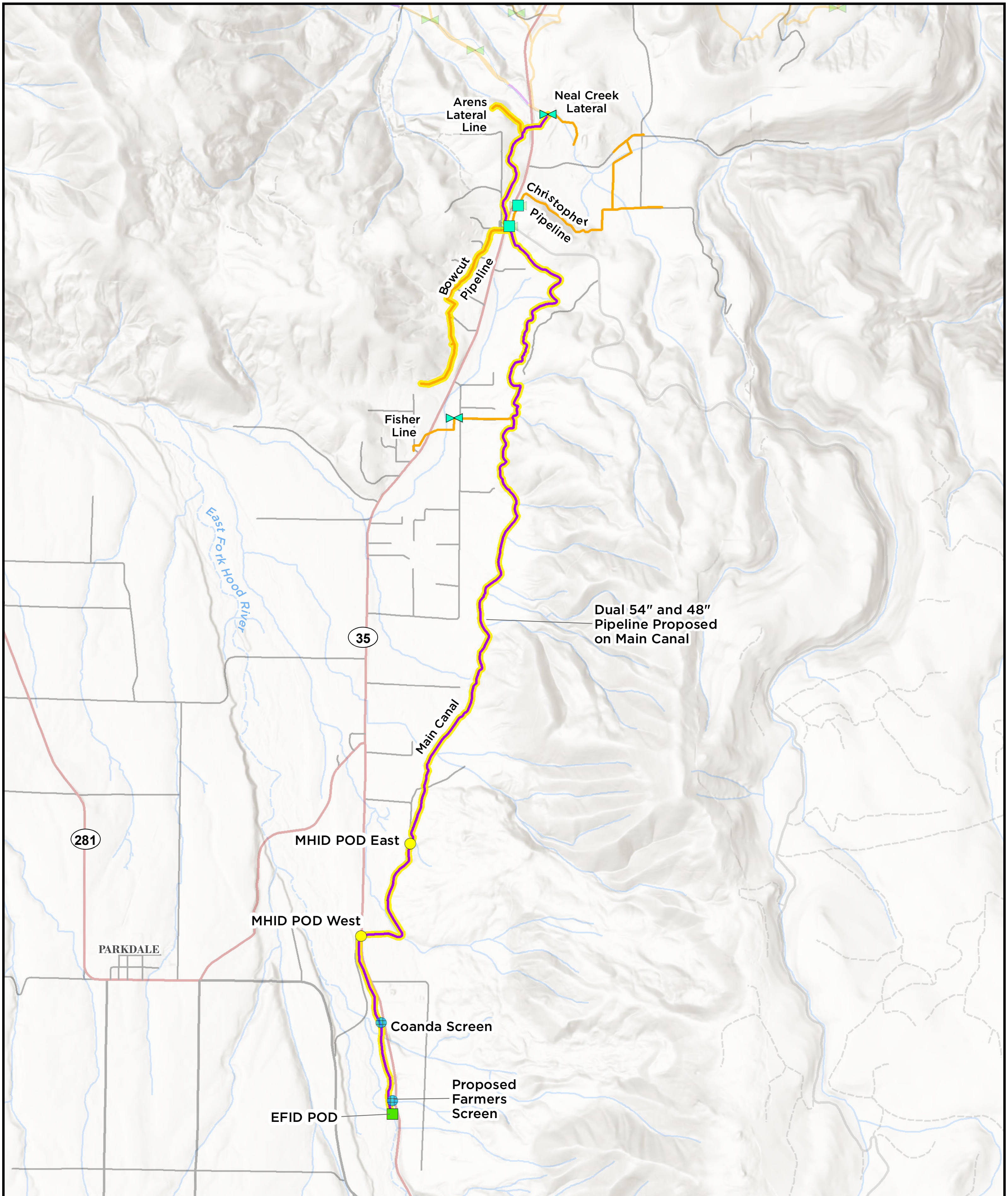
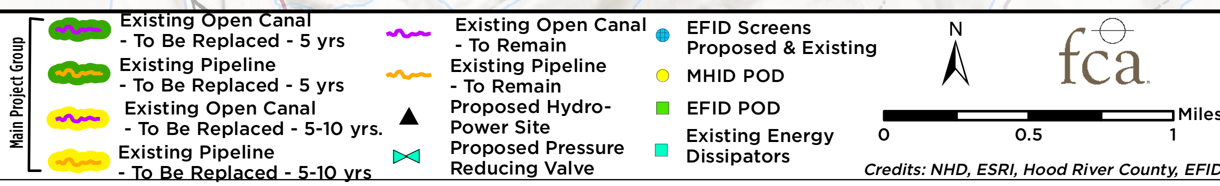


Figure 5

East Fork Irrigation District
Alternative A
'Main' Project Group



*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein. ***

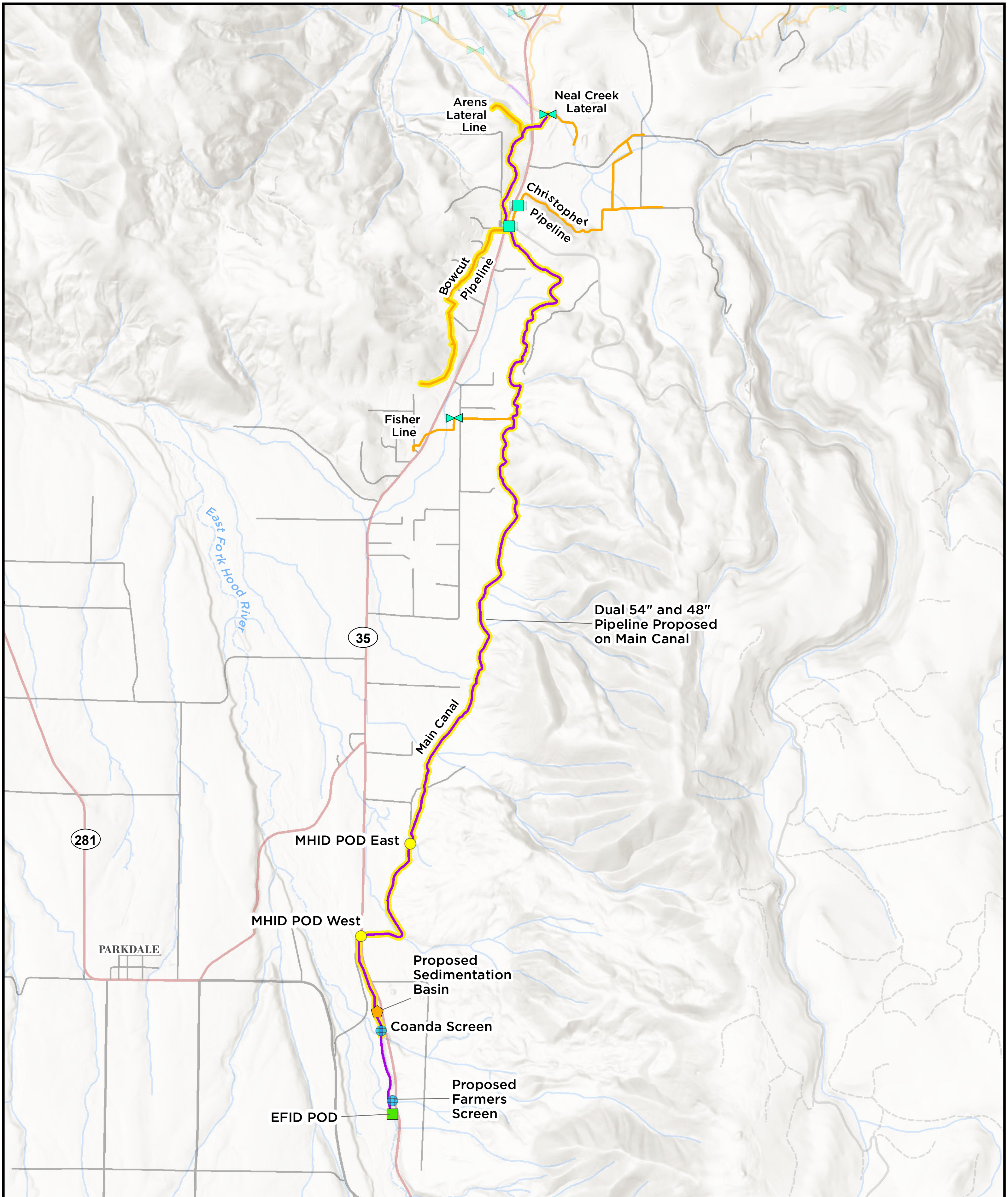


Figure 6

East Fork Irrigation District Alternative B 'Main' Project Group

Main Project Group:
- Existing Open Canal - To Be Replaced - 5 yrs
- Existing Pipeline - To Be Replaced - 5 yrs
- Existing Open Canal - To Be Replaced - 5-10 yrs.
- Existing Pipeline - To Be Replaced - 5-10 yrs

- Existing Open Canal - To Remain
- Existing Pipeline - To Remain
- Proposed Hydro-Power Site
- Proposed Pressure Reducing Valve
- Proposed Sedimentation Basin
- EFID Screens Proposed & Existing
- MHID POD
- EFID POD
- Existing Energy Dissipators

N

0 0.5 1 Miles

fca

Credits: NHD, ESRI, Hood River County, EFID

*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein. ***

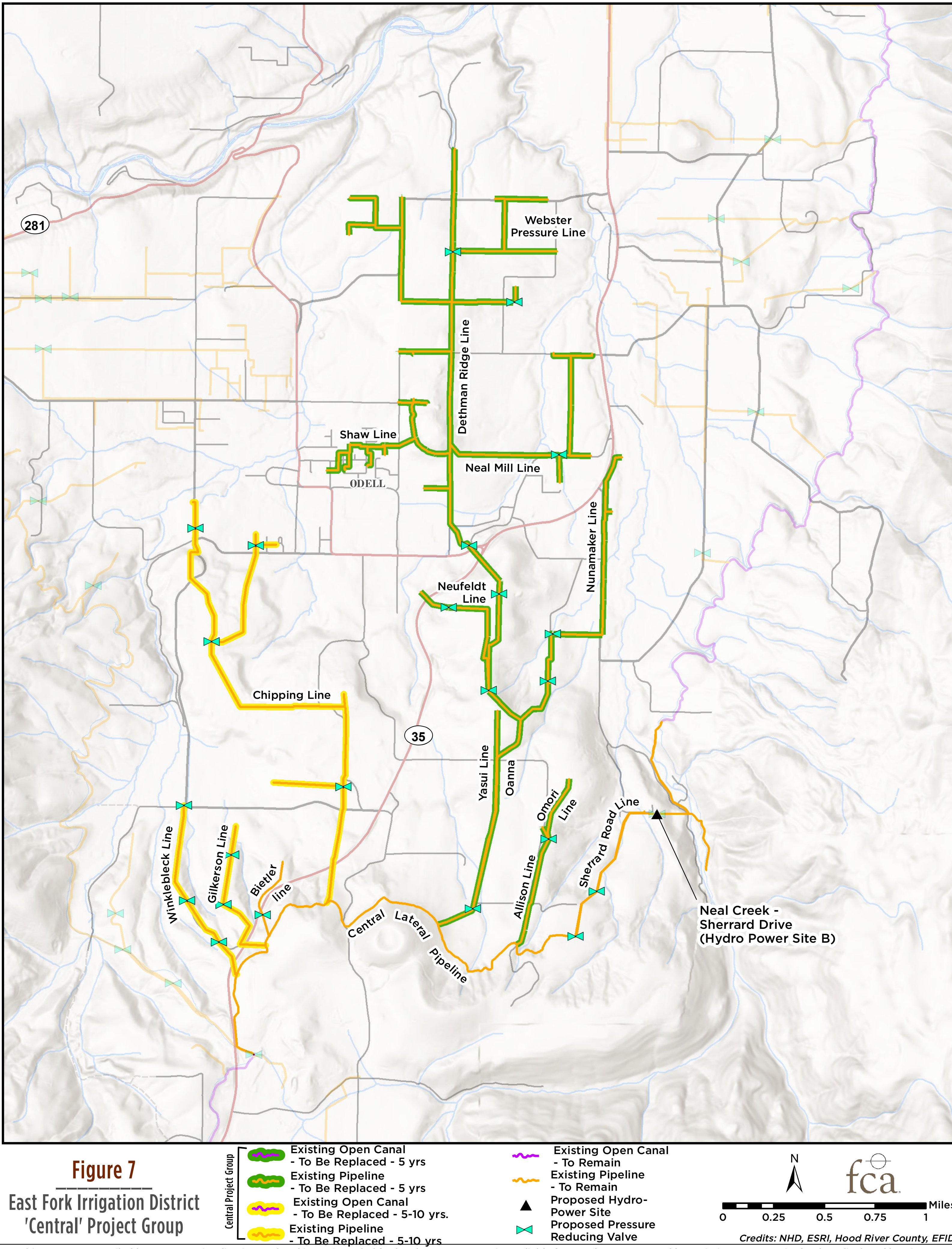


Figure 7

East Fork Irrigation District
'Central' Project Group

Credits: NHD, ESRI, Hood River County, EFID

*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein. ***

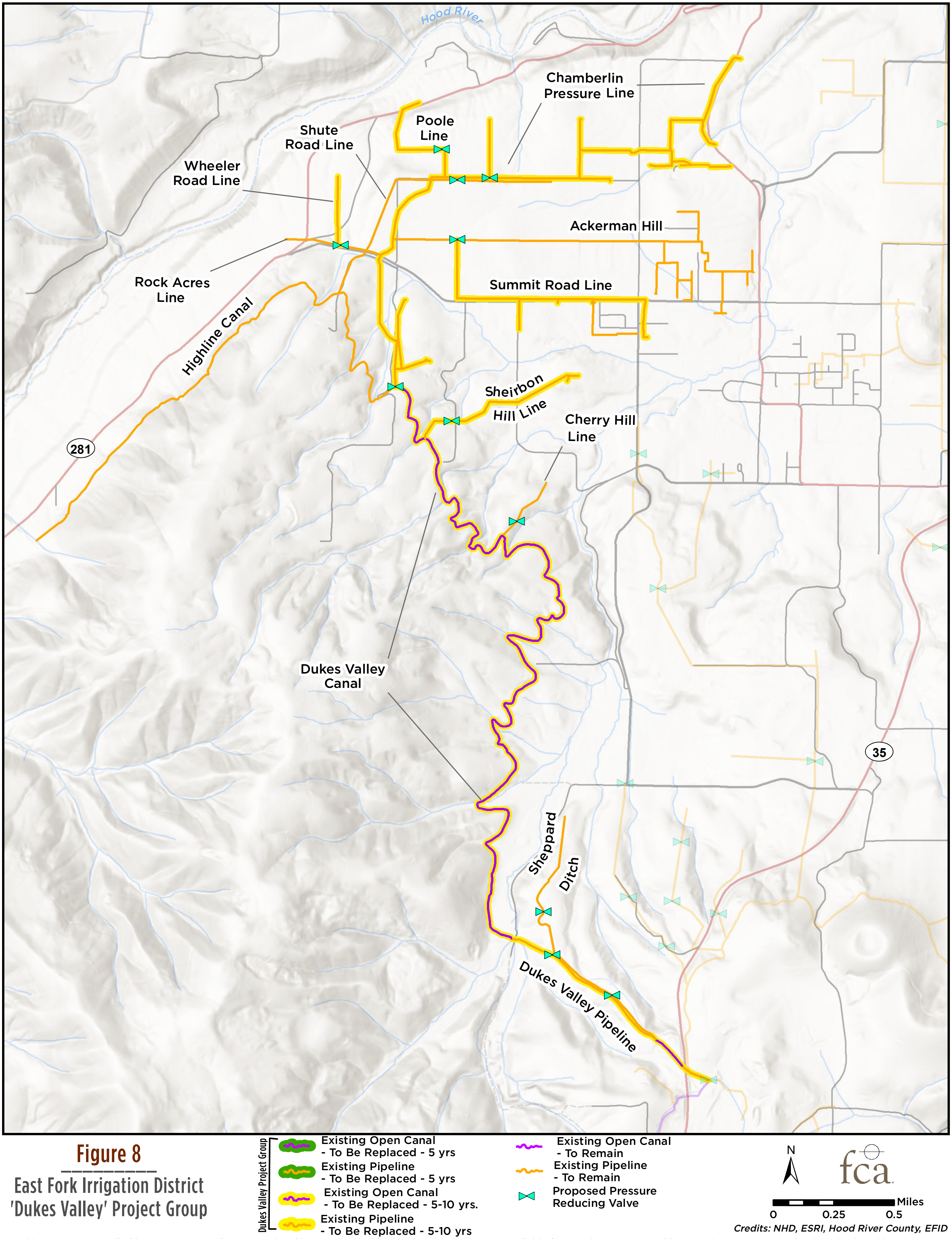


Figure 8

East Fork Irrigation District 'Dukes Valley' Project Group

*** This map was compiled by FCA as a visualization tool and is not intended for legal purposes. FCA is not liable for any damages caused by omissions or errors in the data displayed herein. ***

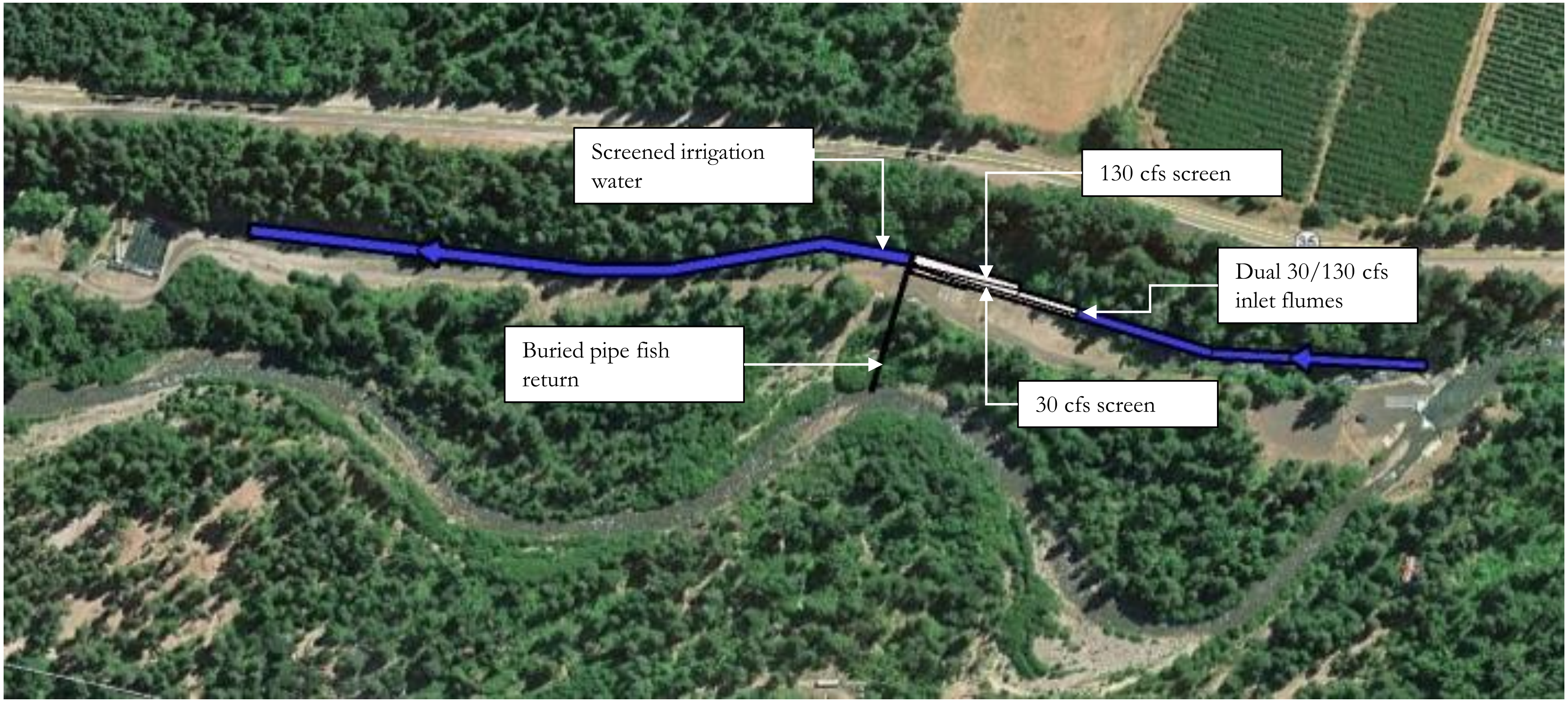


Figure 9. Proposed Farmers Conservation Alliance Dual 130 cfs/30 cfs Farmers Screen
East Fork Irrigation District
April 2018

fca

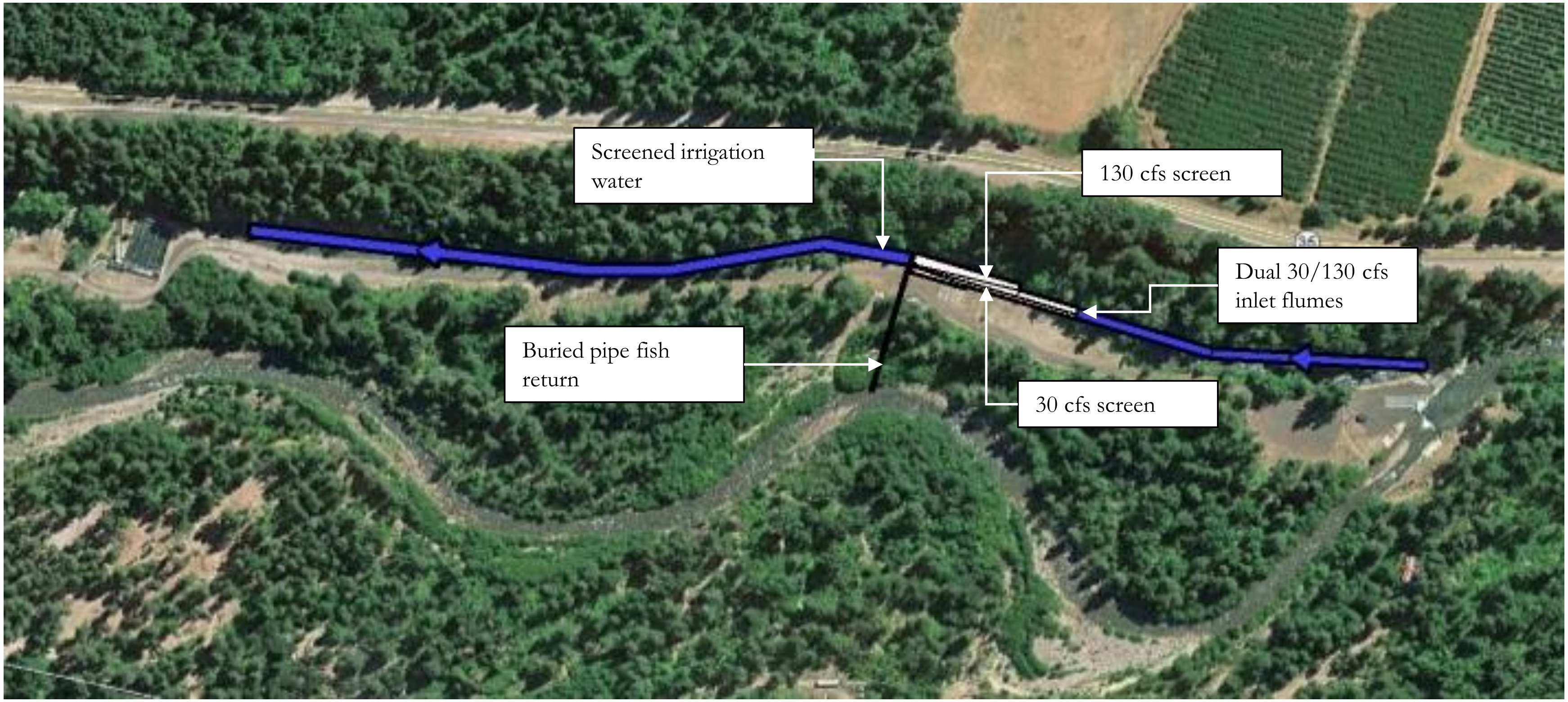


Figure 9. Proposed Farmers Conservation Alliance Dual 90 cfs/30 cfs Farmers Screen
East Fork Irrigation District
April 2018

Appendix A
Scope of Services

SCOPE OF SERVICES

Farmers Conservation Alliance (FCA) was commissioned to provide the following services and deliverables in conjunction with this plan:

KICKOFF MEETING

FCA met with District staff April 10, 2018 to confirm the approach to the study. At this meeting, FCA requested documents for major system elements that affect system hydraulic modeling. The District provided a copy of the District's existing reports, water diversion/water rights information, and associated operational input.

FCA discussed seepage loss information with the District and decided on a loss assessment approach coordinated by FCA and GMA Hydrology Inc.

FCA inquired about the energy dissipation preferences of the District (i.e. hydroelectric power generation and pressurized delivery preferences).

A second meeting on April 30, 2018 confirmed the approach to modernize the delivery system.

REVIEW OF MATERIALS

Following the kick-off meetings, FCA reviewed the materials obtained from the District to ensure that the required materials for moving the study forward were obtained or readily available during the study to develop the deliverables indicated below. Data gaps identified during the process were resolved with District staff.

COORDINATION

FCA coordinated with EFID staff to confirm that the SIP was developed in accordance with the direction of the District.

SEEPAGE LOSS STUDY

FCA coordinated the development of a water loss study, conducted by GMA, with support from EFID. The water loss study was implemented in accordance with methodologies recommend by the Oregon Water Resources Department (OWRD) to measure seepage loss and overflows associated with the delivery system. Results from the water loss study were used to assist with water conservation estimates and the development of project phasing for implementation of the modernized system.

REVIEW OF DISTRICT WATER ACCOUNTING AND DIVERSION DATA

FCA completed a thorough review of diversion data and on-farm delivery rates (per water rights certificates) to ensure accurate sizing of pressurized piping. FCA coordinated with the District to ensure rates used in system evaluation and modeling were as agreed upon by the District.

DEVELOPMENT OF EXISTING DELIVERY SYSTEM MAP AND GEODATABASE

Through several reviews completed by the District, FCA created a map of the District's existing delivery system. This map identifies existing canals and pipelines, the District's sole point of diversion, and the points of delivery. FireWhat prepared a draft geodatabase of the delivery system, which was revised by FCA with input from District staff and incorporating the water accounting data that was provided.

HYDRAULIC MODEL

FCA reaffirmed the approach regarding system pressurization. Following the agreed-upon approach and utilizing elevation information from pre-existing LiDAR data, FCA modeled the system elements (i.e. canals, laterals, and existing pipelines) with EPANET hydraulic modeling software. Each alternative was modeled separately in EPANET. Flow assumptions were based upon the rates agreed upon with EFID staff. FCA ran multiple iterations of the model to most effectively develop system elements (i.e. piping and pressure reducing elements, including PRV stations or hydroelectric power plant locations). Pipe materials and associated diameters were determined during this analysis.

PHASING APPROACH

In conjunction with the system model and upon review with EFID, FCA developed system improvement cost estimates that were generally broken down by the District's four ditch rider areas: Main Canal, Dukes Valley, Central Lateral Pipeline, and Eastside. This approach allows the District flexibility during design and implementation based upon funding availability and other critical considerations.

FINAL SIP MAPPING

In conjunction with EFID staff, FCA developed a final modernization map for each alternative, which included proposed piping that will be replaced, existing piping that will remain, proposed piping for open canals, and other key system elements.

RECONNAISSANCE-LEVEL COST ESTIMATE

FCA utilized an average price per pound of HDPE to develop reconnaissance-level cost estimates. The average-price-per-pound cost estimate is based on quotes that FCA has obtained from various piping vendors from 2016 to 2017.

SIP FINALIZATION

FCA compiled the results of the SIP study into a System Improvement Plan draft report for review and comment by EFID. Comments received were then incorporated as appropriate into the Final SIP Report. This report summarizes all findings for elements identified above and includes mapping.

GOALS AND OBJECTIVES – DISTRICT MEETING(S)

As indicated in the scope, FCA met with District staff on April 10, 2018. FCA and District staff discussed key project parameters required to establish the approach for the SIP.

The meeting was attended by:

John Buckley, EFID District Manager

Jaylene Hattig, EFID Water Rights Technician

Mattie Bossler, FCA Engineer

Preston Brown, FCA Project Manager

Alexis Vaivoda, FCA Program Specialist

Cindy Theiman, Hood River SWCD Watershed Council Coordinator

Key agenda items addressed are summarized below:

1. **Data Needs: Water rights certificates, existing reports, and water accounting data (direct river points and primary patron deliveries)**

   The District either provided these materials or provided directions on where they could be obtained. Resulting questions or clarifications regarding content were then discussed with the district.

2. **What are the plans for piping and pressurization of the District?**

   The District has diligently worked to install segments of pipe at select locations throughout the District.

   The District also confirmed a minimum dynamic pressure of 40 psi was required for patrons. The District will evaluate what pipes it might wish to preserve once it has the modeling results, including anticipated pressures, and as it develops its final designs and implements its improvements.

   Generally, the District plans to pipe a majority of its system, but the actual prioritization, scope, and timing of piping will be an ongoing consideration of the District.

   It is anticipated that pressures within the piped system will support significant hydroelectric power generation potential while subsequently providing pressurized water for individual patrons, thus mitigating pumping energy costs.

3. **Given that a majority of the water rights would dictate a diversion rate of 5.62 gpm/acre for peak delivery (including transmission losses) to the District's irrigated properties, what flow rate should be used in the model for peak-flow rates?**

   The model should use 5.62 gpm/acre for normal delivery modeling at 5 ft/s velocities (or less) in system elements per Natural Resource Conservation Service guidelines. This would ensure that the system will operate satisfactorily under future scenarios if additional irrigated lands were added to the canal system and, furthermore, to address climate change scenarios.

4. **FCA indicated that it planned to break out canal piping cost estimates into groups for flexibility in modernizing the system. Each project group may be broken down into smaller increments if necessary to provide the District with a high level of flexibility in financial planning and project implementation.**

   The District agreed with this approach.

5. **Does the District anticipate any shift of acreage or flow rates within the District boundary and service areas?**

   No, the District does not anticipate any shift in acreage or flow rates.

6. **Does the District anticipate any new water reuse or retention ponds?**

   No, the District does not anticipate a need for reuse or retention ponds.

Appendix B
Water Rights

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P.O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 25.0 ACRES.

This right was perfected under Permit 32685. The date of priority is JUNE 14, 1967. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 0.31 CUBIC FOOT PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

In processing the application towards issuance of the permit, it appears that a clerical error was inadvertently made in limiting the duty of water to not exceed 1/80th of one cubic foot per second of water per acre and 4.0 acre-feet per acre. In the issuance of this certificate, the duty of water has been corrected to 1/80th cubic foot per second per acre and 3.0 acre-feet per acre of water, for each acre irrigated during the irrigation season of each year, in keeping with the customary policy and determination this office setting the proper maximum limits of the right.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

43728.SB

Certificate Number 80926

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

Township	**Range**	**Section**	**1/4,1/4**	**Tax Lot**	**Acres**	**Landowner**
1 North	10 East	10 (D)	SE SE	1800	2.0	Nicholson, Lyle G Trust
1 North	10 East	10 (D)	SE SE	1900	0.5	Green, Katherine
1 North	10 East	10 (D)	SE SE	1902	0.5	Snyder, Richard & Ronda
1 North	10 East	10 (D)	SE SE	2001	1.2	Bullock, William L & Kathy A
1 North	10 East	10 (D)	SE SE	2100	1.0	Haun, J Franz & J Anne
1 North	10 East	10 (D)	SE SE	2200	0.4	Wiley, Donald B & Rose
2 North	10 East	1	SE SE	1800	1.8	Thomsen, V Robert & Elizabeth
2 North	10 East	13 (D)	NW SE	800	0.1	Mariscal, Santos A & Celia D
2 North	10 East	36	NE SW	2100	11.5	Yasui, R Thomas
2 North	10 East	36	NE SW	2200	1.8	Jacobsen, Carl A E & Jeanine
2 North	10 East	36	NW SW	2200	3.2	Jacobsen, Carl A E & Jeanine
2 North	10 East	36	NW SW	2400	0.5	Jacobsen, Carl A E & Jeanine
2 North	10 East	36	SW SW	2600	0.5	Peters, Harrison & Charlotte

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described. The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued August 25, 2004.

Dwight French for

Phillip C. Ward, Acting Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 80926.

43728.SB

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P. O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 57.0 ACRES.

This right was perfected under Permit 32101. The date of priority is OCTOBER 26, 1966. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 0.71 CUBIC FOOT PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

In processing the application towards issuance of the permit, it appears that a clerical error was inadvertently made in limiting the duty of water to not exceed 1/80th of one cubic foot per second of water per acre and 4.0 acre-feet per acre. In the issuance of this certificate, the duty of water has been corrected to 1/80th cubic foot per second per acre and 3.0 acre-feet per acre of water, for each acre irrigated during the irrigation season of each year, in keeping with the customary policy and determination this office setting the proper maximum limits of the right.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

42968.SB

Certificate Number 80927

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

Township	Range	Section	1/4,1/4	Tax Lot	Acres	Landowner
1 North	10 East	1	NW SW	1300	1.2	Collins, Cynthia
1 North	10 East	1	SW SW	1600	2.1	Jette, Fredrick W & Mary J
1 North	10 East	1	SW SW	1700	2.8	Jette, Fredrick W & Mary J
1 North	10 East	2	SW NE	600	1.2	Endow, Aya
1 North	10 East	2	NE NW	1001	0.45	Peters, Harrison & Charlotte D
1 North	10 East	2	SE NW	1001	0.05	Peters, Harrison & Charlotte D
1 North	10 East	2	NW NW	1100	4.5	King Orchards
1 North	10 East	2	SW NW	1201	0.5	Smith, Irvine R & Sherril J
1 North	10 East	2	SW NW	1400	0.8	Kaplan, David Alan
1 North	10 East	2	SW NW	1401	1.0	Walker, Donald W. & Joan K
1 North	10 East	2	SE NW	1600	1.3	D & P Orchards, Inc
1 North	10 East	2	SE NW	1700	1.0	Wolfe, Stephen V & Carol J
1 North	10 East	2	SW SW	1804	1.6	Hanel, William W & Barbara M
1 North	10 East	3	NE SE	2600	0.8	Cathey, Richard & Anne
1 North	10 East	3	NE SE	2603	1.0	Walker, Christopher & Elaine M
1 North	10 East	3	NE SE	2701	1.5	Johnson, Vernon F. & Kristi D
1 North	10 East	3	SE SE	3100	3.0	Hanel, Kathleen M
1 North	10 East	3	SE SE	3200	1.8	Hanel, Kathleen M
1 North	10 East	14	NW NW	300	7.0	Zeman, Michael L. & Nilsa N
1 North	10 East	22	SW NE	500	0.5	Reed, Jess D & Brown, Sheila A
1 North	10 East	22	SW NE	501	1.0	Lewis, Jimmie A & Janet M
1 North	10 East	22	SW NE	502	1.0	Staley, Ralph & Sharon L
1 North	10 East	22	SW NE	504	1.0	Byrne, James & Marjorie
1 North	10 East	22	SW NE	505	0.25	Mears, Mark J & Jodie R

Township	Range	Section	1/4,1/4	Tax Lot	Acres	Landowner
1 North	10 East	22	SW NE	506	0.25	Mears, Mark J & Jodie R
1 North	10 East	22	SW NE	507	1.0	Wadman, Mark B & Rebecca L
2 North	10 East	12	SE NE	400	3.0	Paasch, David A & Tedi Rae
2 North	10 East	21	SW SW	4100	0.1	Delpha A King Estate
2 North	10 East	21	SW SW	4700	0.5	Sommerville, Janet A
2 North	10 East	21	SW SW	4900	0.1	Arnold, Frank B & Gloria W
2 North	10 East	21	SW SE	5802	0.2	Sims, James E
2 North	10 East	21	NW SE	6101	0.2	Picking, Bradford G & Vicki L
2 North	10 East	27	NW NW	4400	0.9	Sheirbon, Joseph C
2 North	10 East	27	SW NW	4700	1.0	Sheirbon, Joseph C
2 North	10 East	27	NW SW	6100	1.0	Sheirbon, Joseph C
2 North	10 East	28	NW NE	2000	0.5	Sheirbon, Joseph C
2 North	10 East	28	NE SE	4000	1.8	Glacier Ranch, Inc
2 North	10 East	35	SW NE	500	3.2	Tamura Orchards, Inc
2 North	10 East	36(DC)	SW SE	700	0.6	Berquist, Lisa M
2 North	10 East	36(DC)	SW SE	800	0.3	Berquist, Lisa M
2 North	11 East	7	NE NW	1100	1.2	Laraway & Sons, Inc
2 North	11 East	7	NE NW	1200	1.8	Laraway & Sons, Inc
2 North	11 East	20	NW NW	1300	2.0	Guth, Ronald G & Margaret M

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described. The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued August 25, 2004.

Phillip C. Ward, Acting Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 80927.

42968.SB

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P. O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 89.0 ACRES.

This right was perfected under Permit 30825. The date of priority is AUGUST 13, 1965. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 1.1 CUBIC FEET PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

In processing the application towards issuance of the permit, it appears that a clerical error was inadvertently made in limiting the duty of water to not exceed 1/80th of one cubic foot per second of water per acre and 4.0 acre-feet per acre. In the issuance of this certificate, the duty of water has been corrected to 1/80th cubic foot per second per acre and 3.0 acre-feet per acre of water, for each acre irrigated during the irrigation season of each year, in keeping with the customary policy and determination this office setting the proper maximum limits of the right.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

41228.SB

Certificate Number 80928

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

Township	Range	Section	1/4,1/4	Tax Lot	Acres	Landowner
1 North	10 East	10	NE NE	100	2.9	Hanel Field LLC
1 North	10 East	10	NE NE	200	3.5	Hanel, William & Barbara
1 North	10 East	10	NE NE	201	0.6	Caldwell, B E & Gilona F
1 North	10 East	11	NW NW	301	1.0	Hanel, William & Barbara
1 North	10 East	11	NE SW	1300	11.0	Howard, Richard
1 North	10 East	11	NW SW	1301	4.0	Mt Hood Forest Products, LLC
1 North	10 East	11	NE SW	1304	2.0	Vieira, Lisa & Matthew
1 North	10 East	11	NE SW	1305	0.5	Vieira, Lisa & Matthew
1 North	10 East	11	NE SW	1307	7.0	Miller, Steven R & Rita
1 North	10 East	11(BD)	SE NW	100	1.3	Rausch, Gerd B
1 North	10 East	11(BD)	SE NW	400	1.0	Remer, Phillip L
1 North	10 East	11(BD)	SE NW	500	2.0	Gray, Randal & Wendy-Thompson
1 North	10 East	11(BD)	SE NW	800	1.5	Jacoby, Lawrence & Susan
1 North	10 East	11(BD)	SE NW	1000	0.35	Wells Fargo Home Mortgage, Inc
1 North	10 East	11(BD)	SE NW	1100	0.65	Garvin, Gary & Virginia
2 North	10 East	23	SW NW	1806	0.1	Stewart, Robert W. & Kimberly L
2 North	10 East	23	NW SW	1806	0.4	Stewart, Robert W. & Kimberly L
2 North	10 East	23	NW SW	2002	0.3	Chestnut, Donna Kay Williams
2 North	10 East	23	SW SW	2100	2.5	Udelius Orchards, Inc
2 North	10 East	23	SW SE	3500	0.3	Masiker, Clarence M. & Phyllis
2 North	10 East	23	SW SE	3600	0.3	Stone, Norman K & Jean M
2 North	10 East	24	SE NW	2500	2.0	Roy Webster Orchards
2 North	10 East	24	SE NW	2501	1.0	Hughes, Carl E
2 North	10 East	24	SW SE	3800	0.5	Kirby, Roy L & Wright, Mary Ann
2 North	10 East	24	SE SE	4403	4.85	Viewmont Orchards, LLC

Township	Range	Section	1/4,1/4	Tax Lot	Acres	Landowner
2 North	10 East	25 (C)	SW SW	1000	18.4	Hinman, Dale A
2 North	10 East	27 (D)	NE SE	203	0.2	Lewis, Dale J & Della R
2 North	10 East	34	NW NW	1500	1.0	Franks, Clarence F & Kathleen
2 North	10 East	34	SW NW	1500	1.9	Franks, Clarence F & Kathleen
2 North	10 East	34	SW SW	3200	0.8	Smith, Calvin L
2 North	10 East	35	SW NE	400	1.5	Yasui, Inc
2 North	10 East	35	NW NE	1000	1.5	D & P Orchards, Inc
2 North	10 East	35	NE NW	1400	0.9	Stohland, Marjorie Aileen
2 North	10 East	35	NE NW	1500	1.25	D & P Orchards, Inc
2 North	10 East	35	NE SW	2100	1.0	Yasui, Inc
2 North	10 East	35	NW SW	2500	1.3	Huang, Wen-Yang
2 North	10 East	35	SW SW	2600	1.1	Huang, Wen-Yang
2 North	10 East	35	SE SW	2900	2.0	Yasui, Inc
2 North	10 East	35	NW SE	3900	0.4	Walls, Timothy W & Carolyn A
2 North	10 East	35	NE SE	4200	1.2	Yasui, Inc
2 North	10 East	35	SE SE	4400	1.3	Packer, Wilma L
2 North	10 East	35	SE SE	4500	1.0	Packer, Wilma L
3 North	11 East	31	NW SW	2400	0.7	Nelson, William W

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described. The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued August 25, 2004.

Dwight French for

Phillip C. Ward, Acting Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 80928.

41228.SB

DC

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P.O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 478.8 ACRES.

This right was perfected under Permit 29617. The date of priority is MARCH 13, 1964. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 5.99 CUBIC FEET PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

In processing the application towards issuance of the permit, it appears that a clerical error was inadvertently made in limiting the duty of water to not exceed 1/80th of one cubic foot per second of water per acre and 4.0 acre-feet per acre. In the issuance of this certificate, the duty of water has been corrected to 1/80th cubic foot per second per acre and 3.0 acre-feet per acre of water, for each acre irrigated during the irrigation season of each year, in keeping with the customary policy and determination this office setting the proper maximum limits of the right.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

39634.SB

Certificate Number 80929

A description of the place of use to which this right is appurtenant is as follows:

Township	Range	Section	1/4,1/4	Tax Lot	Acres	Landowner
1 North	10 East	1	SE NW	800	5.5	Mallon, James & Shirley
1 North	10 East	1	NE SW	1000	0.2	Mallon, James & Shirley
1 North	10 East	1	NW SE	2300	9.4	Peters, Anthony C & Harrison
1 North	10 East	1	SW SE	2300	2.8	Peters, Anthony C & Harrison
1 North	10 East	1	NW SE	2400	5.5	Nakamura, Brian & Mittan, Marla
1 North	10 East	1	SW SE	2400	1.0	Nakamura, Brian & Mittan, Marla
1 North	10 East	2	SE NW	1600	15.0	D & P Orchards, Inc
1 North	10 East	2	SE SW	1800	8.4	Pessl, H Michael
1 North	10 East	2	NW SW	1806	0.6	Wy'east Vineyards, Ltd
1 North	10 East	2	SW SW	1806	1.4	Wy'east Vineyards, Ltd
1 North	10 East	3	SW NE	500	3.6	Sheirbon, Joseph W Jr
1 North	10 East	3	SE NE	700	3.1	Burris, Betty Anita
1 North	10 East	3	NE SW	1700	12.1	Ortman, Thomas L & Kay E
1 North	10 East	3	NE SW	1800	5.9	Ortman, Thomas L & Kay E
1 North	10 East	3	NW SW	2100	2.2	Bryant, John C
1 North	10 East	3	SW SW	2100	1.3	Bryant, John C
1 North	10 East	3	SE NE	2602	1.2	Weseman, Charles E & Christine
1 North	10 East	3	NE SE	2602	3.8	Weseman, Charles E & Christine
1 North	10 East	10	NW SE	900	1.8	Dennis, Edwin J & Susan E
1 North	10 East	10	NW SE	901	0.8	Gosson, James & Gail
1 North	10 East	10	NW SE	902	0.3	Coerper, Walter & Jodi S
1 North	10 East	10	NW SE	903	3.2	Dennis, Edwin J & Susan E
1 North	10 East	10	SW SE	1000	2.0	Monaghan, Patrick
1 North	10 East	10	SW SE	1100	1.0	Stewart, Robert W & Kimberly L
1 North	10 East	11	SE SW	1600	1.0	Smith, Donald L & Mary A
1 North	10 East	11	SW SE	1603	0.3	Smith, Donald L & Mary A

1 North	10 East	11	SW SE	1700	1.1	Sharkey, Lynn & Carolyn L
1 North	10 East	11	SE SE	1700	0.7	Sharkey, Lynn & Carolyn L
1 North	10 East	11	SW SE	1702	0.9	Bales, Donald L
1 North	10 East	11	SW SE	1703	1.0	Keller, Jack R & Mary
1 North	10 East	11	SW SE	1705	0.5	Smith, Terry & Jennifer
1 North	10 East	11	SW SE	1707	9.5	Smith, Terry & Jennifer
1 North	10 East	11	SE SE	1707	0.5	Smith, Terry & Jennifer
1 North	10 East	15	SW SW	1300	3.0	Parton, Dexter & Lois
1 North	10 East	15	SW SW	1400	0.45	Hall, Charles W & Margaret
1 North	10 East	15	SW SW	1401	1.75	Jenkins, David B & Sharon E
1 North	10 East	15	SW SW	1402	3.2	Stoltz, John R & Charlene M
1 North	10 East	15	SW SW	1403	4.0	Jenkins, David B & Sharon E
1 North	10 East	15	SW SW	1404	0.45	Jenkins, David B & Sharon E
1 North	10 East	15	SW SW	1405	1.2	Stoltz, John R & Charlene M
1 North	10 East	15	SW SW	1406	7.1	Stoltz, John R & Charlene M
1 North	10 East	15	SE NE	2200	1.3	Jeppesen, J H
1 North	10 East	22	SW NE	401	0.4	Smith, Darren & Renae
1 North	10 East	22	SW NE	402	0.3	Olsen, Robert A & Mary M
1 North	10 East	22	SW NE	403	0.4	Fey, Michael
1 North	10 East	22	SW NE	405	0.4	Caryl, Paul L & Diana
1 North	10 East	22	SW NE	406	0.5	Abel, Kurt
1 North	10 East	22	SW NE	407	0.2	McCormick, John E & Nancy R
1 North	10 East	22	SW NE	408	0.2	McMahan, Hugh B & Linda B
1 North	10 East	22	SW NE	409	0.5	Church, John B & Donna Renee
1 North	10 East	22	SW SE	5200	11.2	Lowe, John E & Deltha J
1 North	10 East	22	NW NW	900	0.75	Atteburry, Stephen & Mary Ann
1 North	10 East	22	NW NW	1000	0.1	Valley Worship Center
1 North	10 East	22	NW NW	1101	0.5	Stoltz, John R & Charlene M
1 North	10 East	22	NW NW	800	0.3	Garrett, Catherine W
1 North	10 East	34	SW SW	600	3.1	Dominquez, Luis B

2 North	10 East	12	SW NE	400	4.0	Paasch, David A. & Tedi Rae
2 North	10 East	14	SW NE	300	1.4	Shadowfax Orchards, Inc
2 North	10 East	14	SE NE	300	1.1	Shadowfax Orchards, Inc
2 North	10 East	14	SW NE	400	12.8	Roy Webster Orchards
2 North	10 East	14	NW SE	400	0.8	Roy Webster Orchards
2 North	10 East	14	SE NW	1400	1.5	Roy Webster Orchards
2 North	10 East	14	SE NW	1900	4.5	Roy Webster Orchards
2 North	10 East	14	NE SW	1900	1.0	Roy Webster Orchards
2 North	10 East	14	SW SW	2600	1.5	Sheppard Orchards, Inc
2 North	10 East	22	NE NW	1500	0.4	R & N Kirby Orchards, Inc
2 North	10 East	22	NW NW	1200	1.2	R & N Kirby Orchards, Inc
2 North	10 East	22	NW NW	1300	1.9	R & N Kirby Orchards, Inc
2 North	10 East	22	NE NW	1000	3.9	Graves, Robert R & Kimberly J
2 North	10 East	24	SW SE	3700	10.0	Moore Orchards, Inc
2 North	10 East	25	NE NE	100	11.2	Moore Orchards, Inc
2 North	10 East	25	NW NE	100	0.8	Moore Orchards, Inc
2 North	10 East	25	SE SW	1100	2.6	Hinman, Dale A
2 North	10 East	25	SE SW	1200	0.5	Andresen, Sylvia M
2 North	10 East	25	SE SW	1300	2.9	Hinman, Dale A
2 North	10 East	25	SE SW	1400	5.6	Hinman, Dale A
2 North	10 East	26	NW NE	300	1.5	John DeGroot, Trustee
2 North	10 East	26	NW NE	400	0.6	Cochran, Brian L
2 North	10 East	26	NW NE	401	0.4	Udelius, Michael & Elaine
2 North	10 East	26	NW NE	700	7.5	John DeGroot, Trustee
2 North	10 East	26	NW NW	900	1.1	Vance, Lois
2 North	10 East	26	NE SE	1200	0.6	C M & W O Sheppard, Inc
2 North	10 East	27	NW SW	6600	6.8	Glacier Ranch, Inc
2 North	10 East	27	NW SW	6700	3.0	Sheirbon, Gerald L
2 North	10 East	27	SE SW	7100	1.5	Goe, Donald L & Helen M

2 North	10 East	27	NE SE	1300	0.3	Jimenez, Jesus & Eufrosina
2 North	10 East	27	NE SE	1408	0.05	Layson, John & Carolyn
2 North	10 East	27	NE SE	1409	0.1	Layson, John & Carolyn
2 North	10 East	27	SE SE	2100	0.3	Kennedy, Anna Pauline
2 North	10 East	27	SE SE	2102	0.7	Kennedy, Anna Pauline
2 North	10 East	33	NE SE	1000	25.8	Bohince, Sean & Julie
2 North	10 East	33	NW SE	1000	1.0	Bohince, Sean & Julie
2 North	10 East	34	NW NW	1502	14.7	Swihart, Matthew S & Mary H
2 North	10 East	35	SE NE	200	11.0	Yasui, Inc
2 North	10 East	35	NW NE	600	1.0	Davis P F, Davis, J A & P
2 North	10 East	35	NW NW	1600	1.0	D & P Orchards, Inc
2 North	10 East	35	NW NW	1700	0.8	Davis P F, Davis, J A & P
2 North	10 East	35	SE NW	1907	0.8	Hanel, Robert L
2 North	10 East	35	SW SE	3100	0.2	Lo, Alex
2 North	10 East	36	NW NW	1600	4.5	Hinman Orchards, Inc
2 North	10 East	36	SW NW	1700	10.0	Powell, Lillian G Trust
2 North	10 East	36	SW NW	1701	0.8	Powell, Lillian G Trust
2 North	10 East	36	NE SE	100	1.0	Swyers, Alice T
2 North	10 East	36	NE SE	300	1.3	Moilanen-Craig, Dorothy L
2 North	10 East	36	NE SE	400	0.6	Wacker, Gerald D & Geraldine
2 North	10 East	36	NE SE	600	0.2	Rhodes, David M & Diane V
2 North	10 East	36	NE SE	800	1.0	Huff, Robert D
2 North	10 East	36	NE SE	900	1.0	Wacker, Gerald D & Geraldine
2 North	10 East	36	NE SE	1200	1.0	Winer, Michael D
2 North	10 East	36	NE SE	1300	2.0	Guess, Dean E & DesRochers, D
2 North	10 East	36	NW SE	300	1.5	Tracy, Mitchell & Going, C
2 North	10 East	36	NW SE	1400	1.0	Wells, John T
2 North	11 East	6	SW NE	301	1.0	Ortega Orchards, Inc
2 North	11 East	6	SE NW	301	3.9	Ortega Orchards, Inc
2 North	11 East	6	NW NE	500	0.5	Keir, David D

2 North	11 East	6	NE NW	500	0.4	Keir, David D
2 North	11 East	6	NW NE	600	3.3	Cheatham, J North
2 North	11 East	6	NE NW	701	1.3	Cheatham, J North
2 North	11 East	6	NE NW	800	0.5	Cheatham, J North
2 North	11 East	6	NE SW	2000	0.9	Fox, Richard H & Ellana M
2 North	11 East	6	NE SW	2001	2.1	Fox, Richard H & Ellana M
2 North	11 East	6	SE SW	2001	0.8	Fox, Richard H & Ellana M
2 North	11 East	6	NE SW	2100	2.0	Ing, George & Muriel J
2 North	11 East	6	SW SW	2500	0.6	Boyden, Daniel & Julie
2 North	11 East	6	SE SW	2500	0.1	Boyden, Daniel & Julie
2 North	11 East	6	SE SW	3300	0.2	Watts, Brian & Jeanie
2 North	11 East	6	SW SE	3400	0.2	Corrado, Vita C Trust
2 North	11 East	7	SW NE	600	2.0	Scobee, Dale P & Judith A
2 North	11 East	7	SE SE	3000	9.0	Moore, E Bruce & Mary L
2 North	11 East	7	SE SE	3003	2.0	Redhead, Henry L & Verle M
2 North	11 East	18	NW NE	100	0.45	Ceaser, Robert Trustee
2 North	11 East	18	NW NE	300	1.2	Lage Orchards, Inc
2 North	11 East	18	SE NE	400	6.0	Viewmont Orchards, LLC
2 North	11 East	18	SE NE	500	1.0	Viewmont Orchards, LLC
2 North	11 East	18	NE SW	1700	0.5	Lage Orchards, Inc
2 North	11 East	18	SW SW	2700	1.0	Viewmont Orchards, LLC
2 North	11 East	18	NE SE	3500	4.3	Viewmont Orchards, LLC
2 North	11 East	18	NE SE	3600	6.95	Viewmont Orchards, LLC
2 North	11 East	18	SE SE	3800	8.2	Viewmont Orchards, LLC
2 North	11 East	19	NE NE	100	3.1	Wells, W Gowlan & Jeanette TR
2 North	11 East	19	NW NE	100	1.0	Wells, W Gowlan & Jeanette TR
2 North	11 East	19	NE NE	101	3.5	Waller, David P & Nancy Jo
2 North	11 East	19	NE NE	102	2.0	Ellis, Robert M & Davinne
2 North	11 East	19	NE NE	200	6.3	Viewmont Orchards, LLC

2 North	11 East	19	SE NE	200	1.7	Viewmont Orchards, LLC
2 North	11 East	19	SE NE	300	2.2	Viewmont Orchards, LLC
2 North	11 East	19	SE NE	400	12.8	Viewmont Orchards, LLC
2 North	11 East	19	SE NW	600	0.8	Cascade Orchards, Inc
2 North	11 East	19	NE SW	600	0.3	Cascade Orchards, Inc
2 North	11 East	19	NW SW	600	0.1	Cascade Orchards, Inc
2 North	11 East	19	NW SE	600	0.5	Cascade Orchards, Inc
2 North	11 East	19	SW NE	800	3.1	Viewmont Orchards, LLC
2 North	11 East	19	SE NW	800	1.4	Viewmont Orchards, LLC
2 North	11 East	19	SW NE	900	1.0	Viewmont Orchards, LLC
2 North	11 East	19	NW NE	1100	1.0	Lage Orchards, Inc
2 North	11 East	19	NW NW	1300	4.0	Viewmont Orchards, LLC
2 North	11 East	19	SW NW	1700	1.5	Viewmont Orchards, LLC
2 North	11 East	19	SE NW	2100	2.0	Wells, W Gowlan & Jeanette TR
2 North	11 East	19	SW SW	3000	0.3	Evans, David & Polly Matthews
2 North	11 East	30	NW NW	3000	0.2	Evans, David & Polly Matthews
2 North	11 East	19	SE SW	3200	1.5	Rhodes, David M & Diane V
2 North	11 East	30	SW NE	500	0.6	Sischo, Sanford & Heppenstall
2 North	11 East	30	SW NE	600	0.2	Johnston, Dale M & Marilyn
2 North	11 East	30	NW SE	600	0.8	Johnston, Dale M & Marilyn
2 North	11 East	30	NE NW	902	1.7	Willis Family, Inc
2 North	11 East	30	NW NW	1200	0.8	Blue Eagle Orchards, Inc
2 North	11 East	30	SW NW	1200	4.25	Blue Eagle Orchards, Inc
2 North	11 East	30	NW NW	1302	1.6	Mt Adams Oregon, LLC
2 North	11 East	30	SW NW	1302	0.3	Mt Adams Oregon, LLC
2 North	11 East	30	SW NW	1500	0.2	Elk Mountain, LLC
2 North	11 East	30	SW NW	1501	2.0	Elk Mountain, LLC
2 North	11 East	30	SE NW	1501	7.3	Elk Mountain, LLC
3 North	10 East	36	SE NE	601	0.6	Sheppard, Craig W
3 North	11 East	31	NW SE	900	7.0	Wells, Gary W & Maureen F

3 North	11 East	31	SE NW	3001	0.8	Hayes, Robert & Susan
3 North	11 East	31	NE SW	100	6.5	Cheatham, J North
3 North	11 East	31	NW SW	100	0.2	Cheatham, J North
3 North	11 East	31	SE SW	100	3.8	Cheatham, J North
3 North	11 East	31	NW SW	101	1.7	Adams, Glenn D & Marilyn J
3 North	11 East	31	NW SW	300	0.4	Pfost, Jeffery & Beth
3 North	11 East	31	NW SW	600	0.3	Longlund, Ruth P & Nigel P
3 North	11 East	31	NW SW	601	0.2	Tiffany, Ronald R & Patricia
3 North	11 East	31	NW SW	602	0.35	Tiffany, Ronald R & Patricia
3 North	11 East	31	NW SW	800	0.8	Reed, Richard & Christie
3 North	11 East	31	NW SW	803	0.15	Thompson, Mark & Gwen
3 North	11 East	31	NW SW	1100	0.2	Daggett, Douglas C & Darlene
3 North	11 East	31	NW SW	1200	0.2	Randall, Kenneth A

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described. The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued August 25, 2004.

Phillip C. Ward, Acting Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 80929.

39634.SB

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied. In addition, under ORS 537.260 any person with an application, permit or water right certificate subsequent in priority may jointly or severally contest the issuance of the certificate at any time before it has issued, and after the time has expired for the completion of the appropriation under the permit, or within three months after issuance of the certificate.

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P.O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 10.0 ACRES.

This right was perfected under Permit 46707. The date of priority is February 3, 1982. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed a total of 0.125 CUBIC FOOT PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

A description of the place of use to which this right is appurtenant is as follows:

Twp	Rng	Mer	Sec	Q-Q	TAX LOT	ACRES	LANDOWNER
1 N	10 E	WM	10	SE NE	905	0.10	Douthit, Brett Allen
1 N	10 E	WM	10	NE SE	905	1.40	Douthit, Brett Allen
2 N	10 E	WM	28	SW SE	3600	2.00	Kollas, Elizabeth
2 N	10 E	WM	28	NW SE	3900	5.00	Kollas, Elizabeth
2 N	10 E	WM	28	SE NW	2700	1.50	Eastman, Douglas A. & Brenda K.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described.

The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued SEP 0 5 2008.

Dwight French for
~~Phillip C. Ward, Director~~
Water Resources Department

63241.jwg

Recorded in State Record of Water Right Certificates Number 84802.

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied. In addition, under ORS 537.260 any person with an application, permit or water right certificate subsequent in priority may jointly or severally contest the issuance of the certificate at any time before it has issued, and after the time has expired for the completion of the appropriation under the permit, or within three months after issuance of the certificate.

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
P.O. BOX 162
ODELL, OREGON 97044

confirms the right to use the waters of the EAST FORK HOOD RIVER, a tributary of HOOD RIVER, for IRRIGATION OF 405.0 ACRES.

This right was perfected under Permit 43395. The date of priority is August 8, 1977 for 4.45 cubic feet per second (cfs) and August 3, 1978 for 0.61 cfs. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed a total of 5.06 CUBIC FEET PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source.

The point of diversion is located as follows:

NW 1/4 SW 1/4, SECTION 4, TOWNSHIP 1 SOUTH, RANGE 10 EAST, W.M.; 3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, is limited to ONE-EIGHTIETH of one cubic foot per second per acre, or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year.

A description of the place of use to which this right is appurtenant is as follows:

Twp	Rng	Mer	Sec ( )*	Q-Q	TAX LOT	ACRES	LANDOWNER
*(County map number as of March 17, 2005)							
1 N	10 E	WM	1	NW NE	301	7.50	Blaine, Gorham
1 N	10 E	WM	1	SW NE	301	8.30	Blaine, Gorham
1 N	10 E	WM	1	NE NW	301	4.20	Blaine, Gorham
1 N	10 E	WM	1	SE NW	800	5.00	Mallon, James & Shirley
1 N	10 E	WM	2	SW NW	1200	1.50	Mulkey, Ann L.
1 N	10 E	WM	2	SW NW	1300	0.50	Walker, Elaine M.
1 N	10 E	WM	2	NE SE	2000	1.50	Goss, Truman & Mildred
1 N	10 E	WM	2	SE SE	2000	7.50	Goss, Truman & Mildred
1 N	10 E	WM	3	NW SW	1300	8.00	Bryant, John C.
1 N	10 E	WM	3	SW SW	2100	6.00	Bryant, John C.
1 N	10 E	WM	10	NW NE	401	0.40	Reed, Charles H. & Victoria K.
1 N	10 E	WM	10	NE NW	1302	4.00	Mooney, Everett W. & Margaret
1 N	10 E	WM	10 (D)	NW SE	800	0.50	Metcalfe, Phil & Carol Lynn
1 N	10 E	WM	10 (D)	SW SE	1202	0.60	Boomer, Dave F. & Vickie E.
1 N	10 E	WM	10 (D)	NE SE	200	4.10	Mt. Hood Forest Products, LLC
1 N	10 E	WM	10 (D)	NE SE	300	4.50	Mt. Hood Forest Products, LLC
1 N	10 E	WM	11	SE SW	1601	0.50	Smith, Ronald L. & Terry A.
1 N	10 E	WM	15	SW NE	500	0.20	Nastasi, Constance R. & Carmel
1 N	10 E	WM	15	SW NE	600	0.20	Nastasi, Constance R. & Carmel
1 N	10 E	WM	15	SE NW	1100	0.50	Cosens, Guy K. & Pennie L.
1 N	10 E	WM	15	NE SE	2501	1.00	Neufeldt, Roger E. & Ada L.
1 N	10 E	WM	15	NW SE	2501	0.70	Neufeldt, Roger E. & Ada L.
1 N	10 E	WM	15	NW SE	2600	1.00	Shaw, Brian
1 N	10 E	WM	15 (A)	NE NE	100	0.60	Bailey, Arnold
1 N	10 E	WM	15 (A)	NW NE	1100	1.00	Castaneda, Felipe
1 N	10 E	WM	15 (A)	NW NE	1500	1.00	Neill, John
1 N	10 E	WM	15 (A)	SW NE	2500	0.20	Wheeler, Ann L. & Welander, Gary
1 N	10 E	WM	15 (A)	SE NE	2500	1.00	Wheeler, Ann L. & Welander, Gary
1 N	10 E	WM	15 (A)	SW NE	2600	0.40	Hinkle, Walter E. & Effie June
1 N	10 E	WM	22	SW NE	508	0.30	Harding, Keith & Karen
1 N	10 E	WM	22 (B)	NW NW	1111	2.25	King, Ed & Bonnie
1 N	10 E	WM	22 (B)	NW NW	1112	2.25	Jenkins, David B. & Sharon E.
1 N	11 E	WM	6	SW NW	600	0.10	Semple, Julie
2 N	10 E	WM	13	NE NE	100	25.00	Viewmont Orchards, LLC
2 N	10 E	WM	13	NE NE	200	0.10	Viewmont Orchards, LLC
2 N	10 E	WM	13	SE NE	200	0.15	Viewmont Orchards, LLC
2 N	10 E	WM	13	SE SW	2700	0.40	Blake, Rodney & Kerry
2 N	10 E	WM	14	SE NE	300	1.20	Shadowfax Orchards
2 N	10 E	WM	14	SW NE	400	1.00	Roy Webster Orchards
2 N	10 E	WM	14	NW NE	500	5.00	Roy Webster Orchards
2 N	10 E	WM	14	NW NE	600	0.40	Roy Webster Orchards
2 N	10 E	WM	14	NE NW	600	0.10	Roy Webster Orchards
2 N	10 E	WM	14	SE NW	600	0.50	Roy Webster Orchards
2 N	10 E	WM	14	NE NW	1400	2.00	Roy Webster Orchards
2 N	10 E	WM	14	SE NW	1400	8.00	Roy Webster Orchards

2 N	10 E	WM	14	NE SW	1900	4.00	Roy Webster Orchards
2 N	10 E	WM	14	SE SW	2800	5.30	Gale Orchards, Inc.
2 N	10 E	WM	14	NE SE	3600	3.10	Gilkerson Orchards, Inc.
2 N	10 E	WM	14	NW SE	3600	0.70	Gilkerson Orchards, Inc.
2 N	10 E	WM	16	SE SE		1.45	Franklin, Susan M. (see map 2 N 10 E 21A TL 100)
2 N	10 E	WM	16	SW SE		0.05	Franklin, Susan M. (see map 2 N 10 E 21A TL 100)
2 N	10 E	WM	21	SE NW	600	0.20	Poole, Donald R. & Cynthia J.
2 N	10 E	WM	21	SE NW	601	0.30	Poole, Donald R. & Cynthia J.
2 N	10 E	WM	21	SE NW	800	0.10	Hollamon, Barry W. & Julie
2 N	10 E	WM	21	NE SW	2900	3.40	Sheirbon, Joseph C. & Gertrude G.
2 N	10 E	WM	21	SE SW	3200	1.00	Borton, Marvin O. & Verona B.
2 N	10 E	WM	21	SE SW	3300	0.30	Helen Asbury Trust
2 N	10 E	WM	21	SE SW	3500	0.10	Jones, Walter M. & Barbara G.
2 N	10 E	WM	21	SE SW	3501	0.10	Gehrig, Ronald J. & Sherryl N.
2 N	10 E	WM	21	SE SW	3700	0.10	Porter, James Grant & Sandra Jean
2 N	10 E	WM	21	SE SW	5201	1.80	McNeill, Ronald L. & Judith H.
2 N	10 E	WM	21 (A)	NE NE	1100	2.00	Wilds, R. Janeen
2 N	10 E	WM	21 (A)	NW NE	1100	0.70	Wilds, R. Janeen
2 N	10 E	WM	21 (A)	NE NE	1200	1.30	Wilds, R. Janeen
2 N	10 E	WM	21 (A)	NE NE	1300	1.30	Philley, Jr.,Minard L. & Dianne K.
2 N	10 E	WM	22 (A)	NW NE	202	0.30	Oates, Michael J. & Kathy M.
2 N	10 E	WM	22 (A)	NE NE	300	1.00	Beachman Orchards, Inc.
2 N	10 E	WM	22 (DB)	NW SE	200	1.70	Marquez, Felipe & Maria
2 N	10 E	WM	22 (DB)	NW SE	400	0.70	Glacier Ranch, Inc.
2 N	10 E	WM	24	NW SW	3200	1.00	Goe, Donald L. & Helen M., Trustee
2 N	10 E	WM	25	SE SE	4200	0.70	Santavicca, Arthur & Lavada
2 N	10 E	WM	25 (B)	SE NE	1301	0.40	Cardinal IG Company
2 N	10 E	WM	26 (BC)	SW NW	2300	1.00	Ashbaugh, Kenneth D. & Dona L.
2 N	10 E	WM	26 (BC)	SW NW	2400	0.60	Tobey, Sharon
2 N	10 E	WM	26 (BC)	SW NW	2500	0.65	Farias, Daniel & Geraldine
2 N	10 E	WM	26 (BC)	SW NW	3300	0.10	Valle, Amador & Ilda
2 N	10 E	WM	26 (BD)	SE NW	308	0.10	Nolasco, Alvaro & Campos-Nolasco, Alma Rosa
2 N	10 E	WM	26 (BD)	SE NW	3100	0.05	Torres, Jose M.
2 N	10 E	WM	27	SE NW	5200	3.20	Titus, Rick
2 N	10 E	WM	27	SE NW	5300	6.50	Smith, Steven R. & Maria C.
2 N	10 E	WM	27	SE NW	5400	2.00	Gillmouthe, Janiece E.
2 N	10 E	WM	27	NE SW	5700	0.20	Verda W. Hart Trust
2 N	10 E	WM	27	NW SW	6500	0.60	Gonzalez, Guadalupe & Rosalio
2 N	10 E	WM	27	SW SW	7000	1.00	Clarence N. Williams Trust
2 N	10 E	WM	27 (A)	NE NE	2200	1.00	Wells, James G. & Wilma J.
2 N	10 E	WM	27 (BA)	NE NW	100	0.07	McClellan, Virginia I.
2 N	10 E	WM	27 (BA)	NE NW	101	0.13	Munoz, Seferino
2 N	10 E	WM	27 (BA)	NE NW	200	0.13	Jans, Sharon S. & James M.
2 N	10 E	WM	27 (BA)	NE NW	300	0.13	Thomas, Jerry D. & Caron L.
2 N	10 E	WM	27 (BA)	NE NW	400	0.13	Campbell, Jerry W. & Sheila M.
2 N	10 E	WM	27 (BA)	NE NW	500	0.13	Benedict, Timothy D. & Kim A.
2 N	10 E	WM	27 (BA)	NE NW	600	0.13	Hobbs, Pat E. & Judith
2 N	10 E	WM	27 (BA)	NE NW	700	0.13	Simonds, Seth D.
2 N	10 E	WM	27 (BA)	NE NW	800	0.13	Smiley, Truman L. & Sharon A.
2 N	10 E	WM	27 (BA)	NE NW	900	0.08	Carter, Linda C.
2 N	10 E	WM	27 (BA)	NE NW	1000	0.08	Culpepper, Gary L. & Robyn A.
2 N	10 E	WM	27 (BA)	NE NW	1100	0.13	True, George & Erica

2 N	10 E	WM	27 (BA)	NE NW	1200	0.08	Miramontes, Salvador
2 N	10 E	WM	27 (BA)	NE NW	1300	0.08	Nichols, Hazel M.
2 N	10 E	WM	27 (BA)	NE NW	1400	0.08	Thompson, Lance M. & Patricia
2 N	10 E	WM	27 (BA)	NE NW	1500	0.08	Espinosa, Adan & Galvez, Lourdes
2 N	10 E	WM	27 (BA)	NE NW	1600	0.08	Smiley, Jason & Kimberly A.
2 N	10 E	WM	27 (BA)	NE NW	1700	0.08	Farlow, Bonnie K.
2 N	10 E	WM	27 (BA)	NE NW	1800	0.08	Woody, John W. & Brenda L.
2 N	10 E	WM	27 (BA)	NE NW	1900	0.08	Perez, Pablo A. & Pamela J.
2 N	10 E	WM	27 (BA)	NE NW	2000	0.08	Olsen-Pullen, Lorene M.
2 N	10 E	WM	27 (BA)	NE NW	2100	0.08	Miller, Steven Ray
2 N	10 E	WM	27 (BA)	NE NW	2200	0.08	Munoz, Jaime & Alicia J.
2 N	10 E	WM	27 (BA)	NE NW	2300	0.07	Jaynes, Mark
2 N	10 E	WM	27 (BA)	NE NW	2400	0.07	Varga, Robert J.
2 N	10 E	WM	27 (BA)	NE NW	2500	0.07	Reyes, Valentin & Rufina
2 N	10 E	WM	27 (BA)	NE NW	2600	0.07	Magana, Blake G. & Ernestina
2 N	10 E	WM	27 (BA)	NE NW	2700	0.07	Justice, Thomas J. & Colletta J.
2 N	10 E	WM	27 (BA)	NE NW	2800	0.07	Salamanca, Ramon & Guillermina
2 N	10 E	WM	27 (BA)	NE NW	2900	0.07	Coon, Larry D. & Donna K.
2 N	10 E	WM	27 (BA)	NE NW	3000	0.07	Daniels, Paul G.
2 N	10 E	WM	27 (BA)	NE NW	3100	0.07	Yaw, Robert & Veronica
2 N	10 E	WM	27 (BA)	NE NW	3200	0.07	Macias, Felicia & Armando
2 N	10 E	WM	27 (BA)	NE NW	3300	0.07	Castro, Ines C.
2 N	10 E	WM	27 (BA)	NE NW	3400	0.07	Jensen, Lester & Leticia
2 N	10 E	WM	27 (BA)	NE NW	3500	0.07	Wood, Andrea M. & Kyle M.
2 N	10 E	WM	27 (BA)	NE NW	3600	0.07	Lee, Gayle A. & Standley A.
2 N	10 E	WM	27 (BA)	NE NW	3700	0.07	Henderson, Brent A. & Mary C.
2 N	10 E	WM	27 (BA)	NE NW	3800	0.07	Endow, Terry & Denise
2 N	10 E	WM	27 (BA)	NE NW	3900	0.07	Serrano, Raul
2 N	10 E	WM	27 (BA)	NE NW	4000	0.07	Gandara, Reynaldo M.
2 N	10 E	WM	27 (BA)	NE NW	4100	0.07	Webb, Adam & Nikki
2 N	10 E	WM	27 (BA)	NE NW	4200	0.07	Rutherford, Betty M.
2 N	10 E	WM	27 (BA)	NE NW	4300	0.07	Chavarria, Eliseo & Maria B.
2 N	10 E	WM	27 (BA)	NE NW	4400	0.07	Elliott, Clifford S. & Debra J.
2 N	10 E	WM	27 (BA)	NE NW	4500	0.07	Solis, Obaldo & Imelda
2 N	10 E	WM	27 (BA)	NE NW	4600	0.07	Shewey, Bobby & Amber
2 N	10 E	WM	27 (BA)	NE NW	4700	0.07	De La Torre, Juan M. & Yolanda
2 N	10 E	WM	27 (BA)	NE NW	4800	0.07	De Sitter, Linda L. & Louis A.
2 N	10 E	WM	27 (BA)	NE NW	4900	0.07	Glenn, James F. & Dianna R.
2 N	10 E	WM	27 (BA)	NE NW	5000	0.07	Villafana, Miguel
2 N	10 E	WM	27 (BA)	NE NW	5100	0.07	Gamboa, Fidel & Gloria
2 N	10 E	WM	27 (BA)	NE NW	5200	0.07	Shewey, Beatrice A.
2 N	10 E	WM	27 (BA)	NE NW	5300	0.07	Castro, Enrique
2 N	10 E	WM	27 (BA)	NE NW	5400	0.07	Daniels, Paul G.
2 N	10 E	WM	27 (BA)	NE NW	5600	0.12	Riggleman, Debra M.
2 N	10 E	WM	27 (BA)	NE NW	5700	0.07	Lorengel, Ldee & Debra L.
2 N	10 E	WM	27 (BA)	NE NW	5800	0.07	Ball, Jeannie A.
2 N	10 E	WM	27 (BA)	NE NW	5900	0.07	Smith, Evert C.
2 N	10 E	WM	27 (BA)	NE NW	6000	0.07	Murillo, Gerardo & Manzo, Maria
2 N	10 E	WM	27 (BA)	NE NW	6100	0.07	Jimenez, Valente & Veronica M.
2 N	10 E	WM	27 (BA)	NE NW	6200	0.07	Windsor, Stanley A. & Zirena
2 N	10 E	WM	27 (BA)	NE NW	6300	0.07	Meza, Adalberto & Rosalba
2 N	10 E	WM	27 (BA)	NE NW	6400	0.07	Marquez, Juan L. & Clementina

2 N	10 E	WM	28	SW NE	1600	1.40	Williams, Jack & Judy
2 N	10 E	WM	28	NE NW	2100	0.80	Middle Mtn. Orchards, Inc.
2 N	10 E	WM	28	NE NW	2101	0.20	Marsh, Richard D. & Sharon L.
2 N	10 E	WM	28	SE NW	2700	1.70	Eastman, Douglas A. & Brenda K.
2 N	10 E	WM	28	SW NW	2800	5.00	Golden Mountain, LLC
2 N	10 E	WM	28	NE SW	2900	1.50	Golden Mountain, LLC
2 N	10 E	WM	28	NW SW	2900	5.25	Golden Mountain, LLC
2 N	10 E	WM	28	NE SW	2903	19.40	Golden Mountain, LLC
2 N	10 E	WM	28	SW SW	2903	14.90	Golden Mountain, LLC
2 N	10 E	WM	28	SE SW	2903	25.10	Golden Mountain, LLC
2 N	10 E	WM	28	NE SE	4000	1.00	Glacier Ranch, Inc.
2 N	10 E	WM	28	NE SE	4300	8.00	Moe, Fred E.
2 N	10 E	WM	29	NW NE	200	0.10	Cardon, L. Boyd & Donna
2 N	10 E	WM	29	NW SW	501	0.50	Ocheskey, Brent R. & Emily A.
2 N	10 E	WM	29	NE SW	502	0.50	Schrankel, Michael & Nicole
2 N	10 E	WM	29	NW SW	503	0.50	Vaday, Louis S. & Deborah J.
2 N	10 E	WM	29	NE SW	505	0.20	Schuppe, Robert H. & Barbara M. Trustee
2 N	10 E	WM	29	NE SW	507	0.10	Chenoweth, Arthur & Deborah
2 N	10 E	WM	29	NW SW	510	0.10	White, David A. & Katy L.
2 N	10 E	WM	29	NE SW	511	0.10	Prouty, Stanley D. & Kathryn L.
2 N	10 E	WM	29	NW SW	600	2.00	Reichel, Douglas J.
2 N	10 E	WM	29	SW SW	600	1.80	Reichel, Douglas J.
2 N	10 E	WM	29	SW SW	900	2.00	Hill, Robert M.
2 N	10 E	WM	30	SE SE	900	0.25	Petty, Leta E.
2 N	10 E	WM	33	NE NW		0.60	Golden Mountain, LLC (see map 2 N 10 E Sec 28 TL 2903)
2 N	10 E	WM	34	NE NE	101	2.20	Evans, David O. & Polly
2 N	10 E	WM	34	SE NE	101	0.40	Evans, David O. & Polly
2 N	10 E	WM	34	SE NW	1700	1.00	Arnold, Richard J. & Charlotte S.
2 N	10 E	WM	34	SW SW	3502	3.60	Wild, David W. & Reolla J.
2 N	10 E	WM	35	SE NE	200	19.20	Yasui, Philip
2 N	10 E	WM	35	SE NE	300	0.70	Yasui, Philip
2 N	10 E	WM	35	SW NE	500	1.00	Tamura Orchards, Inc.
2 N	10 E	WM	35	NW SE	3500	0.50	Munos, Jess K.
2 N	10 E	WM	36	NE NE	100	1.30	Sheirbon, Gerald
2 N	10 E	WM	36	NE NE	300	1.80	Sawyer, Thomas E. & Ellen H.
2 N	10 E	WM	36	NE NE	301	2.00	Dominguez, Fred & Traci
2 N	10 E	WM	36	NE NE	302	1.00	Weekly, Christopher E. & Christy D.
2 N	10 E	WM	36	SE NE	600	9.00	Gehrig, Ronald J. & Sherryl N.
2 N	10 E	WM	36	SE NE	800	6.00	Moore, Sally
2 N	10 E	WM	36	SW NE	1002	0.50	Dunn, Amy & Steve
2 N	10 E	WM	36	SW NE	1100	1.00	O'Neill, Karen J. & Heinemann, Nigel
2 N	10 E	WM	36	NW NE	1200	6.00	Collins, Reva Revocable Living Trust
2 N	10 E	WM	36	NW NE	1301	0.80	Collins, Reva Revocable Living Trust
2 N	10 E	WM	36	NW NE	1500	5.00	Marquis, Howard R. & Erlinda G.
2 N	10 E	WM	36 (DA)	NE SE	1000	4.00	Cederstam, Eric R.
2 N	11 E	WM	6	SW NW	1201	1.70	Lariza Orchards, Inc.
2 N	11 E	WM	6	SW NW	1400	3.00	Hood River County Forestry Dept. - Panorama Pt.
2 N	11 E	WM	6	SW NW	1600	0.30	Arechaga, Susan M.
2 N	11 E	WM	6	SE NW	1700	1.00	Corelli, Patrick D.
2 N	11 E	WM	6	SW NW	1800	0.15	Ing, George & Muriel
2 N	11 E	WM	6	SE NW	1800	2.80	Ing, George & Muriel
2 N	11 E	WM	6	NE SW	1901	3.40	Ing, George & Muriel

2 N	11 E	WM	7	NE NE	200	1.50	Rabin, Michelle B. & Bushberg, Sandy M.
2 N	11 E	WM	7	NE NE	201	0.50	Jenkins, Lee J.
2 N	11 E	WM	7	NW NE	300	2.00	Phyllis A. Nafsinger Living Trust
2 N	11 E	WM	19	NE NE	101	2.50	Waller, David P. & Nancy Jo
2 N	11 E	WM	19	SE NE	400	5.20	Viewmont Orchards, LLC
2 N	11 E	WM	19	NW SW	2601	0.30	Fir Mt. Orchard Company
2 N	11 E	WM	19	NW SE	3300	3.50	Swyers, George M.
2 N	11 E	WM	19	SW SE	3300	6.10	Swyers, George M.
2 N	11 E	WM	30	NW NE	200	1.60	Laughlin, Loretta
2 N	11 E	WM	30	SW NE	400	0.30	Shelton, Paul & Norma E.
2 N	11 E	WM	30	SE NW	700	11.50	Elk Mountain, LLC
2 N	11 E	WM	30	NW SW	1600	2.70	Spengler, Steven G. & Wilma R.
3 N	11 E	WM	31	NW SE	900	3.00	Wells, Gary W. & Maureen F. U-4
3 N	11 E	WM	31 (B)	NE NW	300	1.00	Bryant, John C.
3 N	11 E	WM	31 (B)	NE NW	301	0.35	Bryant, C. Ann
3 N	11 E	WM	31 (B)	NE NW	401	1.00	Hull, Donald W.
3 N	11 E	WM	31 (B)	NW NW	600	0.15	Brown, Gerald & Dawn
3 N	11 E	WM	31 (B)	NE NW	1406	0.50	Tveidt, Carroll & Ferne J.
3 N	11 E	WM	31 (B)	NW NW	1408	0.20	Charest, Thomas B.
3 N	11 E	WM	31 (B)	NE NW	3002	0.25	Wood, John M.
3 N	11 E	WM	31 (B)	SE NW	3002	0.45	Wood, John M.
3 N	11 E	WM	31 (B)	NE NW	3004	0.30	Kelly, Daniel J.
3 N	11 E	WM	31 (B)	SE NW	3004	0.30	Kelly, Daniel J.
3 N	11 E	WM	31 (C)	SW SW	100	1.80	Cheatham, J. North
3 N	11 E	WM	31 (C)	SE SW	100	1.20	Cheatham, J. North
3 N	11 E	WM	31 (C)	NW SW	1400	0.80	McKenzie-Sherpa, Maureen & McKenzie, Mike
3 N	11 E	WM	31 (C)	SW SW	1400	1.70	McKenzie-Sherpa, Maureen & McKenzie, Mike
3 N	11 E	WM	31 (C)	SE SW	1700	0.80	Lariza Orchards, Inc.
3 N	11 E	WM	31 (C)	SE SW	1800	4.70	Kroeger, Michael W.

TOTAL ACRES: 405.00

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described.

The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued SEP 03 2008.

Dwight French for
Phillip C. Ward, Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 84803 .

56365.RA

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
PO BOX 162
ODELL OR 97044

confirms the right to use the waters of EAST FORK HOOD RIVER, tributary to HOOD RIVER for IRRIGATION of 8.8 ACRES.

This right was confirmed by decree of the Circuit Court of the State of Oregon for Hood River County. The decree is of record at Salem, in the Order Record of the Water Resources Director in Volume 17, at Page 333. The date of priority is NOVEMBER 25, 1895.

The amount of water to which this right is entitled is limited to an amount actually used beneficially, and shall not exceed 0.11 CUBIC FOOT PER SECOND, or its equivalent in case of rotation, measured at the point of diversion.

The point of diversion is located as follows:

Twp	Rng	Mer	Sec	Q-Q	GLot	DLC	Measured Distances
1 S	10 E	WM	4	NW SW			3750 FEET SOUTH AND 430 FEET EAST FROM NW CORNER, SECTION 4

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use is as follows:

Twp	Rng	Mer	Sec	Q-Q	GLot	Acres	Tax Lot
1 N	10 E	WM	22	SW NE	7	1.243	401
1 N	10 E	WM	22	SW NE	7	2.485	402
1 N	10 E	WM	22	SW NE	7	0.100	403
1 N	10 E	WM	22	SW NE	7	1.243	405
1 N	10 E	WM	22	SW NE	7	1.243	406
1 N	10 E	WM	22	SW NE	7	1.243	407
1 N	10 E	WM	22	SW NE	7	1.243	408

This certificate is issued to confirm a change in PLACE OF USE approved by an order of the Water Resources Director entered JULY 7, 1997, at Special Order Volume 51, Page 625, approving Transfer Application 7523, and together with Certificate 74642, supercedes Certificate 46952, State Record of Water Right Certificates.

NOTICE OF RIGHT TO PETITION FOR RECONSIDERATION OR JUDICIAL REVIEW

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482. Pursuant to ORS 183.482, ORS 536.075 and OAR 137-003-0675, you may petition for judicial review and petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

The right to the use of the water for the above purpose is restricted to beneficial use on place of use described, and is subject to all other conditions and limitations contained in said decree.

Issued JUN 20 2013.

Dwight W. French
Administrator, Water Right Services, for
Phillip C. Ward, Director

 Recorded in State Record of Water Right Certificates numbered 88094.

STATE OF OREGON

COUNTY OF HOOD RIVER

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

EAST FORK IRRIGATION DISTRICT
PO BOX 162
ODELL, OR 97044

confirms the right to use the waters of EAST FORK HOOD RIVER, tributary to HOOD RIVER, for IRRIGATION of 8,521.99 ACRES, 9.78 ACRES INCHOATE, and 15.0 ACRES EQUIVALENT INDUSTRIAL.

This right was confirmed by decree of the Circuit Court of the State of Oregon for Hood River County. The decree is of record at Salem, in the Order Record of the Water Resources Director, in Volume 17 at Page 333. The date of priority is NOVEMBER 25, 1895.

The amount of water to which this right is entitled is limited to an amount actually used beneficially, and shall not exceed 104.20 CUBIC FOOT PER SECOND (CFS), being 103.90 CFS for IRRIGATION, 0.12 CFS for INCHOATE ACRES, and 0.18 CFS for INDUSTRIAL USE, or the equivalent in case of rotation, measured at the point of diversion from the source.

The amount of water used for irrigation, is limited to a diversion of 1/80 of one cubic foot per second, or its equivalent for each acre irrigated, and shall be further limited to a diversion of not to exceed 3.0 acre-feet per acre for each acre irrigated during the irrigation season of each year, and an annual volume limitation of 24,817.38 ACRE-FEET per year.

The point of diversion is located as follows:

Twp	Rng	Mer	Sec	Q-Q	GLot	Measured Distances
1 S	10 E	WM	4	NW SW	1	3750 FEET SOUTH AND 430 FEET EAST FROM THE NW CORNER OF SECTION 4

A description of the place of use to which this right is appurtenant is as follows:

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
1 N	10 E	WM	1	NE NE	1	5.65		
1 N	10 E	WM	1	NW NE	2	18.00		
1 N	10 E	WM	1	SW NE		16.25		
1 N	10 E	WM	1	SE NE		27.10		
1 N	10 E	WM	1	NE NW	3	8.00		
1 N	10 E	WM	1	NW NW	4	32.20		
1 N	10 E	WM	1	SW NW		40.00		
1 N	10 E	WM	1	SE NW		14.20		

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
1 N	10 E	WM	1	NE SW		33.60		
1 N	10 E	WM	1	NW SW		36.40		
1 N	10 E	WM	1	SW SW		3.40		
1 N	10 E	WM	1	SE SW		10.00		
1 N	10 E	WM	1	NW SE		7.80		
1 N	10 E	WM	2	NE NE	1	32.00		
1 N	10 E	WM	2	NW NE	2	27.00		
1 N	10 E	WM	2	SW NE		34.80		
1 N	10 E	WM	2	SE NE		36.40		
1 N	10 E	WM	2	NE NW	3	30.20		
1 N	10 E	WM	2	NW NW	4	28.80		
1 N	10 E	WM	2	SW NW		2.80		
1 N	10 E	WM	2	SE NW		7.50		
1 N	10 E	WM	2	NE SW		2.40		
1 N	10 E	WM	2	NE SE		25.20		
1 N	10 E	WM	2	NW SE		0.30		
1 N	10 E	WM	2	SE SE		0.90		
1 N	10 E	WM	3	NE NE	1	32.20		
1 N	10 E	WM	3	NW NE	2	36.50		
1 N	10 E	WM	3	SW NE	7	24.00		
1 N	10 E	WM	3	SW NE	7		1.00	T-11682
1 N	10 E	WM	3	SE NE	8	6.20		
1 N	10 E	WM	3	NE NW	3	24.80		
1 N	10 E	WM	3	NW NW	4	23.70		
1 N	10 E	WM	3	SW NW	5	16.40		
1 N	10 E	WM	3	SE NW	6	5.40		
1 N	10 E	WM	3	NE SW	11	2.60		
1 N	10 E	WM	3	NE SW	9	3.20		
1 N	10 E	WM	3	NW SW	12	7.20		
1 N	10 E	WM	3	NW SE	10	8.60		
1 N	10 E	WM	3	SE SE	16	0.60		
1 N	10 E	WM	10	NE NE	1	1.40		
1 N	10 E	WM	10	NW NE	2	14.00		
1 N	10 E	WM	10	SE NE	8	7.82		
1 N	10 E	WM	10	NE NW	4	25.80		
1 N	10 E	WM	10	NW NW	4	3.90		
1 N	10 E	WM	10	SW NW	5	0.50		
1 N	10 E	WM	10	SE NW	6	0.10		
1 N	10 E	WM	10	NE SE	9	8.10		
1 N	10 E	WM	10	NW SE	10	2.00		
1 N	10 E	WM	10	NW SE	10	1.60		
1 N	10 E	WM	10	SW SE	15	0.90		
1 N	10 E	WM	10	SE SE	16	2.60		

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
1 N	10 E	WM	11	SW NE		28.40		
1 N	10 E	WM	11	SE NE		5.20		
1 N	10 E	WM	11	SE NW		6.40		
1 N	10 E	WM	11	NE SW		1.00		
1 N	10 E	WM	11	NE SW	6	0.40		
1 N	10 E	WM	11	SW SW		3.00		
1 N	10 E	WM	11	SE SW		13.40		
1 N	10 E	WM	11	NE SE		6.40		
1 N	10 E	WM	11	NW SE		38.70		
1 N	10 E	WM	15	NE NE	1	28.80		
1 N	10 E	WM	15	NW NE	2	6.80		
1 N	10 E	WM	15	NW NE		0.25		
1 N	10 E	WM	15	NW NE		0.10		
1 N	10 E	WM	15	SW NE	7	14.75		
1 N	10 E	WM	15	SW NE	7	1.45		
1 N	10 E	WM	15	SW NE		0.15		
1 N	10 E	WM	15	SW NE		0.05		
1 N	10 E	WM	15	SW NE		0.05		
1 N	10 E	WM	15	SE NE	8	15.50		
1 N	10 E	WM	15	SE NW	6	6.50		
1 N	10 E	WM	15	SE NW	6	1.50		
1 N	10 E	WM	15	SE SW	14	32.00		
1 N	10 E	WM	15	NE SE	9	3.70		
1 N	10 E	WM	15	NW SE	10	8.50		
1 N	10 E	WM	15	NW SE		0.50		
1 N	10 E	WM	15	NW SE		1.50		
1 N	10 E	WM	15	SW SE	15	27.20		
1 N	10 E	WM	15	SE SE	16	2.60		
1 N	10 E	WM	22	NW NE	2	26.20		
1 N	10 E	WM	22	SW NE	7	1.00		
1 N	10 E	WM	22	NE NW	3	27.65		
1 N	10 E	WM	22	SE NW	6	27.15		
1 N	10 E	WM	22	NW SE	10	19.20		
1 N	10 E	WM	22	SW SE	15	10.00		
1 N	10 E	WM	27	NW NE	2	16.60		
1 N	11 E	WM	6	NW NW	4	2.00		
1 N	11 E	WM	6	SW NW	5	1.10		
1 N	11 E	WM	6	SW NW		1.00		
2 N	10 E	WM	1	SE NE		19.70		
2 N	10 E	WM	1	NE SE		15.80		
2 N	10 E	WM	1	SE SE		16.60		
2 N	10 E	WM	12	NE NE		34.20		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	10	E	WM	12	NW	NE		9.00		
2	N	10	E	WM	12	SW	NE		18.60		
2	N	10	E	WM	12	SE	NE		30.40		
2	N	10	E	WM	12	SE	NW		6.20		
2	N	10	E	WM	12	NE	SW		19.00		
2	N	10	E	WM	12	SW	SW		0.30		
2	N	10	E	WM	12	SE	SW		32.60		
2	N	10	E	WM	12	NE	SE		38.20		
2	N	10	E	WM	12	NW	SE		29.50		
2	N	10	E	WM	12	NW	SE			1.20	T-11682
2	N	10	E	WM	12	SW	SE		37.70		
2	N	10	E	WM	12	SE	SE		32.80		
2	N	10	E	WM	13	NE	NE		7.20		
2	N	10	E	WM	13	NW	NE		40.00		
2	N	10	E	WM	13	SW	NE		37.60		
2	N	10	E	WM	13	SE	NE		31.20		
2	N	10	E	WM	13	NE	NW		37.40		
2	N	10	E	WM	13	NW	NW		31.40		
2	N	10	E	WM	13	SW	NW		22.20		
2	N	10	E	WM	13	SE	NW		38.40		
2	N	10	E	WM	13	NE	SW		30.90		
2	N	10	E	WM	13	NW	SW		18.30		
2	N	10	E	WM	13	SW	SW		34.50		
2	N	10	E	WM	13	SE	SW		18.70		
2	N	10	E	WM	13	NE	SE		37.60		
2	N	10	E	WM	13	NW	SE		32.40		
2	N	10	E	WM	13	SW	SE		31.00		
2	N	10	E	WM	13	SE	SE		37.00		
2	N	10	E	WM	14	SW	NE		13.50		
2	N	10	E	WM	14	SW	NE			0.20	T-11682
2	N	10	E	WM	14	SE	NE		24.60		
2	N	10	E	WM	14	SE	NW		0.90		
2	N	10	E	WM	14	SE	NW			1.10	T-11682
2	N	10	E	WM	14	NE	SW		22.00		
2	N	10	E	WM	14	NE	SW			0.10	T-11682
2	N	10	E	WM	14	NE	SW			0.70	T-11682
2	N	10	E	WM	14	NW	SW		0.80		
2	N	10	E	WM	14	SW	SW		10.20		

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
2 N	10 E	WM	14	SE SW		30.80		
2 N	10 E	WM	14	NE SE		31.60		
2 N	10 E	WM	14	NW SE		33.90		
2 N	10 E	WM	14	NW SE			0.60	T-11682
2 N	10 E	WM	14	SW SE		36.50		
2 N	10 E	WM	14	SE SE		38.00		
2 N	10 E	WM	15	NE SE		0.40		
2 N	10 E	WM	15	SW SE		10.60		
2 N	10 E	WM	15	SE SE		33.20		
2 N	10 E	WM	16	SW SE		4.00		
2 N	10 E	WM	16	SE SE		0.60		
2 N	10 E	WM	20	NE SE		12.20		
2 N	10 E	WM	20	SW SE		13.20		
2 N	10 E	WM	20	SE SE		25.80		
2 N	10 E	WM	21	NE NE		15.60		
2 N	10 E	WM	21	NW NE		20.60		
2 N	10 E	WM	21	SW NE		39.50		
2 N	10 E	WM	21	SE NE		38.00		
2 N	10 E	WM	21	NE NW		3.40		
2 N	10 E	WM	21	SW NW		12.80		
2 N	10 E	WM	21	SE NW		22.40		
2 N	10 E	WM	21	NE SW		18.50		
2 N	10 E	WM	21	NW SW		37.40		
2 N	10 E	WM	21	SW SW		12.40		
2 N	10 E	WM	21	SE SW		22.50		
2 N	10 E	WM	21	NE SE		39.80		
2 N	10 E	WM	21	NW SE		38.50		
2 N	10 E	WM	21	SW SE		34.00		
2 N	10 E	WM	21	SE SE		39.00		
2 N	10 E	WM	22	NE NE		26.00		
2 N	10 E	WM	22	NW NE		38.80		
2 N	10 E	WM	22	SW NE		36.10		
2 N	10 E	WM	22	SE NE		29.80		
2 N	10 E	WM	22	NE NW		33.20		
2 N	10 E	WM	22	NW NW		30.20		
2 N	10 E	WM	22	SW NW		39.80		
2 N	10 E	WM	22	SE NW		38.00		
2 N	10 E	WM	22	NE SW		36.30		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	10	E	WM	22	NW	SW		39.20		
2	N	10	E	WM	22	SW	SW		38.40		
2	N	10	E	WM	22	SE	SW		38.00		
2	N	10	E	WM	22	NE	SE		38.20		
2	N	10	E	WM	22	NW	SE		33.80		
2	N	10	E	WM	22	SW	SE		38.40		
2	N	10	E	WM	22	SE	SE		38.00		
2	N	10	E	WM	23	NE	NE		41.40		
2	N	10	E	WM	23	NW	NE		41.20		
2	N	10	E	WM	23	SW	NE		40.00		
2	N	10	E	WM	23	SE	NE		40.00		
2	N	10	E	WM	23	NE	NW		38.80		
2	N	10	E	WM	23	NW	NW		31.80		
2	N	10	E	WM	23	SW	NW		33.60		
2	N	10	E	WM	23	SE	NW		38.20		
2	N	10	E	WM	23	NE	SW		40.00		
2	N	10	E	WM	23	NW	SW		14.20		
2	N	10	E	WM	23	SW	SW		25.40		
2	N	10	E	WM	23	SE	SW		40.00		
2	N	10	E	WM	23	NE	SE		38.80		
2	N	10	E	WM	23	NW	SE		39.70		
2	N	10	E	WM	23	SW	SE		36.80		
2	N	10	E	WM	23	SE	SE		39.40		
2	N	10	E	WM	24	NE	NE		37.40		
2	N	10	E	WM	24	NW	NE		25.60		
2	N	10	E	WM	24	SW	NE		30.60		
2	N	10	E	WM	24	SE	NE		34.80		
2	N	10	E	WM	24	NE	NW		23.40		
2	N	10	E	WM	24	NW	NW		40.20		
2	N	10	E	WM	24	SW	NW		36.40		
2	N	10	E	WM	24	SE	NW		16.80		
2	N	10	E	WM	24	SE	NW			0.30	T-11682
2	N	10	E	WM	24	NE	SW		26.60		
2	N	10	E	WM	24	NW	SW		29.60		
2	N	10	E	WM	24	SW	SW		31.20		
2	N	10	E	WM	24	SE	SW		33.50		
2	N	10	E	WM	24	NE	SE		36.60		
2	N	10	E	WM	24	NW	SE		17.00		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	10	E	WM	24	SW	SE		9.10		
2	N	10	E	WM	24	SE	SE		32.00		
2	N	10	E	WM	25	NE	NE		18.60		
2	N	10	E	WM	25	NW	NE		13.00		
2	N	10	E	WM	25	SE	NE		4.00		
2	N	10	E	WM	25	NE	NW		38.80		
2	N	10	E	WM	25	NW	NW		31.80		
2	N	10	E	WM	25	SW	NW		8.00		
2	N	10	E	WM	25	SW	NW		0.15		
2	N	10	E	WM	25	SE	NW		9.05		
2	N	10	E	WM	25	SE	NW	6	0.45		
2	N	10	E	WM	25	SE	NW		0.30		
2	N	10	E	WM	25	SE	NW		0.10		
2	N	10	E	WM	25	NE	SW		32.70		
2	N	10	E	WM	25	NW	SW		9.70		
2	N	10	E	WM	25	SW	SW		12.60		
2	N	10	E	WM	25	NW	SE		18.40		
2	N	10	E	WM	25	SW	SE		11.00		
2	N	10	E	WM	25	SE	SE		24.30		
2	N	10	E	WM	26	NE	NE		33.00		
2	N	10	E	WM	26	NW	NE		8.80		
2	N	10	E	WM	26	SW	NE		38.00		
2	N	10	E	WM	26	SE	NE		37.85		
2	N	10	E	WM	26	NE	NW		36.70		
2	N	10	E	WM	26	NW	NW		26.98		
2	N	10	E	WM	26	SW	NW		6.71		
2	N	10	E	WM	26	SW	NW		0.25		
2	N	10	E	WM	26	SE	NW		24.18		
2	N	10	E	WM	26	SW	SW		12.80		
2	N	10	E	WM	26	SE	SW		36.60		
2	N	10	E	WM	26	NE	SE		13.15		
2	N	10	E	WM	26	SW	SE		31.80		
2	N	10	E	WM	26	SE	SE		24.10		
2	N	10	E	WM	27	NE	NE		10.60		
2	N	10	E	WM	27	NW	NE		21.50		
2	N	10	E	WM	27	SW	NE		6.00		
2	N	10	E	WM	27	SE	NE		5.00		
2	N	10	E	WM	27	NE	NW		8.00		
2	N	10	E	WM	27	NW	NW		24.60		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	10	E	WM	27	SW	NW		26.40		
2	N	10	E	WM	27	SE	NW		14.40		
2	N	10	E	WM	27	NE	SW		11.80		
2	N	10	E	WM	27	NW	SW		22.00		
2	N	10	E	WM	27	SW	SW		7.60		
2	N	10	E	WM	27	SE	SW		16.60		
2	N	10	E	WM	27	NE	SE		33.10		
2	N	10	E	WM	27	NW	SE		38.70		
2	N	10	E	WM	27	SW	SE		30.80		
2	N	10	E	WM	27	SE	SE		30.00		
2	N	10	E	WM	28	NE	NE		31.50		
2	N	10	E	WM	28	NW	NE		34.00		
2	N	10	E	WM	28	SW	NE		29.40		
2	N	10	E	WM	28	SE	NE		31.40		
2	N	10	E	WM	28	NE	NW		6.40		
2	N	10	E	WM	28	NE	SE		13.20		
2	N	10	E	WM	28	NW	SE		24.00		
2	N	10	E	WM	28	SW	SE		11.80		
2	N	10	E	WM	28	SE	SE		11.20		
2	N	10	E	WM	29	NE	NE		2.70		
2	N	10	E	WM	29	NW	NE		28.60		
2	N	10	E	WM	29	SW	NE		1.00		
2	N	10	E	WM	29	NE	NW		6.80		
2	N	10	E	WM	29	SE	NW		19.60		
2	N	10	E	WM	29	NW	SW		7.80		
2	N	10	E	WM	29	SW	SW		1.40		
2	N	10	E	WM	29	SW	SW	13	0.50		
2	N	10	E	WM	30	NE	SE		6.80		
2	N	10	E	WM	30	SE	SE		6.00		
2	N	10	E	WM	33	NE	SE		0.10		
2	N	10	E	WM	34	NE	NE		25.80		
2	N	10	E	WM	34	NW	NE		37.40		
2	N	10	E	WM	34	SW	NE		37.50		
2	N	10	E	WM	34	SE	NE		32.90		
2	N	10	E	WM	34	NE	NW		13.70		
2	N	10	E	WM	34	NW	NW		4.90		
2	N	10	E	WM	34	SW	NW		19.00		
2	N	10	E	WM	34	SE	NW		5.40		
2	N	10	E	WM	34	NE	SW		28.20		

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
2 N	10 E	WM	34	NW SW		26.10		
2 N	10 E	WM	34	SW SW		27.00		
2 N	10 E	WM	34	SE SW		37.70		
2 N	10 E	WM	34	NE SE		33.80		
2 N	10 E	WM	34	NW SE		32.40		
2 N	10 E	WM	34	SW SE		38.80		
2 N	10 E	WM	34	SE SE		38.30		
2 N	10 E	WM	35	NE NE		36.60		
2 N	10 E	WM	35	NW NE		23.90		
2 N	10 E	WM	35	SW NE		13.40		
2 N	10 E	WM	35	SE NE		3.70		
2 N	10 E	WM	35	NE NW		27.50		
2 N	10 E	WM	35	NW NW		16.40		
2 N	10 E	WM	35	SW NW		38.60		
2 N	10 E	WM	35	SE NW		25.20		
2 N	10 E	WM	35	NE SW		33.00		
2 N	10 E	WM	35	NW SW		36.70		
2 N	10 E	WM	35	SW SW		32.20		
2 N	10 E	WM	35	SE SW		30.00		
2 N	10 E	WM	35	NE SE		37.80		
2 N	10 E	WM	35	NW SE		34.30		
2 N	10 E	WM	35	SW SE		38.00		
2 N	10 E	WM	35	SE SE		34.40		
2 N	10 E	WM	36	NE NE		12.80		
2 N	10 E	WM	36	NW NE		17.40		
2 N	10 E	WM	36	SE NE		21.00		
2 N	10 E	WM	36	NE NW		35.20		
2 N	10 E	WM	36	NW NW		29.20		
2 N	10 E	WM	36	SW NW		19.20		
2 N	10 E	WM	36	SE NW		24.20		
2 N	10 E	WM	36	NE SW		9.80		
2 N	10 E	WM	36	NW SW		22.20		
2 N	10 E	WM	36	SW SW		39.20		
2 N	10 E	WM	36	SE SW		28.00		
2 N	10 E	WM	36	NE SE		0.80		
2 N	10 E	WM	36	NW SE		1.60		
2 N	10 E	WM	36	SW SE		23.80		
2 N	10 E	WM	36	SE SE		0.70		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	10	E	WM	36	SE	SE		1.40		
2	N	11	E	WM	6	NW	NE		10.80		
2	N	11	E	WM	6	SW	NE		1.80		
2	N	11	E	WM	6	NE	NW		38.40		
2	N	11	E	WM	6	NW	NW		23.60		
2	N	11	E	WM	6	SW	NW		21.30		
2	N	11	E	WM	6	SE	NW		23.90	0.58	T-11910
2	N	11	E	WM	6	NE	SW		26.50		
2	N	11	E	WM	6	NW	SW		37.00		
2	N	11	E	WM	6	SW	SW		32.00		
2	N	11	E	WM	6	SE	SW		33.40		
2	N	11	E	WM	6	NW	SE			1.00	T-11682
2	N	11	E	WM	6	SW	SE		9.80		
2	N	11	E	WM	6	SW	SE			0.40	T-11682
2	N	11	E	WM	6	SW	SE			0.20	T-11682
2	N	11	E	WM	7	NE	NE		9.20		
2	N	11	E	WM	7	NE	NE		0.50		
2	N	11	E	WM	7	NW	NE		18.60		
2	N	11	E	WM	7	SW	NE		36.90		
2	N	11	E	WM	7	SE	NE		7.60		
2	N	11	E	WM	7	NE	NW		36.40		
2	N	11	E	WM	7	NW	NW		38.60		
2	N	11	E	WM	7	SW	NW		39.80		
2	N	11	E	WM	7	SE	NW		40.00		
2	N	11	E	WM	7	NE	SW		39.80		
2	N	11	E	WM	7	NW	SW		38.00		
2	N	11	E	WM	7	SW	SW		38.40		
2	N	11	E	WM	7	SW	SW		0.70		
2	N	11	E	WM	7	SE	SW		38.80		
2	N	11	E	WM	7	NE	SE		5.40		
2	N	11	E	WM	7	NW	SE		40.00		
2	N	11	E	WM	7	SW	SE		39.00		
2	N	11	E	WM	7	SE	SE		3.40		
2	N	11	E	WM	18	NE	NE		24.60		
2	N	11	E	WM	18	NW	NE		30.80		
2	N	11	E	WM	18	NW	NE		1.20		
2	N	11	E	WM	18	SW	NE		26.60		
2	N	11	E	WM	18	SW	NE		3.30		

Twp		Range		Mer	Sec	Q	Q	GLot	Acres	Inchoate	Transfer
2	N	11	E	WM	18	SE	NE		23.20		
2	N	11	E	WM	18	NE	NW		38.20		
2	N	11	E	WM	18	NW	NW		39.80		
2	N	11	E	WM	18	SW	NW		35.80		
2	N	11	E	WM	18	SE	NW		38.80		
2	N	11	E	WM	18	SE	NW		0.70		
2	N	11	E	WM	18	NE	SW		38.40		
2	N	11	E	WM	18	NW	SW		38.80		
2	N	11	E	WM	18	SW	SW		35.00		
2	N	11	E	WM	18	SE	SW		33.90		
2	N	11	E	WM	18	NE	SE		27.00		
2	N	11	E	WM	18	NW	SE		39.20		
2	N	11	E	WM	18	SW	SE		37.40		
2	N	11	E	WM	18	SE	SE		28.20		
2	N	11	E	WM	19	NE	NE		4.95		
2	N	11	E	WM	19	NW	NE		32.60		
2	N	11	E	WM	19	SW	NE		33.40		
2	N	11	E	WM	19	SE	NE		2.80		
2	N	11	E	WM	19	NE	NW		25.40		
2	N	11	E	WM	19	NW	NW		33.40		
2	N	11	E	WM	19	SW	NW		33.00		
2	N	11	E	WM	19	SE	NW		33.10		
2	N	11	E	WM	19	NE	SW		21.60		
2	N	11	E	WM	19	NW	SW		36.40		
2	N	11	E	WM	19	SW	SW		38.40		
2	N	11	E	WM	19	SE	SW		30.60		
2	N	11	E	WM	19	NE	SE		4.20		
2	N	11	E	WM	19	NW	SE		34.20		
2	N	11	E	WM	19	SW	SE		18.40		
2	N	11	E	WM	30	NW	NE		4.40		
2	N	11	E	WM	30	SW	NE		2.60		
2	N	11	E	WM	30	NE	NW		18.80		
2	N	11	E	WM	30	NW	NW		32.00		
2	N	11	E	WM	30	NW	NW			0.70	T-11682
2	N	11	E	WM	30	SW	NW		32.35		
2	N	11	E	WM	30	SW	NW			0.30	T-11682
2	N	11	E	WM	30	SE	NW		13.00		
2	N	11	E	WM	30	NW	SW		18.80		

Twp	Range	Mer	Sec	Q Q	GLot	Acres	Inchoate	Transfer
3 N	10 E	WM	36	SE NE		14.20		
3 N	10 E	WM	36	NE SE		4.40		
3 N	11 E	WM	31	NW NE		8.90		
3 N	11 E	WM	31	NE NW		4.00		
3 N	11 E	WM	31	NE NW	2	6.10		T-11910
3 N	11 E	WM	31	NE NW		2.00		
3 N	11 E	WM	31	NE NW		0.80		
3 N	11 E	WM	31	NE NW		0.20		
3 N	11 E	WM	31	NW NW	3	0.40		
3 N	11 E	WM	31	SW NW		5.40	0.30	T-11910
3 N	11 E	WM	31	SE NW		9.20	0.50	T-11910
3 N	11 E	WM	31	NE SW		19.60		
3 N	11 E	WM	31	NW SW		9.90		
3 N	11 E	WM	31	NW SW		0.30		
3 N	11 E	WM	31	SW SW		10.70		
3 N	11 E	WM	31	SE SW		15.10		
3 N	11 E	WM	31	SE SW			0.60	T-11682
					TOTALS	8,521.99	9.78	

INDUSTRIAL						
Township	Range	Mer	Sec	Q Q	GLot	Acres Equivalent
1 N	10 E	WM	10	SE NE	8	15.00
1 N	10 E	WM	10	NE SE	9	
1 N	10 E	WM	11	NW NW		
1 N	10 E	WM	11	SW NW		
1 N	10 E	WM	11	NW SW		

This certificate describes the water right confirmed by Certificate 81340 State Record of Water Right Certificates, REDUCED IN RATE by the provisions of an order of the Water Resources Director entered OCT 21 2016, approving and finalizing Allocation of Conserved Water CW-86, and confirms the Department's determination of satisfactory proof of completion of changes authorized by orders of the Director as listed in Table 1 below. This Certificate together with Certificate 91999, supersedes Certificate 81340.

TABLE 1 WATER RIGHT ACTIONS INCORPORATED BY THIS CERTIFICATE				
Transaction File #	Water Right Action	Order Date	Special Order	
			Volume	Page
CW-53	Conserved Water	12/30/2009	79	1278
T-9129	Transfer	1/30/2015	93	1195
T-9609	Transfer	10/6/2010	82	46
T-9804	Transfer	10/6/2010	82	42
T-10254	Transfer	10/6/2010	82	44
T-10416	Transfer	9/1/2010	81	806
T-10748	Transfer	10/3/2011	85	492
T-10972	Transfer	4/10/2013	89	734
T-11165	Transfer	1/30/2015	93	1193
T-11317	Transfer	5/26/2015	95	856
T-11643	Transfer	11/24/2015	98	382

In addition, this Certificate includes the remaining portion of the water right described by Certificate 81340, State Record of Water Right Certificates, NOT modified by the provisions of orders of the Water Resources Director approving Transfer Applications: 1) T-11682, recorded on March 20, 2014, in Special Order Volume 91, Page 1007; and 2) T-11910, recorded on December 9, 2014, recorded in Special Order Volume 93, Page 934.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described and is subject to all other conditions and limitations contained in said decree.

WITNESS the signature of the Water Resources Director, affixed OCT 21 2016.

Dwight French, Water Right Services Administrator for
THOMAS M. BYLER, DIRECTOR

Appendix C
Water Loss Assessment

Water Loss Assessment

East Fork Irrigation District

Prepared by:
Matt Melchiorsen
Farmers Conservation Alliance

Prepared for:
East Fork Irrigation District
3500 Graves Road
Hood River, Oregon 97031

May 2018

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Section 1
Introduction

Over the last 13 years, several studies have been conducted by numerous groups within the EFID, to quantify potential water losses throughout the delivery system. These investigations focused primarily on two sources of water loss: seepage (infiltration) and excess end spills. End spills are points throughout irrigation ditch where excess water is spilled into a ditch, creek, stream, or river. End spills are located at the termination of a canal or lateral to ensure the canal continually has enough water for patrons. End spills are losses in the system because the water must be diverted from the river and is not used directly to irrigate crops. The EFID staff monitors and adjusts these end spills daily to reduce the amount of water lost. This can be tricky as the patrons turn on and off throughout the lateral. A minimum end spill flow must be maintained in the case that all patrons are using water at the same time.

The purpose of the water loss assessment, is to summarize findings from five selected individual studies, and to consolidate results into an overview for future dissemination. This loss assessment will not cover a system wide extrapolation of water loss, given the limited nature of total system data availability, and the somewhat inconclusive results from many of the studies. The following reports and/or data summaries were used to compile this summary:

1. Oregon Water Resources Department, Jonathan La Marche, Central Lateral Canal Seepage Study (August 2004) and Neal Creek Cutoff Seepage Study (June 2005).

2. Dan Kleinsmith, FCA, Seepage study along the Eastside Canal (August-September 2015).

3. Mark Wharry, KPFF Consulting Engineers, System Improvement Plan (January 2016)

4. Dan Kleinsmith, FCA, End spill data collection and analysis using HOBO submersible pressure transducers (June-October 2016) and (May-October 2017)

5. GMA Hydrology Inc. Seepage Study (October 2017)

Section 2
Methodology

2.1 OWRD CENTRAL LATERAL CANAL SEEPAGE STUDY (2004) AND NEAL CREEK CUTOFF SEEPAGE STUDY (2005)

Jonathan LaMarche, Oregon Water Resources Department Hydrologist, conducted seepage studies in 2004 and 2005 on the Central Lateral Canal and Neal Creek Cutoff, respectively. Potential water losses due to a combination of seepage, evaporation, and evapotranspiration were determined using the 'inflow-outflow method.' Direct measurements of discharge were obtained at preselected transects along sections the Central Lateral Canal and Neal Creek Cutoff Canal, and any gains and/or losses were computed using Equation 1:

$$Q_\Delta = Q_{upstream} + \sum_{i=1}^{n} Q_{inflow,i} - \sum_{j=1}^{m} Q_{diversion,i} - Q_{downstream}$$

Q_Δ	= Change in canal discharge (i.e., gain or loss)
$Q_{upstream}$	= Upstream discharge in canal
$Q_{downstream}$	= Downstream discharge in canal
$Q_{inflow,i}$	= Inflow discharge at location i
$Q_{diversion,j}$	= Diversion discharge at location j
n	= total number of $Q_{inflow,i}$ between $Q_{upstream}$ and $Q_{downstream}$
m	= total number of $Q_{diversion,j}$ between $Q_{upstream}$ and $Q_{downstream}$

EQUATION 1

As an additional quality assurance measure, each transect was measured twice, consecutively. If the final discharge of the two measurements differed by more than 5 percent, a third measurement was conducted. Results were averaged, and computations were performed using the mean values of each transect. Data were qualified subjectively, based on the hydrographers observations of field conditions, and were incorporated in the reporting of final values.

2.2 DAN KLEINSMITH, FCA, SEEPAGE STUDY ALONG THE EASTSIDE CANAL (AUGUST-SEPTEMBER, 2015)

Dan Kleinsmith, FCA Staff, conducted a seepage study along the Eastside Canal in 2015. Potential water losses were determined using the inflow outflow method, as conducted by LaMarch (2004 and 2005). Direct measurements of discharge were obtained at preselected transects along multiple sections of the canal. These transects were selected to define sections of the canal between known points of diversion, or 'take-outs.' Any gains and/or losses within each subsection defined by upstream and downstream transects were estimated using Equation 1, where discharges associated with inflows and takeouts were excluded since all transects measured were between these locations.

The location of these transects eliminated any additional point losses between measurement sections, although flow rates of diversions between study sub-sections were not quantified. It is unclear whether uncertainties were assigned to each individual measurement, limiting the ability to provide potential error analysis surrounding the computed results.

2.3 MARK WHARRY, KPFF CONSULTING ENGINEERS, SYSTEM IMPROVEMENT PLAN (2016)

Mark Wharry, KPFF Engineer, estimated the potential water loss in the District using theoretical methods as part of his System Improvement Plan completed in 2016. Infiltration (seepage), evaporation/evapotranspiration rates, and excess end spills (overflows) were each calculated independently, and combined to compute theoretical total losses based on these three factors. The following methods were used to determine each loss factor.

2.3.1 SEEPAGE

Wharry (2016) estimated a theoretical infiltration loss based on National Resource Conservation Service permeability rates for soil types found within the District. Of the four soil types identified, infiltration rates ranged from 0.2 to 0.6 inches per hour. Based on an interpretive analysis, Wharry (2016) selected a rate of 0.3 inches per hour for estimated seepage computations and applied to the computed square feet of the Main, Dukes Valley, and East Side canals. Wharry (2016) estimated the computed area of each canal by multiplying the canal lengths, with the nominal canal infiltration width (wetted perimeter). The theoretical computed infiltration rates are presented in Section 3.

2.3.2 EVAPORTATION/EVAPOTRANSPIRATION

Wharry (2016) estimated potential canal evaporation rates using data obtained from a U.S. Bureau of Reclamation AgriMet station in Hood River. These rates are expressed as monthly means (data 1987-2010), and rates for the roughly seven-month irrigation season were averaged to obtain a general rate to apply for the season. The evaporation rate was applied to the computed surface area (in square feet) of the Main, Dukes Valley, and Eastside canals. The water surface area of each canal was estimated by multiplying the canal lengths, with an assumed average width. These calculations did not consider the wide range in canal widths throughout the District. The theoretical estimated infiltration rates are presented in Section 3.

2.3.3 OVERFLOWS

Wharry (2016) estimated approximately 60 overflows were within the district, where excess end spills are diverted back to natural river channels. These end spills are considered losses, since they represent water that has been diverted from the river in excess, and were not used for irrigation purposes. Wharry (2016) estimated losses associated with 13 of the most significant overflow locations assuming an average flow from each overflow. Wharry (2016) did not provide the methodology associated with quantifying these reported end spill discharges. Wharry (2016) estimated the remainder of the minor overflow points assuming they were 25 percent of the major overflow points, based on District input. These theoretical computed end spill volumes are presented in Section 3.

2.4 DAN KLEINSMITH, FCA, END SPILL DATA COLLECTION AND ANALYSIS (2016) AND (2017)

During the 2016 and 2017 irrigation seasons, FCA collaborated with EFID to determine the amount of water lost due to end spills in six specific locations (2016) and three locations (2017). FCA installed Onset Computer Corporation HOBO U20 water level loggers in these end spill boxes in June 2016, and May 2017. A laser level was used to record an initial water surface elevation in the box. The water surface elevation was referenced to the height of water above the weir. A HOBO logger was also placed at the district office to use as a barometric control (2016) and at individual pressure transducer locations (2017). FCA selected the following six locations in 2016 because they are considered major overflows in the EFID system:

- Marsh/Chamberlin Drive Overflow Box
- Dethman DeGroot Overflow Box
- Central Distribution (Neal Creek) Overflow Box
- Whiskey Creek Overflow Box
- Eastside Overflow Box (Lage)
- Chamberlin Overflow Box

FCA continued to monitor the Dethman DeGroot and Chamberlin overflows in 2017, but decided to include the Stricker Overflow as well. Figure 2.1 presents the locations of these seven overflows.

FIGURE 2.1. EAST FORK IRRIGATION DISTRICT OVERFLOW LOCATIONS MEASURED BY FARMERS CONSERVATION ALLIANCE IN 2016 AND 2017

FCA launched the loggers in 2016 to record a water level reading every 15 minutes. The HOBO units were left in place from mid-June to November, with one exception. FCA moved the logger installed at the Chamberlin Drive box to the Whiskey Creek box on July 7th, 2016. At the end of the irrigation season, all the loggers were retrieved from the field. FCA downloaded and processed the data from the loggers using Onset software. This software uses the barometric control data and measured pressures to calculate the depth of the logger in the water column in each respective end spill. The initial water surface elevation measured at the time of logger installation was used as a reference to determine the height of the water over the weir at each reading.

FCA installed HOBO submersible pressure transducers on May 12 and 13, 2017 in the three end spill boxes described previously for the 2017 irrigation season, and set them to log in 15-minute intervals. FCA paired each transducer with a barometric reference sensor on site. FCA retrieved the equipment on October 13, processed the data from the barometers and transducers, and estimated the discharge values for the period of analysis. FCA obtained weir equations from the US Bureau of Reclamation Water Measurement Manual for standard contracted rectangular weirs, and flows were calculated using the following Equation 2 unless noted otherwise in the following subsections:

$$Q_{weir} = 3.33H^{\frac{3}{2}}(L - 0.2H)$$

Q_{weir} = Discharge over a contracted rectangular weir

H = Height of water surface elevation above the weir

L = Length of weir

EQUATION 2

The results were analyzed and summarized as maximum instantaneous flow rates and mean flow rates, and total volume of loss in acre-feet over the deployment period. These data were compared with discharges measured during the same period at the OWRD streamflow gauge 1441400 in the East Fork Irrigation District Canal near Mt. Hood, OR. The OWRD streamflow gauge 1441400 is downstream of both the District's diversion, and one of the diversions for Mount Hood Irrigation District. The following subsections summarize assumptions used to process the HOBO data associated with the three overflow locations.

2.4.1 CHAMBERLIN OVERFLOW BOX

FCA deployed the HOBO on May 12, so the data was updated manually to reflect dates accurately. FCA was unsure of the exact actual time of the first scan, so the times of the 15-minute data intervals were left unadjusted. FCA adjusted the raw stage (sensor depth) data, based on instantaneous depth over the weir plate during initial deployment of the submersible pressure transducer. FCA estimated the discharge using the sharp-crested weir equation. However, after discussions with FCA staff who deployed sensors and viewing photos of the site, using this equation most likely resulted in significant decreased accuracy. The 'weir plate' is a 2-inch by 4-inch board placed across the box, with likely algal growth from nutrient rich return flows during the summer months. FCA would qualify these discharge values and expect them to vary at least 10 percent from actual discharge measurements.

In the data summary, these end flow losses are presented as acre-feet per month, and total losses for the season. Note that both May and October were partial months. The equipment was initially deployed on May 12, and was removed from the field on October 13.

2.4.2 DETHMAN OVERFLOW BOX

FCA deployed the HOBO on May 13, so the data was updated manually to reflect dates accurately. FCA was unsure of the exact actual time of the first scan, so the times of the 15-minute data intervals were left unadjusted. FCA adjusted the raw stage (sensor depth) data, based on instantaneous depth over the weir plate during initial deployment of the submersible pressure transducer. FCA estimated the discharge using the sharp-crested weir equation. However, after discussions with FCA staff who deployed sensors and viewing photos of the site, using this equation most likely resulted in significant decreased accuracy. The 'weir' is steel angle iron placed across the outflow point of the box, with likely algal growth from nutrient rich return flows during the summer months. The HOBO did not collect data during August 11 through 17 due to vandalism of the spill box. On August 17, FCA staff reset the pressure transducer, eliminating any further loss of data. FCA would qualify these discharge values and expect them to vary at least 8 percent from actual discharge measurements.

2.4.3 STRICKER OVERFLOW BOX

FCA deployed the HOBO on May 13, so the data was updated manually to reflect dates accurately. FCA was unsure of the exact actual time of the first scan, so the times of the 15-minute data intervals were left unadjusted. FCA adjusted the raw stage (sensor depth) data, based on instantaneous depth over the weir plate during initial deployment of the submersible pressure transducer. Some adjusted values were negative, indicating the water surface in the box fell below the elevation of the screen/trash rack and were changed to zero discharge values.

The configuration of this box was not conducive to discharge computations using weir equations. Flows entering the box traveled over a screened area, and discharged through a trash rack into a closed pipe. As such, discharge was computed using the Continuity Equation (i.e., discharge is equal to the product of mean velocity and water cross-sectional area). From the field notes, indicating a width of 2.5 feet, water depth of 0.10 feet, and a reported discharge of 0.44 cfs, FCA back computed the instantaneous velocity at 1.76 feet per second. This velocity was applied to the entire period of record during the irrigation season. The grate, or trash rack, across the exit from the box most likely collected debris and accumulated algae throughout the season. This would result in artificially higher stages, with no adjustment made to reflect actual discharge measurements. Based on the uncertainties related to average velocity applied to the period, and increased stages from debris and algae accumulating on the get away from the box, FCA would qualify these discharge values and expect them to vary by as much as 10 percent from actual discharge measurements.

2.5 GMA HYDROLOGY INC. SEEPAGE STUDY (OCTOBER 2017)

GMA Hydrology, Inc (GMA) was contracted by FCA to measure potential seepage on three sub-sections of the Eastside and Main canals, selected by FCA staff to be included in the study. Potential water losses due to a combination of seepage, evaporation and evapotranspiration were determined using the 'inflow-outflow method.' Direct measurements of discharge were obtained at the preselected transects along the canal, and any gains and/or losses were computed in the same manner as conducted by LaMarche (2004 and 2005). Figure 2.2 shows the locations of the three sub reaches selected for the study.

Additional quality assurance measures were performed in the same manner as LaMarche (2004 and 2005). The results were averaged, and computations were performed using the mean values of each transect. The data were qualified using the Statistical Uncertainty Calculation (also known as Interpolated Variance Estimation (IVE) or Interpolated Difference Technique). This method is discussed further in the GMA report. The sum of the three sub-reaches included in the study was 2.04 miles, which is a small fraction of the total length of the open canals in the District.

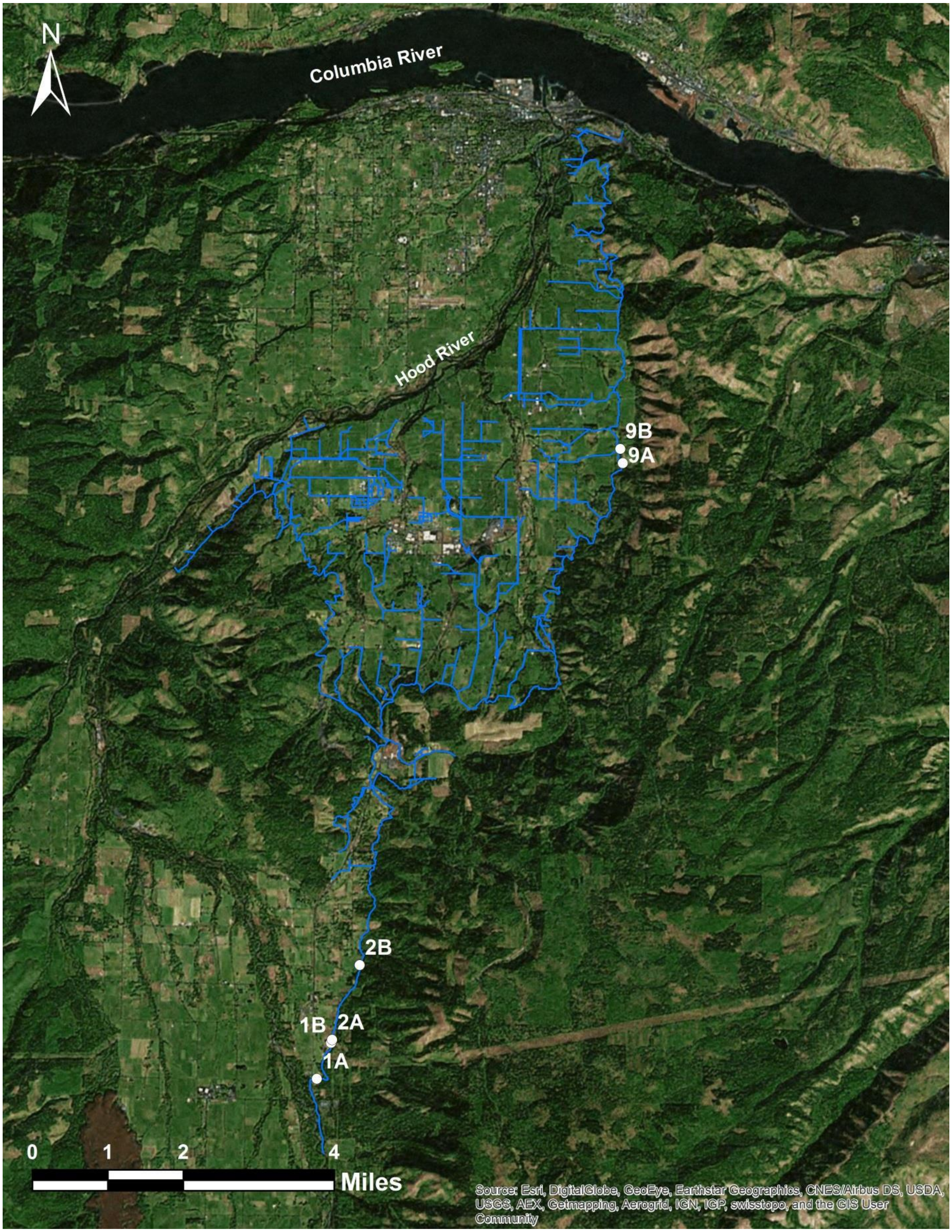

FIGURE 2.2 SUB REACHES INCLUDED IN THE SEEPAGE CONDUCTED BY GMA HYDROLOGY INC IN 2017 (GMA 2017).

Section 3
Results and Conclusions

3.1 OWRD CENTRAL LATERAL CANAL SEEPAGE STUDY (2004) AND NEAL CREEK CUTOFF SEEPAGE STUDY (2005)

The results from the measurements on the Eastside Canal indicated that roughly 1 cfs bypassed the Eastside Canal back into Neal Creek via fish screens on the Eastside Canal. Measurements taken on the East Canal downstream of the fish screens and at Swyers road indicate that possibly a 0.3 cfs of seepage occurs in this reach. However, the difference (1.4 percent of the flow) is within measurement error and, given the high clay content of soils in the area, thought to be a result of measurement uncertainty. Since this study was completed, the bypass to Neal Creek has been removed as part of the Central Lateral Piping project that was completed in 2008.

There is some uncertainty associated with this loss estimate. The typical accuracy of a discharge measurement following OWRD standards is five percent. This represents 1.5 cfs of uncertainty when measuring flows of 30 cfs (the flow measured at the beginning of the seepage run). Thus, the calculated seepage loss is very close to the measurement uncertainty. When considering the additional uncertainty associated with the accuracy of the diversion rates during the seepage measurements, the measured losses are within accepted uncertainty levels of the mass balance analysis.

LeMarche (2004 and 2005) also indicated that while nearly within the uncertainty levels, losses were consistent and did not fluctuate from gains to losses, each reach indicated losses of some kind. The study reaches were such a small percent of the overall ditch lengths within the entire EFID system, FCA does not recommend extrapolating these losses over the entire district.

3.2 DAN KLEINSMITH, FCA, SEEPAGE STUDY ALONG THE EASTSIDE CANAL (AUGUST-SEPTEMBER, 2015)

FCA did not qualify the measurements taken along the Eastside Canal with respect to uncertainty in the field, so each discharge measurement was assigned a fair rating (within plus or minus 8 percent of true discharge). However, results from the analysis were not conclusive, with gains and losses computed throughout the study reach in a seemingly random distribution. No clear trends were illustrated, as is evident in Figure 3.1 below and the regression analysis presented, which indicates almost zero correlation.

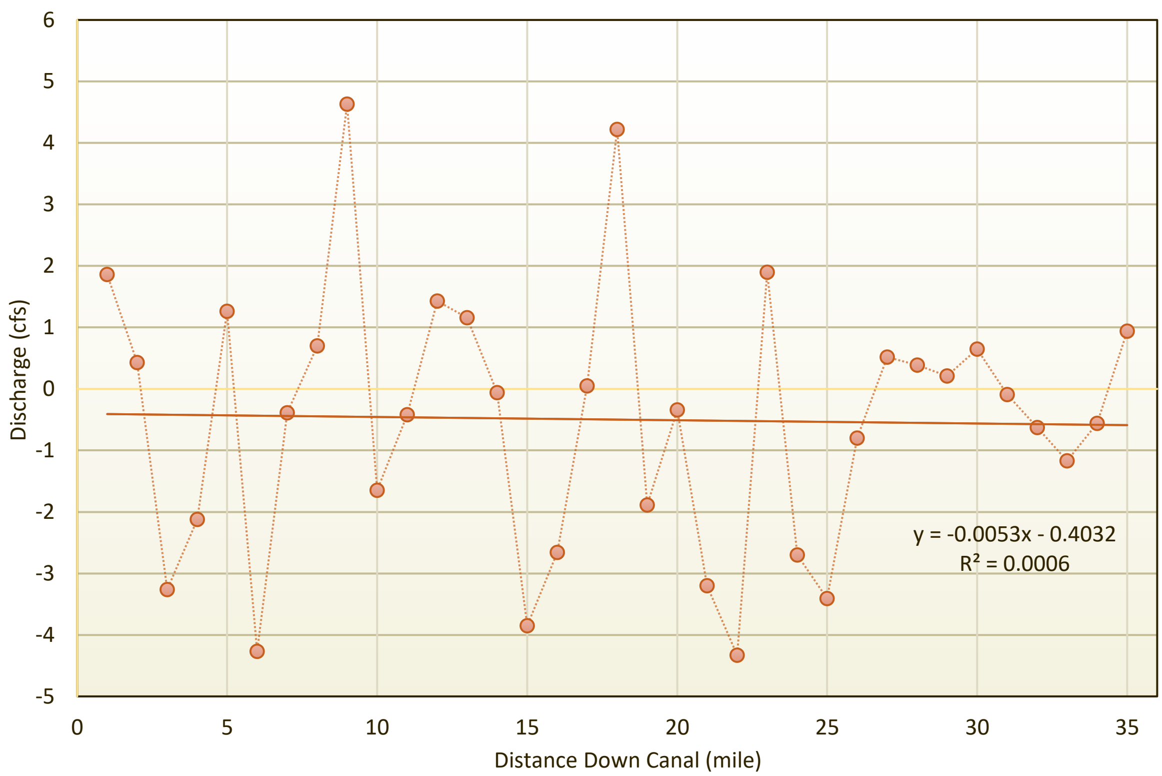

FIGURE 3.1. GAINS AND LOSSES MEASURED ALONG THE EASTSIDE CANAL IN EAST FORK IRRIGATION DISTRICT IN 2016.

3.3 MARK WHARRY, KPFF CONSULTING ENGINEERS, SYSTEM IMPROVEMENT PLAN (2016)

Wharry (2016) estimated water losses solely from theoretical methods, and did not calibrate them to any direct field measurements within the District. When comparing results from the other two Eastside canal studies (Kleinsmith 2015), (GMA, 2017) many of the report's assumptions come into question. The tables below illustrate the theoretical losses associated with potential seepage, evaporation/evapotranspiration, and end spill overflows.

TABLE 3-1. THEORETICAL SEEPAGE LOSSES IN EAST FORK IRRIGATION DISTRICT (WHARRY 2016).

Canal Name	*Canal (sq-ft)*	*Infiltration Rate (ft/s)*	*Total Infiltration Flows*
Main	530,534	0.0000069	3.66 cfs
Dukes Valley	239,500	0.0000069	1.65 cfs
Eastside	436,128	0.0000069	3.01cfs
Totals	1,206,162	0.0000069	8.32 cfs

TABLE 3-2. THEORECTICAL EVAPORATION IN EAST FORK IRRIGATION DISTRICT (WHARRY 2016).

Canal Name	Canal (sq-ft)	Evaporation Rate (ft/s)	Total Evaporation Flows
Main	331,584	0.00000018	0.06 cfs
Dukes Valley	139,708	0.00000018	0.03 cfs
Eastside	249,216	0.00000018	0.04 cfs
Totals	1,037,626	0.00000018	0.13 cfs

TABLE 3-3. THEORETICAL OVERFLOWS IN EAST FORK IRRIGATION DISTRICT (WHARRY 2016).

End Spill Box No.	Overflow Site	Weir (4/27/15)	Flow, cfs (04/27/15)
1	MHID West Box	n/a	0.50
2	MHID East Box	n/a	0.50
5A	Neal Creek-Internal	3”	1.91
5B	Neal Creek-External	3”	3.67
12	Kennedy Box	1 ½”	0.42
13	Wilson Box	2”	0.29
19	Dethman Ridge	1 ½”	1.52
29	Marsh-Chamberlin	3”	0.98
34	Chamberlin Line	3 ½”	0.80
42	Highline Ditch	1”	0.35
46	Loop Line – Lage	2”	1.75
52	Thomsen Line	1 ½”	0.45
53	Whiskey Creek	1 ½”	3.38
		Total (cfs)	16.52

Using these three theoretical system losses (including extrapolation of end spills to the 'minor' overflow points), Wharry (2016) provided an overall summary of system losses, presented as potential water conservation (in cfs) that would result from plan improvements as shown in Table 3-4.

TABLE 3-4. OVERALL WATER LOSSES SUMMARY IN EAST FORK IRRIGATION DISTRICT

Service Area	*Calculated Infiltration (cfs)*	*Calculated Evaporation (cfs)*	*Significant Overflows (cfs)*	*Minor Overflows (cfs)*	*Subtotals*
Main	3.66	0.06	6.33	1.58	11.63
Dukes Valley	1.65	0.03	2.13	0.53	4.34
Central	0.00	0.00	2.23	0.56	2.79
Eastside	3.01	0.04	5.58	1.40	10.03
Subtotals	8.32	0.13	16.27	4.07	28.79

While Wharry (2016) used valid assumptions in the theoretical estimation of total system water loss, when compared to empirical data collected in other studies there appears to be no correlation. With limited temporal data within the district to compare with the continuous record generated at Gauge 1441400, FCA could not conduct an adequate comparison.

3.4 DAN KLEINSMITH, FCA, END SPILL DATA COLLECTION AND ANALYSIS (2016) AND (2017)

The results in Tables 3-5 and 3-6 below indicate the maximum flow rate recorded, the average flow rate throughout the study period and total losses expressed as acre-feet. Figures and 8 and 9 below illustrate end spills versus inflows, compared with 15-minute data from Gauge 14114000.

TABLE 3-5. SUMMARY OF OVERFLOWS MEASURED IN 2016 IN EAST FORK IRRIGATION DISTRICT.

Overflow Box	*Volumetric Overflows (acre-feet), 2016*					*Average Overflow (cfs)*
	June	July	August	September	October	
Marsh-Chamberlin	56	248	149	67	0.05	1.93
Dethman	52	257	259	201	45.3	3.02
Central Distribution	148	408	371	292	53.6	4.72
Whiskey Creek	N/A	178	221	269	139	2.99
Eastside	36	88.3	113	96.6	70.2	1.50
Chamberlin Drive	N/A	N/A	N/A	N/A	N/A	1.10

Notes:

N/A: Not Applicable; measurements were only taken over a three-week period, or no data was available.

Whiskey Creek overflow spills were analyzed from early July through October 2016. There was a failure with the equipment in September. The wire holding the logger in place failed and the sensor dropped to the bottom of the overflow box. A theoretical gage height correction was applied in response to the sudden increase in stage, when the sensor fell to the bottom of the box. These reported values include the corrected data, with the qualifier that there is likely decreased accuracy.

Eastside overflow spills were analyzed from late June through October. There was a failure with the equipment in September. The wire holding the logger in place failed and the sensor dropped to the bottom of the overflow box. A theoretical gage height correction was applied in response to the sudden increase in stage, when the sensor fell to the bottom of the box. These reported values include the corrected data, with the qualifier that there is likely decreased accuracy.

The logger was moved from the Chamberlin Drive overflow box on July 7, 2016 to the Whiskey Creek end spill. This period is less than three weeks over the course of a five-month irrigation season.

TABLE 3-6. SUMMARY OF OVERFLOWS MEASURED IN 2017 IN EAST FORK IRRIGATION DISTRICT.

Overflow Box	*Volumetric Overflows (acre-feet), 2017*						*Average Overflow (cfs)*
Month	May[1]	June	July	August	September	October[1]	
Chamberlin Drive	48.9	69.0	75.2	92.7	63.8	8.92	1.17
Dethman	88.6	224	127	128	162	1.76	2.40
Stricker	16.3	9.91	16.3	23.2	24.9	16.6	0.35

Notes:

1. Both May and October were partial months of data (approximately two weeks), and do not represent total losses for the entire months.

Figures 3.2 and 3.3 below illustrate the measured discharge from end spills as compared to Gauge 14114000. When comparing inflow data, with excess end spill data for both the 2016 and 2017 irrigation seasons, there appears to be no correlation. Increased diversions do not correspond with increases in excess end spills. FCA assumes increased diversions result in increased on-farm use and overflows did not necessarily increase.

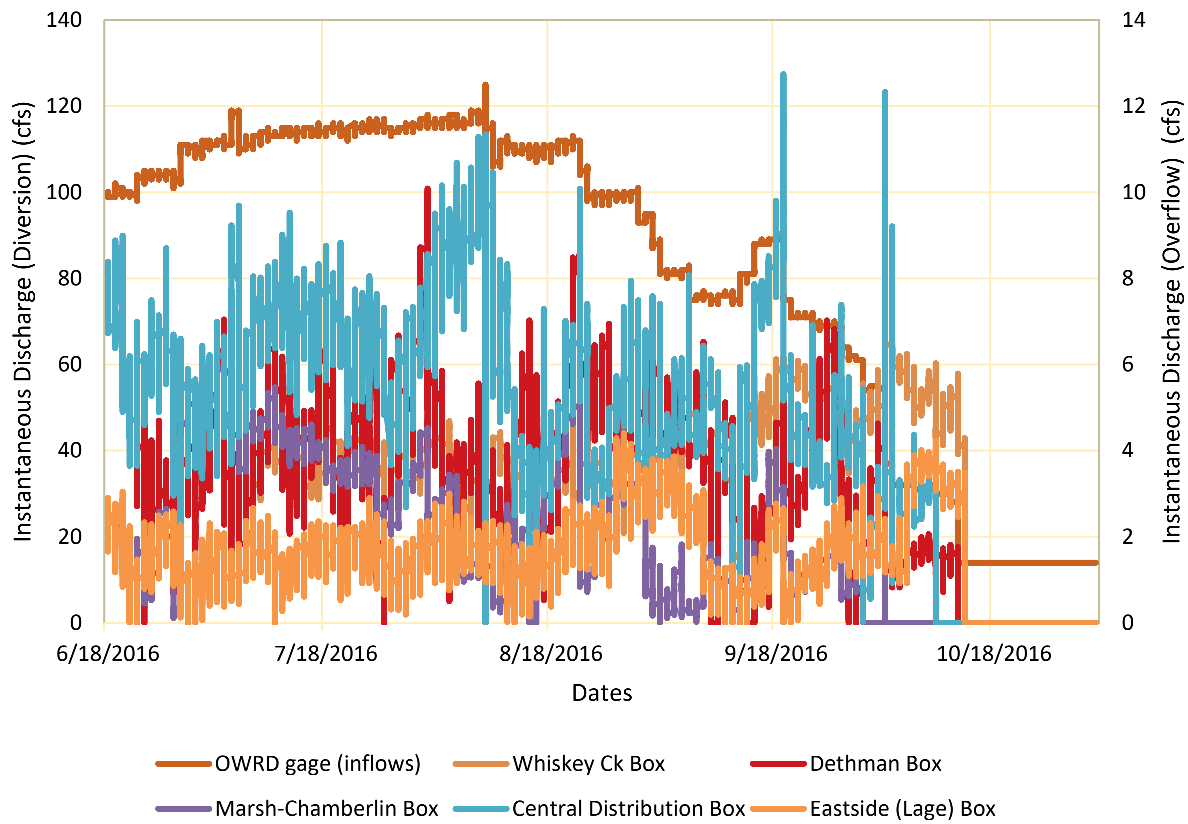

FIGURE 3.2. INSTANEOUS DISCHARGE ASSOCIATED WITH THE EAST FORK IRRIGATION DISTRICT MAIN CANAL AND OVERFLOWS IN 2016.

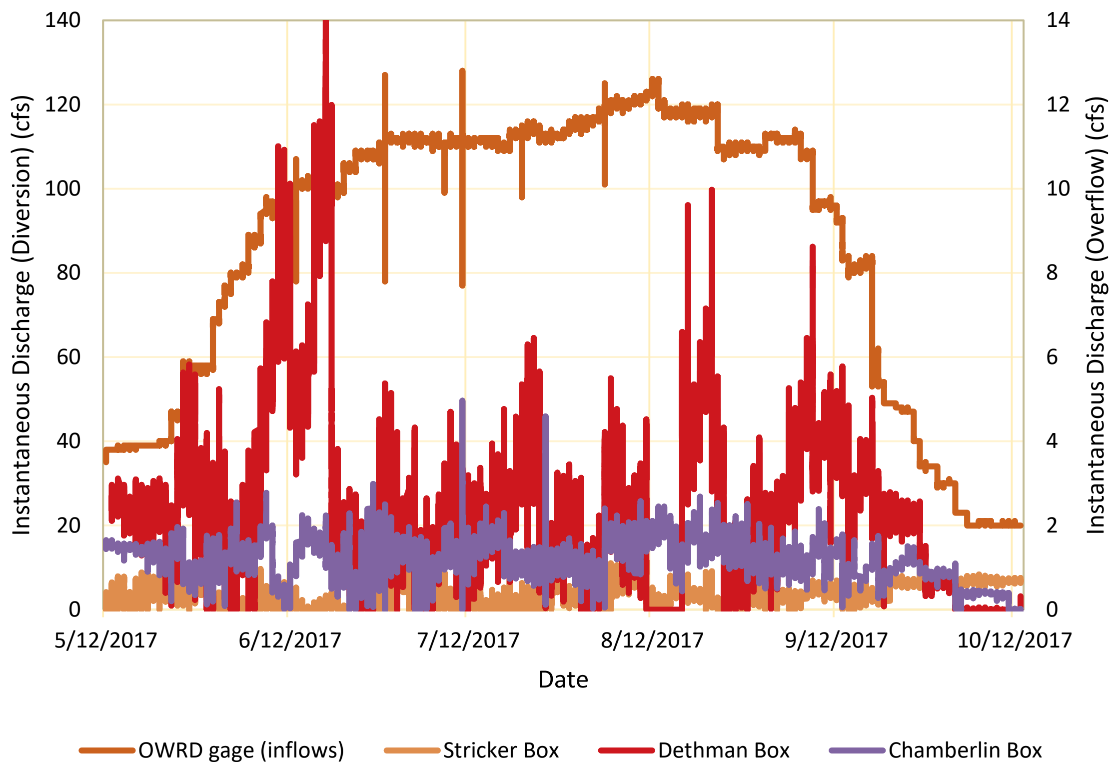

FIGURE 3.3. INSTANEOUS DISCHARGE ASSOCIATED WITH THE EAST FORK IRRIGATION DISTRICT MAIN CANAL AND OVERFLOWS IN 2017.

3.5 GMA HYDROLOGY INC. SEEPAGE STUDY (OCTOBER 2017)

In following quality control procedures discussed in section 2.5, results from the study indicated negligible losses in the three sub-reaches. None of the reaches indicated losses greater than the potential uncertainty inherent in mid-section discharge measurements. These results are considered valid, although extrapolating the findings throughout the entire EFID system does not appear feasible, given the limited reaches covered in the study versus the size of the entire system.

TABLE 3-7. WATER LOSS MEASUREMENTS TAKEN IN 2017 ON THE MAIN CANAL AND EASTSIDE CANAL IN EAST FORK IRRIGATION DISTRICT (GMA 2017).

Canal Name	Reach ID	Start ID	Stop ID	Reach Length (ft)	Measured Loss (cfs)	Reach Uncertainty (cfs)
Main	1	1A	1B	3,678	1.1	1.6
Main	2	2A	2B	5,922	1.0	1.7
Eastside	9	9A	9B	1,187	0.1	0.5

REFERENCES

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Kliensmith, D. (2017) Endspill Data Collection and Analysis in 2016 and 2017.

LaMarche, J (2004). Central Lateral Canal Seepage Study. Oregon Water Resources Department.

LaMarch, J. (2005). Neal Creek Cutoff Seepage Study. Oregon Water Resources Department.

Wharry, M. (2016). East Fork Irrigation District System Improvement Plan. Final Report. January 2016. KPFF Project #314222.

Appendix D
EPANET Hydraulic Model

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* E P A N E T *
* Hydraulic and Water Quality *
* Analysis for Pipe Networks *
* Version 2.0 * **

Input File: EFID_Alt.A_2018.04.24_Dual_Pipeline_merge_final.net

Link - Node Table: --
Link Start End Length Diameter
ID Node Node ft in --
Central_Lateral_Pipeline_000C01000 C01100_1 14.77 72
Central_Lateral_Pipeline_001aC01100_1 NODE_203 1307.82 72
Central_Lateral_Pipeline_002C01300 C01400 703.36 72 Central_Lateral_Pipeline_003C01400 C01500 91.48 72 Central_Lateral_Pipeline_004C01500 C01600 154.18 72
Central_Lateral_Pipeline_005C01600 C01700 24.22 72 Central_Lateral_Pipeline_006C01700 C01800 515.47 72 Central_Lateral_Pipeline_007C01800 C01900 329.85 72
Central_Lateral_Pipeline_008C01900 C02000 908.89 72 Central_Lateral_Pipeline_009C02000 C02100 254.25 72 Central_Lateral_Pipeline_010C04900 C05000 1394.16 48
Central_Lateral_Pipeline_011C05000 C05100 342.79 48 Central_Lateral_Pipeline_012C05100 C05200 323.29 30 Central_Lateral_Pipeline_015C02200 C02300 269.49 60
Central_Lateral_Pipeline_016C02400 C02500 614.54 60 Central_Lateral_Pipeline_017C02500 C02600 568.32 60 Central_Lateral_Pipeline_018C02300 C02400 754.1 60
Central_Lateral_Pipeline_019C02700 C02800 270.02 60 Central_Lateral_Pipeline_020C02600 C02700 425.61 60 Central_Lateral_Pipeline_021C03200 C03300 299.23 60
Central_Lateral_Pipeline_022C03100 C03200 286.59 60 Central_Lateral_Pipeline_023C02900 C03000 6.3 60 Central_Lateral_Pipeline_024C03000 C03100 5.9 60
Central_Lateral_Pipeline_025C02800 C02900 346.7 60 Central_Lateral_Pipeline_026NODE_023 EFID_069 2839.05 30 Central_Lateral_Pipeline_027EFID_085 EFID_084 1.72 30
Central_Lateral_Pipeline_028EFID_084 EFID_079 6.69 30
Central_Lateral_Pipeline_029aEFID_080 SR_WB_US 1350.5 30
Central_Lateral_Pipeline_029bSR_WB_DS EFID_077 0.33 30
Central_Lateral_Pipeline_030EFID_079 EFID_080 7.64 30
Central_Lateral_Pipeline_031aEFID_077 EA_WB_US 2987.26 30
Central_Lateral_Pipeline_031bEA_WB_DS EFID_400 0.12 30 Christopher_Pipeline_000bM04300 M04500 2.92 24 Christopher_Pipeline_001M04500 M04600 2.11 24
Christopher_Pipeline_002AM04600 NODE_200 820.84 24 Christopher_Pipeline_002BNODE_200 CP_WB_US_2 270.15 14.3 Christopher_Pipeline_002CCP_WB_DS_2 M04401 410.32 14.3

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
Christopher_Pipeline_003M04401 M04403 2369.51 14.3 Christopher_Pipeline_004M04403 NODE_002 1171.78 14.3 Christopher_Pipeline_005NODE_002 M04404 245.03 9.53
Christopher_Pipeline_006M04404 M04405 376.65 9.53 Christopher_Pipeline_007M04405 M04406 373.97 9.53 Christopher_Pipeline_008M04407 M04408 215.87 9.53
Christopher_Pipeline_009M04406 M04407 224.87 9.53 Christopher_Pipeline_010M04408 M04409 6.79 9.53 Christopher_Pipeline_011NODE_002 M04410 499.55 7.63
Christopher_Pipeline_012M04410 M04411 29.17 7.63 Christopher_Pipeline_013M04411 M04412 22.93 9.53 Christopher_Pipeline_014M04412 M04413 230.28 7.63
Christopher_Pipeline_015aM04413 NODE_202 555.3 7.63 Christopher_Pipeline_015bNODE_202 M04414 164.86 5.74 Christopher_Pipeline_016M04414 M04415 476.81 5.74
Christopher_Pipeline_017M04416 NODE_004 339.47 5.74 Christopher_Pipeline_018M04415 M04416 8.4 5.74 Christopher_Pipeline_019NODE_004 M04417 214.71 4.13
Christopher_Pipeline_020M04417 M04418 82.47 4.13 Christopher_Pipeline_021M04418 M04419 250.4 4.05 Christopher_Pipeline_022NODE_004 M04420 73.27 4.13
Christopher_Pipeline_024M04422 M04423 136.84 4.13 Christopher_Pipeline_025M04421 M04422 111.06 4.13 Christopher_Pipeline_026M04420 M04421 185.24 4.05 Highline_Canal_001DV04918 DV04919 717.06 6.19 Highline_Canal_002DV04917 DV04918 710.81 6.19
Highline_Canal_003DV04900 US_DV3 21.63 23.1 Highline_Canal_004DV04916 NODE_112 117.25 10.05 Highline_Canal_005DV04915 DV04916 161.2 10.05 Highline_Canal_006DV04914 DV04915 146.94 10.05 Highline_Canal_007DV04912_DV04913DV04914 374.29 10.05
Highline_Canal_008DV04911 DV04912_DV04913 386.85 10.05 Highline_Canal_009DV04910 DV04911 238.61 10.05 Highline_Canal_010DV04909 DV04910 623.93 10.05 Highline_Canal_011DV04908

DV04909 2634.07 10.05 Highline_Canal_012DV04907 DV04908 396.99 10.05 Highline_Canal_013DV04901 DV04902 1900.94 14.8 Highline_Canal_014DV03700 DV04901 635.99 14.8 Highline_Canal_015DV04902 DV04903 1055.41 14.8 Highline_Canal_016DV04906 DV04907 1290.36 11.92 Highline_Canal_017DV04905 DV04906 451.28 11.92 Highline_Canal_018DV04903 DV04904A_B 200.7 14.8 Highline_Canal_019aDV04904A_B DV05000_2 173.82 14.8 Highline_Canal_020DV05000_2 DV04905 1217.91 11.92 Ackerman_Hill_000DV04531 NODE_093 103.85 8.06 Ackerman_Hill_001DV04530 DV04531 170.69 8.06 Ackerman_Hill_002DV04527 DV04528 327.17 8.06

 Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in ---
Ackerman_Hill_003DV04528 DV04530 56.34 8.06 Ackerman_Hill_004DV04529 DV04527 84.55 8.06 Ackerman_Hill_005DV04507 DV04529 203.14 10.05 Ackerman_Hill_006DV04502 DV04501 848.26 11.92 Ackerman_Hill_007EFID_033 DV04505 622.54 10.05 Ackerman_Hill_008DV04503 DV04504 15.99 10.05 Ackerman_Hill_009DV04501 DV04503 469.33 11.92 Ackerman_Hill_010DV04504 EFID_033 681.65 10.05 Ackerman_Hill_011DV04506 DV04507 286.32 9.87
Ackerman_Hill_013DV04505 DV04506 1376.61 9.87 Ackerman_Hill_014DV04100 US_ACH 1408.96 14.38 Ackerman_Hill_016DV04543 NODE_095 13.87 4.13 Ackerman_Hill_017DV04537 DV04543 242.52 4.13 Ackerman_Hill_018DV04532 DV04535 618.31 4.21 Ackerman_Hill_019DV04535 DV04536 210.65 4.21 Ackerman_Hill_020DV04536 DV04537 310.27 4.13 Ackerman_Hill_021NODE_093 DV04532 5.01 8.06 Ackerman_Hill_022NODE_096 DV04544A 286.47 4.05
Ackerman_Hill_023NODE_095 DV04538_DV04539 916.74 4.05
Ackerman_Hill_024DV04538_DV04539DV04540 100.01 4.05 Ackerman_Hill_025DV04529 DV04508 462.99 4.13 Ackerman_Hill_026DV04508 Hernandez_Line 17.54 4.13 Ackerman_Hill_027DV04516 DV04515 2.59 4.13 Ackerman_Hill_028DV04514 DV04516 130.73 4.13 Ackerman_Hill_029DV04513 DV04514 70.47 4.13 Ackerman_Hill_030DV04512 DV04513 12.02 4.13 Ackerman_Hill_031DV04511 DV04512 235.56 4.13 Ackerman_Hill_032DV04510 DV04511 95.33 4.13 Ackerman_Hill_033DV04509 DV04510 75.36 4.13 Ackerman_Hill_034EFID_106 DV04509 41.58 4.13
Ackerman_Hill_035Hernandez_Line EFID_106 177.05 4.13 Ackerman_Hill_036Hernandez_Line NODE_091 694.61 4.13 Ackerman_Hill_037NODE_091 NODE_092 44.18 4.13
Ackerman_Hill_038NODE_092 DV04518 328.99 4.13 Ackerman_Hill_039NODE_094 DV04520 16.92 4.13 Ackerman_Hill_040DV04525 DV04526 357.1 4.13 Ackerman_Hill_041DV04524 DV04525 174.52 4.13 Ackerman_Hill_042DV04520 DV04524 69.99 4.13 Ackerman_Hill_043NODE_094 DV04521 53.14 4.13 Ackerman_Hill_044DV04521 DV04522 57.54 4.13 Ackerman_Hill_045DV04522 DV04523 91.85 4.13 Ackerman_Hill_046DV04545 DV04547_DV04546 462.75 4.05 Ackerman_Hill_047DV04532 DV04533 484.13 8.06 Ackerman_Hill_048DV04533 DV04534 626.41 4.21
Ackerman_Hill_049Summit_Road_LineDV04502 20.12 11.92 Ackerman_Hill_050NODE_091 DV04519 21.05 4.13 Ackerman_Hill_051DV04519 NODE_094 294.19 4.13

Link - Node Table: (continued) --
Link Start End Length Diameter ID Node Node ft in --- Ackerman_Hill_052NODE_095 NODE_096 538.46 4.05
Ackerman_Hill_053NODE_096 DV04545 112.09 4.05
Ackerman_Hill_054DV04538_DV04539DV0454_DV04542 159.02 4.05 Ackerman_Hill_055DV04545 DV04544B 26.21 4.05 Allison_Line_000C04900 C04800 454.55 10.05 Allison_Line_001aC04800 AL_US 2459.56 9.41 Allison_Line_002C04901A C04901Ba 339.84 8.06 Allison_Line_003C04901Ba C04901Bb_C04901C 5.06 6.19 Arens_Lateral_Line_000M05900 M05900A 0.01 4.21
Arens_Lateral_Line_001M05900 M05900B 1334.39 6.19 Bailey/Luse/Schultz_000NODE_114 M03000 31.54 45.517 Bailey_Line_000NODE_008 C03708 683.45 4.05 Bartlett_Loop_000NODE_076 DV04302 1725.75 4.13 Bartlett_Loop_007NODE_137 NODE_075 6.8 4.21 Bartlett_Loop_008NODE_075 DV04301 12.26 4.21 Bartlett_Loop_009NODE_075 NODE_076 30.19 4.21
Bartlett_Loop_010NODE_076 NODE_089 5.21 4.21 Bartlett_Loop_011NODE_089 DV04303 29.64 4.21 Bietler_Line_000C01700 EFID_081 6.73 6.19 Bietler_Line_001EFID_081 US_BL2 565.53 5.96 Bietler_Line_002aC01701 BL_US 1151.72 6.19 Bietler_Line_003EFID_076 C01702 53.5 6.08 Bietler_Line_004C01702 C01703A 407.51 5.96 Bietler_Line_005C01703A C01703B 9.14 4.05 Bowcut_Pipeline_000M04210 NODE_113 557.32 6.19 Bowcut_Pipeline_001M04209 M04210 187.53 6.19 Bowcut_Pipeline_002M04207 M04208 363.25 6.19 Bowcut_Pipeline_003M04208 M04209 74.91 6.19 Bowcut_Pipeline_004M04206 M04207 412.59 6.19 Bowcut_Pipeline_005M04205 M04206 23.75 6.19 Bowcut_Pipeline_006M04204 M04205 13.3 6.19 Bowcut_Pipeline_007M04203 M04204 1429.69 6.19 Bowcut_Pipeline_008M04202 M04203 433.83 6.19 Bowcut_Pipeline_009M04200_2 M04201 283.11 6.19 Bowcut_Pipeline_010M04201 M04202 0.1 6.19 Bowcut_Pipeline_011M04202 M04200_1 0.04 4.21 Bowcut_Pipeline_012NODE_113 M04212 26.26 4.21 Bowcut_Pipeline_013M04212 M04211 1.79 4.21 Bowcut_Pipeline_014M04216 M04215 229.29 4.21 Bowcut_Pipeline_015M04214 M04216

0.93 4.13 Bowcut_Pipeline_016NODE_115 M04214 1552.59 6.08 Bowcut_Pipeline_017NODE_115 M04213 79.69 4.21 Bowcut_Pipeline_018NODE_113 NODE_115 744.85 6.19
Buckley_Line_000C02218A US_BL3 653.2 3.94 Buckley_Line_001C02218B C02218C 730.93 4.21
Cameron_Hill_000EFID_087 EFID_086 234.51 5.96 Cameron_Hill_001aDV01101 EFID_087 1310.61 6.08

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
Cameron_Hill_003DV01100_DV01000US_CH3 1359.65 7.75 Central_Lateral_Pipeline_013EFID_085 EFID_083 16.62 8.06 Central_Lateral_Pipeline_014EFID_083 US_CLP2 1372.5 6.96
Central_Lateral_Pipeline_032E01000C E01000D 913.62 4.13
Central_Lateral_Pipeline_033NODE_023 E01000C 841.56 4.13
Central_Lateral_Pipeline_044C02100 C02200 22.1 72 Central_Lateral_Pipeline_045C03300 EFID_099 710.91 48 Central_Lateral_Pipeline_046C04500 C04600 697.13 48
Central_Lateral_Pipeline_047EFID_099 C04200 52.73 48 Central_Lateral_Pipeline_048C04400 C04500 607.37 48 Central_Lateral_Pipeline_049C04300 C04400 284.03 48
Central_Lateral_Pipeline_050C04200 C04300 302.65 48 Central_Lateral_Pipeline_051C04600 C04700 298.79 48 Central_Lateral_Pipeline_052C04700 C04900 264.4 48
Central_Lateral_Pipeline_053C05200 US_CLP 15.32 30 Central_Lateral_Pipeline_054EFID_400 NODE_023 829.34 30 Chamberlin_Pressure_Line_000DV04612 EFID_023 523.29 9.87
Chamberlin_Pressure_Line_001NODE_060 DV04610 58.23 10.05
Chamberlin_Pressure_Line_002DV04611 DV04612 123.91 10.05
Chamberlin_Pressure_Line_003DV04610 DV04611 1314.96 10.05
Chamberlin_Pressure_Line_004EFID_019 DV04618 830.84 7.75
Chamberlin_Pressure_Line_005DV04618 DV04619 11.72 5.96
Chamberlin_Pressure_Line_006DV04619 EFID_014 575.84 5.96
Chamberlin_Pressure_Line_007EFID_014 DV04620 100.34 5.96
Chamberlin_Pressure_Line_008DV04620 DV04621 6.89 4.05 Chamberlin_Pressure_Line_009DV04621 NODE_064 26.73 4.05 Chamberlin_Pressure_Line_010NODE_055 NODE_056 10.22 4.21
Chamberlin_Pressure_Line_011NODE_056 DV04602 1269.98 4.21
Chamberlin_Pressure_Line_012EFID_024 DV04606 722.39 4.21
Chamberlin_Pressure_Line_013EFID_023 DV04614 619.51 7.92
Chamberlin_Pressure_Line_014DV04614 DV04615 23.67 7.92
Chamberlin_Pressure_Line_015DV04615 DV04616 50.01 7.92
Chamberlin_Pressure_Line_016EFID_018 EFID_019 400.12 7.75
Chamberlin_Pressure_Line_017DV04616 EFID_018 284.55 7.92
Chamberlin_Pressure_Line_018NODE_064 DV04621B 145.37 4.05
Chamberlin_Pressure_Line_019EFID_019 DV04617 674.49 4.05
Chamberlin_Pressure_Line_020NODE_060 NODE_059 669.65 6.19
Chamberlin_Pressure_Line_021NODE_055 DV04604 1300.49 14.96
Chamberlin_Pressure_Line_023DV04605 EFID_024 627.67 11.92
Chamberlin_Pressure_Line_024DV04604 DV04605 38.5 13.09
Chamberlin_Pressure_Line_025NODE_133 NODE_131 370.71 16.18
Chamberlin_Pressure_Line_026NODE_131 DV04601 80.72 16.18
Chamberlin_Pressure_Line_027DV04603 MCL_US_1 676.99 14.38
Chamberlin_Pressure_Line_028DV04601 DV04603 217.47 14.38
Chamberlin_Pressure_Line_029NODE_059 DV04609 18.25 4.21
Chamberlin_Pressure_Line_030NODE_059 DV04608 10.81 4.21
Chamberlin_Pressure_Line_031EFID_024 DV04607 318.81 11.92

Link - Node Table: (continued) -- Link Start End Length Diameter
ID Node Node ft in --
Chamberlin_Pressure_Line_032DV04607 NODE_060 307.64 11.92
Chamberlin_Pressure_Line_033DV04613 NODE_134 21.41 4.94
Chamberlin_Pressure_Line_034EFID_023 DV04613 11.57 6.08
Chamberlin_Pressure_Line_035NODE_064 DV04621A 129.48 4.05
Chamberlin_Pressure_Line_036NODE_051 NODE_052 229.55 22.04
Chamberlin_Pressure_Line_037NODE_058 NODE_057 111.94 23.38
Chamberlin_Road_Line_Overflow_000DV05006 DV05007 990.88 5.96
Chamberlin_Road_Line_Overflow_001DV05008 DV05009 1322.33 4.13
Chamberlin_Road_Line_Overflow_001bDV05009 DV05010 2090.65 4.13
Chamberlin_Road_Line_Overflow_002DV05007 US_CRLO 353.4 5.96 Cherry_Hill_Line_000DV02500

US_CHL3 449.7 3.94 Cherry_Hill_Line_001EFID_058 EFID_057 11.34 4.21 Cherry_Hill_Line_002aEFID_057 CHH_US 1044.56 4.05 Chipping_Line_000NODE_007 C02201 1820.2 4.21 Chipping_Line_002aC02200 EFID_075 1147.8 20.23 Chipping_Line_003EFID_075 CHL_US_2 1936.29 18.53 Chipping_Line_004NODE_007 C02202 595.54 18.7 Chipping_Line_005C02202 C02203 865.52 16.83 Chipping_Line_009C02210A_B C02211AB 1542.21 11.71 Chipping_Line_010aC02211AB CHL_US_1 339.35 9.66 Chipping_Line_010bCHL_DS_1 EFID_064 0.01 10.05 Chipping_Line_011C02209 C02210A_B 1366.27 12.86 Chipping_Line_012C02208 C02209 49.21 13.09 Chipping_Line_014NODE_129 C02208 1326.65 13.09 Chipping_Line_015EFID_064 C02215 1051.96 8.06 Chipping_Line_016C02215 C02216 819.91 6.19 Chipping_Line_017C02216 C02217 705.98 5.96 Chipping_Line_018C02217 C02218A 196.32 5.96 Chipping_Line_019EFID_064 C02212 1591.11 6.19 Chipping_Line_020C02212 EFID_059 10.53 6.19 Chipping_Line_021C02203 C02204 172.52 16.83 Chipping_Line_022C02204 C02205 118.42 16.83 Chipping_Line_023C02205 C02206 300.45 16.83 Chipping_Line_024NODE_129 C02207A_F 332.87 10.05 Chipping_Line_024bC02206 NODE_129 23.63 16.83 Crag_Rat_Line_000E04100 E04200 7.09 9.87 Crag_Rat_Line_001E04101 NODE_041 3.73 7.75 Crag_Rat_Line_002aE04200 CR_US_1 1520.38 7.75 Crag_Rat_Line_002bCR_DS_1 E04101 5.55 7.75 Crag_Rat_Line_003NODE_041 US_CR2 2092.18 5.35 Crag_Rat_Line_004NODE_041 EFID_022 1816.34 3.94 Crag_Rat_Line_006NODE_042 E04103A_2 1003.42 4.13 Crag_Rat_Line_007E04104 E04105 1247.58 6.19 Crag_Rat_Line_008E04105 E04105a 268.58 4.21 Crag_Rat_Line_009E04105a E04105b 3.32 4.21 Crag_Rat_Line_010NODE_042 E04103A_1 1172.14 4.05 Crag_Rat_Line_011E04103A_1 E04103B 651.01 4.05

Link - Node Table: (continued) --

Link Start End Length Diameter ID Node Node ft in --- Crag_Rat_Line_012E04104 E04104_a 2.82 4.21 Crag_Rat_Line_013E04104_a E04104_b 50.96 4.21 Dethman/Swyers_Line_000aE05500 DSL_US 2871.06 8.68 Dethman/Swyers_Line_003NODE_035 E05500_AB 322.44 6.19 Dethman/Swyers_Line_008NODE_035 E05500_CDE 341.85 6.19 Dethman/Swyers_Line_011E05500_CDE E05500_F 309.22 4.21 Dethman_Ridge_Line_000C03700 C03701A 328.69 28.04 Dethman_Ridge_Line_001aDRL_DS C03704_C03705 1216.49 26.97 Dethman_Ridge_Line_002C03701A NODE_132 8.52 28.04 Dethman_Ridge_Line_003C03704_C03705 C03702 0.45 26.97 Dethman_Ridge_Line_004C03702 C03706_2 1.52 26.97 Dethman_Ridge_Line_005C03706_2 C03706_1 176.28 26.97 Dethman_Ridge_Line_006C03706_1 C03707 1549.36 26.97 Dethman_Ridge_Line_007C03707 NODE_008 39.48 26.97 Dethman_Ridge_Line_008NODE_008 C03709 403.66 26.17 Dethman_Ridge_Line_009C03709 C03710 450.1 26.17 Dethman_Ridge_Line_010C03710 C03800 69.28 26.17 Dethman_Ridge_Line_011C03800 EFID_046 6.64 24.3 Dethman_Ridge_Line_012EFID_046 C03711 137.62 24.3 Dethman_Ridge_Line_013C03711 C04000 85.51 24.3 Dethman_Ridge_Line_014C04000 EFID_042 121.62 22.44 Dethman_Ridge_Line_015EFID_042 C03712 175.65 22.44 Dethman_Ridge_Line_016C03712 C03713 418.06 22.44 Dethman_Ridge_Line_017C03713 C03714 551.09 22.04 Dethman_Ridge_Line_018C03714 C03715 462.5 22.04 Dethman_Ridge_Line_019C03715 EFID_034 675.89 22.44 Dethman_Ridge_Line_020EFID_027 C03725 1323.9 13.09 Dethman_Ridge_Line_021C03725 C03726 343.35 13.09 Dethman_Ridge_Line_022C03726 C03727 264.84 13.09 Dethman_Ridge_Line_023C03727 C03728 69.26 11.92 Dethman_Ridge_Line_024C03728 C03729 1175.9 11.71 Dethman_Ridge_Line_025C03729 EFID_017 51.11 11.71 Dethman_Ridge_Line_027EFID_015 C03731 921.63 4.13 Dethman_Ridge_Line_028NODE_015 NODE_016 11.95 4.13 Dethman_Ridge_Line_029NODE_016 C03732 1374.92 4.13 Dethman_Ridge_Line_030EFID_026 US_DRL2 1658.89 5.89 Dethman_Ridge_Line_031C03737 C03738_C03739 309.08 4.21 Dethman_Ridge_Line_032C03738_C03739 C03740 97.68 4.21 Dethman_Ridge_Line_034EFID_034 NODE_130 1005.71 6.19 Dethman_Ridge_Line_035NODE_130 NODE_122 361.84 4.21 Dethman_Ridge_Line_036EFID_017 NODE_015 757.43 6.08 Dethman_Ridge_Line_037NODE_130 EFID_035 0.02 4.21 Dethman_Ridge_Line_038EFID_035 C03719 2.04 4.21 Dethman_Ridge_Line_039C03719 C03717_C03718 56.42 4.21 Dethman_Ridge_Line_042C03717_C03718 C03716 17.75 4.21 Dethman_Ridge_Line_043EFID_015 C03730 9.86 4.13 Dethman_Ridge_Line_044EFID_020 C03743 266.54 10.05

Link - Node Table: (continued) --

Link Start End Length Diameter ID Node Node ft in --- Dethman_Ridge_Line_045EFID_100 C03744 148.41 7.92 Dethman_Ridge_Line_046C03743 EFID_100 275.76 8.06 Dethman_Ridge_Line_047C03744 C03745 851.52 7.75 Dethman_Ridge_Line_048C03745 C03746 1143.3 5.96 Dethman_Ridge_Line_049EFID_034 C03723 968.48 22.44 Dethman_Ridge_Line_050C03723 C03724 320.2 22.44 Dethman_Ridge_Line_051C03724 EFID_027 6.68 22.44 Dethman_Ridge_Line_052EFID_026 C03741 642.84 14.7 Dethman_Ridge_Line_053C03741 C03742

131.58 13.09 Dethman_Ridge_Line_054EFID_027 EFID_026 3.81 14.96 Dethman_Ridge_Line_055EFID_017 EFID_016 69.73 9.87 Dethman_Ridge_Line_056EFID_016 C03733 716.7 9.66 Dethman_Ridge_Line_057C03735 C03736 16.07 7.75 Dethman_Ridge_Line_058C03733 C03734 6.67 9.66 Dethman_Ridge_Line_059C03734 C03735 9.13 7.75 Dethman_Ridge_Line_060NODE_015 EFID_015 35.04 6.08 Dethman_Ridge_Line_061C03742 US_DRL3 525.26 12.86 Dethman_Ridge_Line_062NODE_122 C03720_C03720a 4.9 4.21 Dethman_Ridge_Line_063NODE_122 C03722 4.78 4.21 Dethman_Ridge_Line_064NODE_122 C03721 0.69 4.21 Dukes_Valley_Canal_000NODE_135 DV01100_DV01000 858.18 29.91 Dukes_Valley_Canal_001DV01800A_D DV01900 1770.06 28.73 Dukes_Valley_Canal_002DV01900 DV02000 912.52 28.73 Dukes_Valley_Canal_003DV02000 DV02100 259.07 28.73 Dukes_Valley_Canal_004DV02100 DV02200 103.97 28.73 Dukes_Valley_Canal_005DV02200 DV02300 854.19 28.73 Dukes_Valley_Canal_006DV02400 DV02500 20.11 28.73 Dukes_Valley_Canal_007DV02500 DV02600 2851.73 28.73 Dukes_Valley_Canal_008DV02300 DV02400 2224.23 28.73 Dukes_Valley_Canal_009DV03200 DV03300 432.16 26.97 Dukes_Valley_Canal_010DV02600 DV02700 997.28 28.73 Dukes_Valley_Canal_011DV02700 DV02800 56.89 28.73 Dukes_Valley_Canal_012DV02800 DV02900 142.24 26.97 Dukes_Valley_Canal_013DV02900 DV03100 570.54 26.97 Dukes_Valley_Canal_014DV03100 DV03200 901.85 26.97 Dukes_Valley_Canal_015DV03300 DV03400 185.45 26.97 Dukes_Valley_Canal_016DV03400 DV03500 13.81 26.97 Dukes_Valley_Canal_017DV03500 DV03600 217.67 26.97 Dukes_Valley_Canal_018DV03600 DV04900 16 26.97 Dukes_Valley_Canal_019EFID_082 EFID_073 4014.42 30.57 Dukes_Valley_Canal_020EFID_073 DV01200 1324.43 30.57 Dukes_Valley_Canal_021DV01200 DV01300 149.32 30.57 Dukes_Valley_Canal_022DV01700 DV01800A_D 106.91 28.73 Dukes_Valley_Canal_023DV01300 DV01400 1591.66 28.73 Dukes_Valley_Canal_024DV01600 DV01700 911.89 28.73 Dukes_Valley_Canal_025DV01400 DV01500 80.01 28.73 Dukes_Valley_Canal_026DV01500 DV01600 425.26 28.73

Link - Node Table: (continued) --

Link Start End Length Diameter ID Node Node ft in --- Dukes_Valley_Pipeline_000aDV01100_DV01000DVP_US_1 2964.4 30.35 Dukes_Valley_Pipeline_000bDVP_DS_1 DV01102 0.21 29.91 Dukes_Valley_Pipeline_001DV01102 EFID_082 942.12 30.57 Dukes_Valley_Pipeline_002EFID_088 NODE_135 640.49 29.91 Dunphin/Castaneda_Line_000NODE_132 C03701B 1.56 6.19 Eastside_Auxillary_000EFID_400 E01200 25.2 6.19 Eastside_Auxillary_001E01200 E01201 3271.31 5.96 Eastside_Auxillary_002E01201 E01202 157.57 5.96 Eastside_Auxillary_003E01202 E01203 123.82 4.94 Eastside_Auxillary_003bE01203 E01204 30.05 4.13 Eastside_Auxillary_004E01204 E01205 29.62 4.13 Eastside_Auxillary_005E01205 E01206 10.37 4.13 Eastside_Auxillary_006E01206 E01207 339.37 4.13 Eastside_Auxillary_007E01207 E01208 186.63 4.13 Eastside_Auxillary_008E01208 E01209 10.9 4.13 Eastside_Canal_000EFID_069 EFID_094 551.45 39.83 Eastside_Canal_000_1EFID_094 E01900 66.17 39.83 Eastside_Canal_002E01900 E02100 944.55 39.83 Eastside_Canal_003E02000 E02200 422.44 39.83 Eastside_Canal_006E02100 E02000 396.18 39.83 Eastside_Canal_007E02200 E02300 2570.32 39.83 Eastside_Canal_008E02300 E02400 208.97 39.83 Eastside_Canal_009E02400 E02500 461.91 39.83 Eastside_Canal_010E02500 NODE_024 1251.53 38.576 Eastside_Canal_011NODE_024 E02700 1689.53 38.576 Eastside_Canal_012E02700 E02800 212.14 38.576 Eastside_Canal_013E02800 E02900 557.56 38.576 Eastside_Canal_014E02900 EFID_054 389.81 38.576 Eastside_Canal_015EFID_054 NODE_117 1560.01 38.576 Eastside_Canal_016NODE_034 E06000_2 0.02 21.58 Eastside_Canal_017E06000_2 E06100 394.87 21.58 Eastside_Canal_018E06100 E06200 130.45 17.98 Eastside_Canal_019E06200 E06300 451.67 18.37 Eastside_Canal_020E04900 E05000 396.5 25.72 Eastside_Canal_021E05000 E05100 576.61 25.72 Eastside_Canal_022E05100 E05200 1480.22 25.72 Eastside_Canal_023E05200 E05400 807.16 25.72 Eastside_Canal_025E05400 E05300 14 25.72 Eastside_Canal_026E03300 E03400 2086.76 38.576 Eastside_Canal_027E03400 E03500 1047.59 38.576 Eastside_Canal_028E03500 E03600 809.08 38.576 Eastside_Canal_029E03600 E03700 792.04 38.576 Eastside_Canal_030E03801 E03800_E03803 0.01 38.576 Eastside_Canal_031E03700 E03801 1688.3 38.576 Eastside_Canal_032E03800_E03803 E03900 294.02 38.576 Eastside_Canal_033E03900 E04000 486.71 38.576 Eastside_Canal_034E04000 E04100 1017.33 38.576

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Eastside_Canal_035E05500 E05600 784.04 23.38 Eastside_Canal_036E05600 E05700 652.08 21.58 Eastside_Canal_037E05700 E05800 73.43 21.58 Eastside_Canal_038E05800 E05900 1062.63 21.58

Eastside_Canal_039E05900 NODE_034 273.1 21.58 Eastside_Canal_041E06300 EFID_007 302.08 16.18 Eastside_Canal_042NODE_117 E03000B 54.38 38.576 Eastside_Canal_043EFID_095 E03200A 761.98 38.576 Eastside_Canal_044E03000B E03100 234.6 38.576 Eastside_Canal_045E03100 EFID_095 7.97 38.576 Eastside_Canal_046E03200C E03300 20.89 38.576 Eastside_Canal_047E03200B E03200C 282.92 38.576 Eastside_Canal_048E03200A E03200B 55.05 38.576 Eastside_Canal_049E04100 E04300_1 533.4 33.06 Eastside_Canal_050E04300_2 E04400 278.38 33.06 Eastside_Canal_051E04300_1 E04300_2 31.68 33.06 Eastside_Canal_052E04400 E04500 396.3 33.06 Eastside_Canal_053E04500 E04600 430.38 33.06 Eastside_Canal_054E04600 E04700 229.49 33.06 Eastside_Canal_055EFID_096 E04900 0.01 33.06 Eastside_Canal_056E04700 E04800 171.28 33.06 Eastside_Canal_057E04800 EFID_096 1305.01 33.06 Ehrentraut_000 NODE_117 E03000A 32.42 4.13 Fisher_Line_000NODE_022 US_FS 1691.05 4 Fisher_Line_001EFID_090 M02400_M02500 671.56 4.21 Fisher_Line_002EFID_089 EFID_090 1190.57 4.21 Gilkerson_Line_000C01400 C01401B 4.78 6.19 Gilkerson_Line_001C01403B C01403A 2.6 4.21 Gilkerson_Line_002C01403A US_GL3 1306.53 3.88 Gilkerson_Line_003C01401B C01401A 0.63 6.19 Gilkerson_Line_004aC01401A GL_US_1 2089.17 5.8 Gilkerson_Line_004bGL_DS_1 C01403B 0.76 6.19 Gilkerson_Line_005EFID_074 C01403C 750.46 4.05 Highline_Canal_000NODE_112 DV04917 280.18 4.21 Hukari_Line_000NODE_139 E06617 922.64 4.78 Hukari_Line_002NODE_031 E06617A 1284.19 4.05 Hukari_Line_003NODE_031 E06617B 702.72 4.13 Kellly_Line_000aNODE_034 KL_US 1529.8 4.34 Kellly_Line_001EFID_009 E06000_1 1476.13 4.13 Kennedy_Line_000EFID_059 C02213 471.81 6.08 Lariza_Line_000aEFID_098 US_LRL 1144.49 6.19 Lariza_Line_001E06609_B E06609_A 4.91 4.21 Lenz_Butte_Line_000C03800 EFID_047 9.44 10.05 Lenz_Butte_Line_001EFID_049 EFID_048 177.75 10.05 Lenz_Butte_Line_002EFID_048 C03801 58.58 10.05 Lenz_Butte_Line_003C03801 C03802 235.98 10.05 Lenz_Butte_Line_004EFID_047 EFID_049 164.77 10.05

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Lenz_Butte_Line_005C03802 C03900 428.12 10.05 Lenz_Butte_Line_006EFID_039 C03804 400.24 6.08 Lenz_Butte_Line_007NODE_011 NODE_012 6.13 4.21 Lenz_Butte_Line_008NODE_012 C03805 359.58 4.21 Lenz_Butte_Line_010C03900 EFID_043 12.18 6.19 Lenz_Butte_Line_011EFID_043 C03803 821.93 6.19 Lenz_Butte_Line_012C03803 EFID_039 131.55 6.19 Lenz_Butte_Line_013NODE_011 C03806 86.82 4.21 Lenz_Butte_Line_014EFID_039 NODE_011 19 4.21 Loop_Line_000 NODE_039 E04906 61.85 4.21 Loop_Line_001 NODE_040 E04909 321.52 4.13 Loop_Line_001a EFID_012 E04905 2791.46 16.83 Loop_Line_002 EFID_101 E04921 293.04 4.05 Loop_Line_003 EFID_101 E04920_C 37.11 4.05 Loop_Line_004 E04920_C E04920_A 630.73 4.05 Loop_Line_005 E04920_A E04920_B 44.66 4.05 Loop_Line_006 EFID_102 E04916 224.48 7.92 Loop_Line_007 E04916 EFID_103 13.88 4.13 Loop_Line_008 EFID_103 E04917 1800.79 4.05 Loop_Line_009 E04917 E04918 30.46 4.05 Loop_Line_010 E04919_AB EFID_101 1866.85 5.96 Loop_Line_011 EFID_011 EFID_010 1575.21 11.71 Loop_Line_012 EFID_010 E04912 52.16 11.71 Loop_Line_013 E04912 E04913 187.78 11.71 Loop_Line_014 E04913 E04914 289.46 9.87 Loop_Line_015 E04914 E04915 667 9.87 Loop_Line_016 E04915 EFID_102 306.23 9.87 Loop_Line_017 EFID_102 E04919_AB 411.29 6.4 Loop_Line_020 E04905 NODE_039 155.29 14.96 Loop_Line_021 E04900 E04901 520.61 21.58 Loop_Line_022 E04902 E04903B 281.06 21.58 Loop_Line_023 E04903B E04903A 74.95 17.98 Loop_Line_024a E04903A LL_US_1 764.51 16.15 Loop_Line_024b LL_DS_1 EFID_012 16.08 16.83 Loop_Line_025 E04901 E04902 1101.24 21.58 Loop_Line_026 NODE_040 E04910 655.25 10.05 Loop_Line_027 E04910 EFID_104 113.43 4.21 Loop_Line_028 EFID_104 E04911 68.98 4.21 Loop_Line_029 E04907_2 EFID_011 633.5 14.7 Loop_Line_030 EFID_011 NODE_040 449.11 9.87 Loop_Line_035 NODE_040 E04908_1 674.67 4.13 Loop_Line_036 EFID_012 E04904 439.9 4.21 Loop_Line_038 NODE_039 E04907_2 575.01 14.7 Lower_Highline_Pressure_001EFID_001 E06700 23.14 8.06 Lower_Highline_Pressure_003E06702B_1 NODE_026 1.72 6.19 Lower_Highline_Pressure_005E06700 E06621 78.98 8.06 Lower_Highline_Pressure_006E06705B E06705A 350.74 4.21

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Lower_Highline_Pressure_007E06705CD E06705B_2 299.26 4.21 Lower_Highline_Pressure_008E06705B_2 E06706 448.45 4.21 Lower_Highline_Pressure_009E06705A E06705CD 2.33 4.21 Lower_Highline_Pressure_014E06706 E06707A 398.02 4.21 Lower_Highline_Pressure_015E06707A NODE_027 4.21 4.21 Lower_Highline_Pressure_016NODE_027 E06707E 435.79 4.13 Lower_Highline_Pressure_017NODE_027 E06707AB 877.45 4.05

Lower_Highline_Pressure_018NODE_027 E06707D 19.7 4.21 Lower_Highline_Pressure_019E06707D E06707C 1042.55 4.05 Lower_Highline_Pressure_020aNODE_026 E06703A 523.59 6.08 Lower_Highline_Pressure_021E06703A NODE_025 1.28 6.08 Lower_Highline_Pressure_024NODE_026 E06702A 578.94 4.13 Lower_Highline_Pressure_025E06702A E06702A_2 413.6 4.05 Lower_Highline_Pressure_027NODE_025 E06704 32.53 5.96 Lower_Highline_Pressure_028aE06704 LHP_US_2 440.03 4.83 Main_Canal_000 Reservoir_1 EFID_091 2332.17 51.208 Main_Canal_001 EFID_091 M01100_2 1679.32 51.208 Main_Canal_002 M01100_2 MHID_POD 1361.33 51.208 Main_Canal_003 MHID_POD M01100_1 206.18 51.208 Main_Canal_004 M01100_1 MHID_POD_East 3988.15 51.208 Main_Canal_005 MHID_POD_East M01200 6382.93 51.208 Main_Canal_006 M01200 M01300 907.01 45.517 Main_Canal_007 M01300 M01400 368.74 45.517 Main_Canal_008 M01400 M01500 543.23 45.517 Main_Canal_009 M01500 M01600 1076.02 45.517 Main_Canal_010 M01600 M01700B 1148.74 45.517 Main_Canal_011 M02000B M02000A 41.08 45.517 Main_Canal_012 M02000A M02100 718.26 45.517 Main_Canal_013 M01700B M01700A 0.01 45.517 Main_Canal_014 M01700A M01800 620.21 45.517 Main_Canal_015 M01800 M01900 292.25 45.517 Main_Canal_016 M01900 M02000B 632.28 45.517 Main_Canal_017 M02100 M02200 240.39 45.517 Main_Canal_018 M02200 M02300A_C 348.72 45.517 Main_Canal_019 M02300A_C NODE_022 801.44 45.517 Main_Canal_021 M04300 M04700 584.99 45.517 Main_Canal_022 M05100 M05000 0.01 45.517 Main_Canal_023 M05000 M05200 208.71 45.517 Main_Canal_024 M04900 M05100 3.89 45.517 Main_Canal_025 M04700 M04800 104.2 45.517 Main_Canal_026 M04800 M04900 86.33 45.517 Main_Canal_027 M05200 M05300 459.38 45.517 Main_Canal_028 M05300 M05400 222.24 45.517 Main_Canal_029 M05400 M05500 11.3 45.517 Main_Canal_030 M05500 M05600 437.51 45.517 Main_Canal_031 M05600 M05700 633.83 45.517 Main_Canal_032 M05700 M05900 394.28 45.517

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Main_Canal_033 NODE_125 M06000 349.47 45.517 Main_Canal_034 M06000 M06100 125.71 45.517 Main_Canal_036 M06100 C01100_2 387.31 45.517 Main_Canal_037aM06200 MC_WB_US 37.66 66 Main_Canal_037bMC_WB_DS C01000 0.01 66 Dukes_Valley_Pipeline_002aC01000 EFID_088 0.02 29.91 Main_Canal_039 M04200_2 M04300 125.83 45.517 Main_Canal_041 NODE_114 M03100 82.83 45.517 Main_Canal_042 M03100 M03200 132.27 45.517 Main_Canal_043 M03200 M03300 368.93 45.517 Main_Canal_044 M03300 M03400 64.65 45.517 Main_Canal_045 M03400 M03500 420.64 45.517 Main_Canal_046 M04000 M04100 972.23 45.517 Main_Canal_047 M03500 M03600 403.24 45.517 Main_Canal_048 M03700 M03800 426.13 45.517 Main_Canal_049 M03600 M03700 1356.34 45.517 Main_Canal_050 M03800 M03900 120.9 45.517 Main_Canal_051 M03900 M04000 47.07 45.517 Main_Canal_052 EFID_093 M04200_2 130.33 45.517 Main_Canal_053 M04100 EFID_093 321.78 45.517 Main_Canal_054 NODE_022 M02600 1213.32 45.517 Main_Canal_055 M02600 M02700 228.74 45.517 Main_Canal_056 M02700 M02800 354.98 45.517 Main_Canal_057 M02800 M02900 294.3 45.517 Main_Canal_058 M02900 NODE_114 800.6 45.517
Main_Canal_Tavern_Chute_000M05900 M05800 11.34 45.517 Main_Canal_Tavern_Chute_001M05800 NODE_125 58.63 45.517 Marsh/Chamberlin_Line_000DV03900_2 DV03701 15.8 21.58 Marsh/ Chamberlin_Line_001DV03701 DV03702 289.05 21.58 Marsh/Chamberlin_Line_002aDV03700 NODE_050 392.48 22.44 Marsh/Chamberlin_Line_003NODE_050 NODE_051 619.11 22.04 Marsh/ Chamberlin_Line_004DV04100 DV03704 642.4 16.18 Marsh/Chamberlin_Line_005DV03704 DV03705 225.44 16.18 Marsh/Chamberlin_Line_006DV03705 DV03706 312.92 16.18 Marsh/ Chamberlin_Line_007aDV03706 NODE_133 489.1 16.18 Marsh/Chamberlin_Line_008NODE_052 EFID_041 518.68 23.38 Marsh/Chamberlin_Line_009EFID_041 NODE_058 1084.55 23.38 Marsh/ Chamberlin_Line_011DV03702 DV03703 178.78 21.58 Marsh/Chamberlin_Line_012DV03703 DV04100 14.03 21.58 Marsh/Chamberlin_Line_013DV04100 EFID_032 5.72 4.05 Marsh/ Chamberlin_Line_014NODE_057 DV03900_2 112.53 23.38 Mathieson_Line_000E03800_E03803 US_ML 773.63 3.94 Mathieson_Line_001E03803 E03804 3.99 4.21 Mathieson_Line_002E03802 E03803 2465.2 4.21 Mobile_Home_Line_000C02213 US_MBH1 1111.39 4.53 Mobile_Home_Line_001C02214 EFID_055 273.99 4.21 Mobile_Home_Line_002EFID_055 C02214B 4.57 4.21

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Mobile_Home_Line_003C02214 C02214A 520.9 4.21 Mud_Alley_Line_000C03911 C03912 5.13 4.05 Mud_Alley_Line_001C03912 C03912a 1027.3 4.05 Mud_Alley_Line_002C03910 C03911 19.05 4.05 Nafsinger_Line_000EFID_006 EFID_005 543.28 4.21 Nafsinger_Line_001E06504 E06505 682.28 4.21 Nafsinger_Line_002E06503 E06504 14.22 4.21 Nafsinger_Line_003E06502 E06503 29.08 4.21 Nafsinger_Line_004EFID_005 E06502 4.08 4.21 Nafsinger_Line_005NODE_300 US_WCP 297.09 3.79 Nafsinger_Line_006E06501 EFID_006 115.47 4.05 Neal_Creek_Lateral_000NODE_005 M06200b

1203.02 4.13 Neal_Creek_Lateral_001C01100_2 NODE_005 277.17 4.13 Neal_Mill_Line_000EFID_050 C04007 534.55 6.19 Neal_Mill_Line_001C04007 C04008 24.79 4.21 Neal_Mill_Line_002C04000 US_NEML 2966.44 7.66 Neal_Mill_Line_003EFID_050 C04002 1307.76 6.19 Neal_Mill_Line_004C04004 C04005 11.98 4.21 Neal_Mill_Line_005NODE_014 C04004 520.67 4.21 Neal_Mill_Line_006C04002 C04003 378.73 6.19 Neal_Mill_Line_007C04003 NODE_014 905.2 4.21 Neal_Mill_Line_008NODE_014 C04006 615.69 4.21 Neal_Mill_Line_009NODE_013 C04001 713.03 4.21 Neal_Mill_Line_010NODE_013 EFID_050 271.25 8.06 Neufeldt_Line_000aC03601A NFL_US 1719.38 5.8 Neufeldt_Line_001NODE_204 C03601B_2 873.72 5.96 Nunamaker_Line_000C03500 C03501_2 4.52 9.87 Nunamaker_Line_001aC03501_2 NML_US 1384.27 8.68 Nunamaker_Line_002C03501_1 EFID_065 598.08 7.92 Nunamaker_Line_003EFID_066 C03501_1 7.5 8.06 Nunamaker_Line_004EFID_065 C03503 108.14 7.92 Nunamaker_Line_005C03503 C03504 372.28 7.75 Nunamaker_Line_006C03504 US_NML2 288.27 6.33 Nunamaker_Line_007C03505 EFID_062 1273.21 6.19 Nunamaker_Line_008EFID_062 EFID_061 107.63 6.19 Nunamaker_Line_009EFID_061 C03506 86.22 6.19 Nunamaker_Line_010C03506 EFID_060 448.71 6.19 Nunamaker_Line_011EFID_060 C03507 16.18 6.19 Nunamaker_Line_012C03507 C03508 251.69 6.19 Nunamaker_Line_013C03508 C03509 327.03 4.94 Nunamaker_Line_014C03509 C03510 210.11 4.94 Nunamaker_Line_015C03510 C03511 247.44 4.13 Nunamaker_Line_016C03511 C03512 120.3 4.13 Nunamaker_Line_017NODE_104 C03519 8.35 4.13 Nunamaker_Line_018C03516 C03517 217.97 4.13 Nunamaker_Line_019C03515 C03516 541.11 4.13 Nunamaker_Line_020C03512 EFID_056 184.03 4.13

 Link - Node Table: (continued) ---

Link Start End Length Diameter
ID Node Node ft in --
Nunamaker_Line_021EFID_056 C03513 13.05 4.13 Nunamaker_Line_022C03513 C03514 332.89 4.13 Nunamaker_Line_023C03514 C03515 116.38 4.13 Nunamaker_Line_024C03517 NODE_104 17.28 4.13 Nunamaker_Line_025C03519 C03520 1628.41 4.05 Nunamaker_Line_026NODE_104 C03518 183.53 4.13 Nunamaker_Line_027EFID_066 C03502 62.98 4.21 Oanna_000a C03300 O_US_2 1008.02 31.98 Oanna_000b O_DS_2 EFID_078 0.01 31.78 Oanna_001 EFID_078 C03400 2015.28 29.91
Oanna_002 C03400 EFID_071 1294.22 29.91
Oanna_003 EFID_071 C03301 713.53 31.23
Oanna_004 C03301 EFID_070 0.17 31.23
Oanna_006 C03500 EFID_068 1116.77 28.73
Oanna_007 EFID_068 EFID_067 4.04 28.73
Oanna_008 EFID_067 C03302A 9.55 7.75
Oanna_009b C03600_1 O_US_3 2660.66 26.98
Oanna_010 C03302A C03302B 0.41 5.96
Oanna_011a C03600_1 O_US_1 0.2 5.96
Oanna_012 C03600_2 C03601A 1519.81 5.96
Oanna_013 EFID_067 C03600_1 18.03 28.73 Omori_Line_001 C04901D C04901A 1.72 10.05 Omori_Line_002 C04901A C04901DA 729.82 6.08 Omori_Line_003 C04901DA C04901DB 845.25 6.08 Omori_Line_004 C04901DB C04901DD 120.68 4.13 Omori_Line_005 C04901DD C04901DC 5.86 4.13 Paasch_Line_000E05800 PL2_US 1078.21 9.06 Paasch_Line_001E05802_C_2 E05802_C_1 5.19 5.96 Paasch_Line_002E05802_A E05802_C_2 1345.38 7.75 Paasch_Line_003E05801_2 E05801_1 200.24 10.05 Paasch_Line_005E05802 E05802_A 1109.47 9.66 Poole_Line_000 NODE_131 DV04700 5.38 5.96 Poole_Line_001 DV04700 US_POL 687.68 5.8 Poole_Line_002 DV04701 DV04702 1828.27 4.05 Poole_Line_003 DV04702 DV04703 419.93 4.05 Rasmussen_Line_001E03301_AB E03301A 0.28 12.86 Rasmussen_Line_002E03301A NODE_001 607.43 12.59 Rasmussen_Line_003aNODE_001 RRL_US 942.23 11.3 Rasmussen_Line_004E03303 E03304 1342.53 10.05 Rasmussen_Line_005E03304 E03318_1 4.17 8.06 Rasmussen_Line_007E03318_1 EFID_040 1304.56 7.92 Rasmussen_Line_008EFID_040 NODE_136 4.08 7.92 Rasmussen_Line_009NODE_136 E03325 446.95 4.13 Rasmussen_Line_010E03304 E03305 836.91 6.08 Rasmussen_Line_011E03305 EFID_037 107.66 6.08 Rasmussen_Line_012EFID_037 E03306 260.43 6.08 Rasmussen_Line_013E03306 E03307 47.17 6.08

Link - Node Table: (continued) --

Link Start End Length Diameter ID Node Node ft in -- Rasmussen_Line_014E03307 EFID_036 18.14 6.08 Rasmussen_Line_015EFID_036 EFID_031 551.1 6.08 Rasmussen_Line_016EFID_031 E03308 245.03 6.08 Rasmussen_Line_017E03308 E03309 104.31 6.08 Rasmussen_Line_018E03309 E03310 254.21 6.08 Rasmussen_Line_019E03310 EFID_030 220.41 6.08 Rasmussen_Line_020EFID_030 E03313 286.84 4.13 Rasmussen_Line_021E03313 NODE_043 201.02 4.13 Rasmussen_Line_022NODE_136 E03320 632.13 6.08 Rasmussen_Line_023E03320 E03321 749.3 6.08 Rasmussen_Line_024E03321 E03322 232.74 6.08 Rasmussen_Line_025E03322 E03323 159.94 5.96 Rasmussen_Line_026E03323 EFID_029 820.23 4.05 Rasmussen_Line_027EFID_029 EFID_028 368.14 4.05

Rasmussen_Line_029EFID_028 E03324_1 264.51 4.05 Rasmussen_Line_030E03318_1 E03318_2 1445.66 4.21 Rasmussen_Line_031EFID_030 NODE_044 465.42 4.13 Rasmussen_Line_032E03314 E03315 684.69 4.05 Rasmussen_Line_034E03315 E03316 408.76 4.05 Rasmussen_Line_035E03316 E03317_1 256.8 4.05 Rasmussen_Line_036NODE_044 E03312 44.3 4.13 Rasmussen_Line_037NODE_044 E03311 50.53 4.13 Rasmussen_Line_038NODE_043 E03314 18.02 4.13 Rasmussen_Line_039NODE_001 E03301_B 144.76 5.96 Rasmussen_Line_040E03301_B E03302 1.69 4.83 Rasmussen_Line_041EFID_040 E03319_2 54.65 4.13 Rock_Acres_Line_000DV03900_2 DV03900_1 18.71 7.75 Rock_Acres_Line_001DV03900_1 US_RA 895.5 7.75 Rock_Acres_Line_002DV04000_DV03901DV03902 608.68 6.19 Rock_Acres_Line_003DV03903 DV03904 239.59 6.08 Rock_Acres_Line_004DV03902 DV03903 110.34 6.08 Rock_Acres_Line_005DV03904 DV03906 117.38 6.08 Rock_Acres_Line_006DV03905 DV03907 0.83 4.13 Rock_Acres_Line_007DV03908 NODE_054 5.24 4.13 Rock_Acres_Line_008DV03907 DV03908 62.95 4.13 Rock_Acres_Line_009DV03906 DV03905 0.34 4.13 Rock_Acres_Line_013NODE_054 DV03909AB 71.61 4.13 Shaw_Line_000 C03908 C03909 27.62 4.05 Shaw_Line_003 C03908 C03910 207.36 4.05 Shaw_Line_004 NODE_010 C03903 243.39 4.05 Shaw_Line_005 C03900 C03901 649.78 7.75 Shaw_Line_006 C03902 NODE_010 3.67 5.96 Shaw_Line_007 C03901 C03902 191.06 5.96 Shaw_Line_008 C03905_1 C03906 76.31 5.96 Shaw_Line_009 C03906 C03907 396.56 5.96 Shaw_Line_010 C03907 C03908 25.63 4.05 Shaw_Line_011 NODE_010 EFID_045 38.61 5.96

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
Shaw_Line_012 C03904 C03905_1 10.7 5.96 Shaw_Line_013 EFID_045 C03904 427.6 5.96 Sheirbon_Hill_Line_000DV03100 DV03000 5.38 7.75 Sheirbon_Hill_Line_002aDV03000 SHH_US 814.8 7.27 Sheirbon_Hill_Line_003EFID_053 DV03104 856.48 8.06 Sheirbon_Hill_Line_004DV03103 EFID_053 88.63 8.06 Sheirbon_Hill_Line_005DV03102 DV03103 59.27 8.06 Sheirbon_Hill_Line_006DV03104 EFID_052 1873.5 6.19 Sheirbon_Hill_Line_007EFID_052 DV03106A_D 215.69 4.13 Sheirbon_Hill_Line_008EFID_052 DV03105 133.28 4.21 Sheppard_Ditch_000EFID_086 NODE_109 710.92 5.8 Sheppard_Ditch_001NODE_110 DV01104 1466.94 5.96 Sheppard_Ditch_002DV01103 NODE_110 816.75 6.19 Sheppard_Ditch_003NODE_109 US_SHP2 439.66 5.89 Sheppard_Line_000bDS_SHP E06703B 1425.49 4.21 Sherrard_Road_Line_000EFID_077 C05400 2719.84 4.05 Shute_Road_Line_000DV05000_2 DV05000_1 6.41 6.19 Shute_Road_Line_001DV05000_1 DV05001 1165.15 5.96 Shute_Road_Line_002DV05001 DV05002 41.71 5.96 Shute_Road_Line_003DV05002 DV05003 109.87 6.08 Shute_Road_Line_004DV05003 DV05005 798.56 6.08 Shute_Road_Line_005DV05005 DV05006 723.36 6.08 Summit_Road_Line_000NODE_072 DV04205 675.13 4.21 Summit_Road_Line_001NODE_074 DV04209A_DV04209B 84.53 4.21 Summit_Road_Line_002Summit_Road_LineNODE_071 1280.72 8.06 Summit_Road_Line_003NODE_077 DV04300 3.65 4.21 Summit_Road_Line_004DV04300 DV04400 1131.89 4.13 Summit_Road_Line_005NODE_077 NODE_137 80.47 4.21 Summit_Road_Line_006NODE_071 DV04201 3.66 8.06 Summit_Road_Line_007DV04202 DV04203_DV04204 424.13 8.06 Summit_Road_Line_008DV04203_DV04204DV04206 565.06 6.19 Summit_Road_Line_009EFID_038 DV04202 17.9 8.06 Summit_Road_Line_010DV04201 EFID_038 163.22 8.06 Summit_Road_Line_011DV04206 NODE_072 193.75 6.19 Summit_Road_Line_012NODE_072 DV04207_DV04208 3.64 6.19 Summit_Road_Line_013DV04207_DV04208NODE_074 847.03 6.19 Summit_Road_Line_014NODE_074 DV04210 479 6.19 Summit_Road_Line_015DV04210 DV04211 0.41 6.19 Summit_Road_Line_016DV04211 NODE_077 291.63 4.21 Sweet_Line_000 EFID_051 DV03801 1575.68 4.13 Sweet_Line_001 EFID_051 NODE_123 570.1 6.19 Sweet_Line_002 NODE_123 DV03804 75.75 4.21 Sweet_Line_003 DV03804 DV03803 4.15 4.21 Sweet_Line_004 NODE_050 DV03800 22.68 6.19 Sweet_Line_005 DV03800 EFID_051 131.38 6.19 Sweet_Line_006 NODE_123 DV03802 19.49 4.21 Sweet_Line_007 DV03802 DV03805 22.97 4.21

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
Tallman_Line_000aNODE_024 TLL_US 864.98 3.79 Thomsen_Line_000E06300 US_TL2 1196.48 8.68 Thomsen_Line_001aEFID_008 TL_US 684.12 10.05 Thomsen_Line_002E06301_1 E06304 2963.3 4.83 Thomsen_Line_003E06304 E06301_2 1182.73 4.05 Thomsen_Line_006E06301_1 E06302 2.71 8.06 Thomsen_Line_007E06302 E06303 0.37 4.21 Tiffany_Line_000aNODE_026 TFL_US 1038.94 3.94 Webb_Drive_Line_000NODE_069 DV04806 87.89 4.13 Webb_Drive_Line_001DV04806 DV04807 111.03 4.13 Webb_Drive_Line_002DV04810 DV04811 66.17 4.05 Webb_Drive_Line_003DV04809 DV04810 483.22 4.05 Webb_Drive_Line_004DV04807 DV04808 74.64 4.13 Webb_Drive_Line_005DV04808 DV04809 44.85 4.13 Webb_Drive_Line_006NODE_067 DV04801 231.58 4.13

Webb_Drive_Line_007DV04802 DV04803 148.78 4.21 Webb_Drive_Line_008DV04801 DV04802 204 4.13 Webb_Drive_Line_009NODE_069 DV04805 254.2 4.13 Webb_Drive_Line_010DV04804 NODE_067 232.54 4.13 Webb_Drive_Line_011NODE_134 DV04804 5.26 4.94 Webb_Drive_Line_012NODE_067 NODE_069 460.67 4.13 Webster_Pressure_Line_000C04100 C04100A 1350.5 10.05 Webster_Pressure_Line_001C04100A EFID_013 1370.87 5.96 Webster_Pressure_Line_002EFID_013 C04100D 1121.93 4.05 Webster_Pressure_Line_003C04100A C04100B 1379.74 5.96 Webster_Pressure_Line_004EFID_013 C04100C 260.69 4.94 Webster_Pressure_Line_005EFID_020 C04100 9.26 10.05 Wheeler_Road_Line_000DV04004 DV04003 1029.02 4.05 Wheeler_Road_Line_001DV04003 DV04005 33.59 4.05 Wheeler_Road_Line_002DV04001 DV04002 123.3 6.08 Wheeler_Road_Line_003DV04002 DV04004 16.12 4.13 Wheeler_Road_Line_004DV04000_DV03901DV04001 354.69 6.19 Whiskey_Creek_Pipeline_001E06613 NODE_320 771.17 11.3 Whiskey_Creek_Pipeline_002NODE_320 US_WCP4 534.35 11.33 Whiskey_Creek_Pipeline_003E06615_E06614 E06616 42.08 10.05 Whiskey_Creek_Pipeline_004E06616 EFID_002 34.46 10.05 Whiskey_Creek_Pipeline_005EFID_002 NODE_139 764.62 9.87 Whiskey_Creek_Pipeline_006E06500 E06601_A 1519.18 7.75 Whiskey_Creek_Pipeline_007E06601_A E06602 406.39 7.75 Whiskey_Creek_Pipeline_009E06602 EFID_004 87.26 7.75 Whiskey_Creek_Pipeline_010EFID_004 E06603 230.25 7.75 Whiskey_Creek_Pipeline_012NODE_139 E06618 1468.53 7.92 Whiskey_Creek_Pipeline_013E06618 E06619 557.41 8.06 Whiskey_Creek_Pipeline_014E06619 US_LHP2 1115.56 7.66 Whiskey_Creek_Pipeline_015E06620 EFID_001 498.58 8.06 Whiskey_Creek_Pipeline_016aEFID_007 NODE_300 285.66 16.86 Whiskey_Creek_Pipeline_017NODE_330 E06607 780.93 14.38

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in ---
Whiskey_Creek_Pipeline_018E06606 E06608 477.84 14.38 Whiskey_Creek_Pipeline_019E06607 E06606 860.96 14.38 Whiskey_Creek_Pipeline_020E06608 EFID_098 387.57 12.59 Whiskey_Creek_Pipeline_021EFID_098 E06610 23.12 11.46 Whiskey_Creek_Pipeline_022E06610 EFID_003 21.28 11.46 Whiskey_Creek_Pipeline_023EFID_003 E06611 35.06 11.46 Whitesell_East_000C03905_1 C03905_2 682.15 4.05 Whitesell_West_000C03911 C03911a 583.36 4.05 Winklebleck_Line_000C01200 US_WLB3 1007.27 7.75 Winklebleck_Line_001aC01201 WL_US 1380.26 7.55 Winklebleck_Line_002C01202 C01203 568.39 8.06 Winklebleck_Line_003C01203 C01204 472.87 6.08 Winklebleck_Line_004C01204 C01205 323.93 5.96 Winklebleck_Line_005C01205 C01205A 5.15 5.96 Winklebleck_Line_006C01205A C01205B 245.54 4.05 Winklebleck_Line_007C01205B US_WBL4 943.2 3.88 Wy'east_Road_Line_000DV04400 DV04401_DV04402 227.28 4.13 Wy'east_Road_Line_001DV04403 DV04404 539.17 4.13 Wy'east_Road_Line_002DV04401_DV04402DV04403 151.9 4.13 Yasui_Line_000 EFID_078 C03400A 3617.1 7.92 Yasui_Line_001 C03400A C03400C 998.72 8.06 Yasui_Line_002 C03400B C03400D 467.83 6.19 Yasui_Line_003 C03400C C03400B 151.22 6.19 Lower_Highline_Pressure_004aE06621 E06702A_1 1766.44 5.96 Lower_Highline_Pressure_028bLHP_DS_2 E06705B 2.21 4.21 Thomsen_Line_001bTL_DS E06301_1 0.01 10.05 Kellly_Line_000bKL_DS EFID_009 1.32 4.21 Paasch_Line_004bPL_DS E05802 36.1 10.05 Eastside_Canal_024aE05300 E05500 396.19 23.88 Dethman/Swyers_Line_000bDSL_DS NODE_035 0.79 10.05 Rasmussen_Line_000aE03300 E03301_AB 886.53 12.86 Rasmussen_Line_003bRRL_DS E03303 1.46 11.92 Allison_Line_001bAL_DS C04901D 8.95 10.05
Oanna_005a EFID_070 C03500 1252.99 31.23 Nunamaker_Line_001bNML_DS EFID_066 0.21 8.06 Neufeldt_Line_000bNFL_DS NODE_204 6.77 6.19 Oanna_009a O_DS_3 C03700 1.86 28.04 Bietler_Line_002bBL_DS EFID_076 7.8 6.19 Winklebleck_Line_001bWL_DS C01202 25.62 8.06 Cherry_Hill_Line_002bCHH_DS DV02501_DV02502_DV02503 23.34 4.05 Sheirbon_Hill_Line_002bSHH_DS DV03102 12.66 8.06 Panorama_Point_Line_000NODE_045 E06612 9.15 4.21 Whiskey_Creek_Pipeline_024E06611 E06613 1304.14 11.46 Lariza_Line_000cNODE_045 E06609_B 546.81 6.19 Lariza_Line_000bDS_LRL NODE_045 1 6.19 Sheppard_Line_000aNODE_025 US_SHP 0.01 3.88 Tiffany_Line_000bTFL_DS E06702B_2 1.07 4.21

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in ---
Tallman_Line_000bTLL_DS E02600 3.46 4.21 Dethman_Ridge_Line_001bNODE_132 DRL_US 0.11 27.45 Oanna_011b O_DS_1 C03600_2 0.26 6.19 Thomsen_Line_001cTL_US TL_DS 1 10.05 Paasch_Line_004aE05801_1 PL_US 349.78 10.05 Paasch_Line_004cPL_US PL_DS 1 10.05 Crag_Rat_Line_002cCR_US_1 CR_DS_1 1 7.75 Neal_Mill_Line_002bDS_NEML NODE_013 1 8.06 Dethman_Ridge_Line_061bDS_DRL3 EFID_020 1 11.92 Bietler_line_002cBL_US BL_DS 1 6.19 Cherry_Hill_Line_002cCHH_US CHH_DS 1 4.05 Whiskey_Creek_Pipeline_006bNODE_300 NODE_330

4202.3 13.81 Whiskey_Creek_Pipeline_10bE06603 E06604 969.3370796 8.06
Central_Lateral_Pipeline_001bNODE_203 C01200 3203.11 72
Central_Lateral_Pipeline_001cC01200 C01300 1328.14 72 Whiskey_Creek_Pipeline_10cE06604 E06605 990.42 6.19 Main_Canal_Combine_000aReservoir_2 M04400 31519.65 51.208
Main_Canal_Combine_000bM04400 US_MC 4074.1 51.208 Main_Canal_035 C01100_2 M06200 10 45.217
V_LHP_2 LHP_US_2 LHP_DS_2 #N/A 6 Valve
V_LL_1 LL_US_1 LL_DS_1 #N/A 16 Valve V_SR_WB SR_WB_US SR_WB_DS #N/A 30 Valve V_EA_WB EA_WB_US EA_WB_DS #N/A 30 Valve V_CHL_2 CHL_US_2 NODE_007 #N/A 18 Valve V_CHL_1 CHL_US_1 CHL_DS_1 #N/A 10 Valve V_MC_WB MC_WB_US MC_WB_DS #N/A 66 Valve V_CP_WB_2 CP_WB_US_2 CP_WB_DS_2 #N/A 12 Valve V_DVP_1 DVP_US_1 DVP_DS_1 #N/A 30 Valve V_MCL_1 MCL_US_1 NODE_055 #N/A 22 Valve V_GL_1 GL_US_1 GL_DS_1 #N/A 6 Valve
V_KL KL_US KL_DS #N/A 4 Valve
V_DSL DSL_US DSL_DS #N/A 10 Valve
V_RRL RRL_US RRL_DS #N/A 12 Valve
V_O_2 O_US_2 O_DS_2 #N/A 28 Valve
V_O_3 O_US_3 O_DS_3 #N/A 30 Valve
V_NFL NFL_US NFL_DS #N/A 6 Valve
V_NML NML_US NML_DS #N/A 8 Valve
V_AL AL_US AL_DS #N/A 10 Valve
V_WL WL_US WL_DS #N/A 6 Valve
V_SHH SHH_US SHH_DS #N/A 8 Valve
V_O_1 O_US_1 O_DS_1 #N/A 6 Valve
V_LRL US_LRL DS_LRL #N/A 6 Valve V_TFL TFL_US TFL_DS #N/A 4 Valve
V_TLL TLL_US TLL_DS #N/A 4 Valve
V_DRL DRL_US DRL_DS #N/A 24 Valve
V_SHP US_SHP DS_SHP #N/A 4 Valve
V_WCP US_WCP E06501 #N/A 4 Valve

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
V_LHP E06702A_1 E06702B_1 #N/A 6 Valve
V_HUL E06617 NODE_031 #N/A 6 Valve
V_TL US_TL2 EFID_008 #N/A 10 Valve V_PL2 PL2_US E05801_2 #N/A 10 Valve
V_CR2 US_CR2 E04104 #N/A 6 Valve
V_CR3 EFID_022 NODE_042 #N/A 4 Valve
V_ML US_ML E03802 #N/A 4 Valve
V_NML2 US_NML2 C03505 #N/A 6 Valve
V_NEML US_NEML DS_NEML #N/A 8 Valve
V_DRL2 US_DRL2 C03737 #N/A 6 Valve
V_DRL3 US_DRL3 DS_DRL3 #N/A 12 Valve
V_BL2 US_BL2 C01701 #N/A 6 Valve
V_GL3 US_GL3 EFID_074 #N/A 4 Valve
V_WLB3 US_WLB3 C01201 #N/A 8 Valve
V_WBL4 US_WBL4 C01205C #N/A 4 Valve
V_CH3 US_CH3 DV01101 #N/A 8 Valve V_BUL3 US_BL3 C02218B #N/A 4 Valve
V_MBH1 US_MBH1 C02214 #N/A 12 Valve
V_DV3 US_DV3 DV03700 #N/A 16 Valve
V_CRLO US_CRLO DV05008 #N/A 6 Valve
V_POL US_POL DV04701 #N/A 6 Valve
V_RA US_RA DV04000_DV03901 #N/A 8 Valve
V_ACH US_ACH Summit_Road_Line #N/A 16 Valve
V_FS US_FS EFID_089 #N/A 4 Valve
V_CHL3 US_CHL3 EFID_058 #N/A 4 Valve
V_SHP2 US_SHP2 DV01103 #N/A 6 Valve
V_CLP US_CLP EFID_085 #N/A 30 Valve
V_CLP2 US_CLP2 C05300 #N/A 8 Valve
V_WCP2 NODE_300 E06500 #N/A 14 Valve V_WCP3 NODE_320 E06614 #N/A 4 Valve
V_LHP2 US_LHP2 E06620 #N/A 8 Valve
V_WCP4 US_WCP4 E06615_E06614 #N/A 12 Valve
V_MC US_MC M06200 #N/A 48 Valve

Node Results: --
Node Demand Head Pressure Quality
ID GPM ft psi --

E06707AB 53.00 539.30 83.13 0.00
E06707C 41.32 539.72 77.34 0.00
E06707E 24.23 540.90 67.16 0.00
E06707A 5.70 541.12 28.35 0.00
E06707D 9.11 541.06 30.89 0.00
NODE_027 0.00 541.09 28.89 0.00
E06706 7.41 544.83 26.73 0.00 E06705A 3.99 552.77 6.34 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
E06705B_2 4.85 549.45 10.27 0.00
E06705CD 54.71 552.73 6.20 0.00
E06705B 11.68 559.97 14.98 0.00
E06704 16.82 827.65 85.03 0.00
E06703B 110.59 598.23 35.98 0.00
E06703A 23.93 827.81 74.38 0.00
NODE_025 0.00 827.80 74.38 0.00
E06702B_1 0.00 833.14 40.00 0.00
E06702A_1 34.20 896.41 67.41 0.00 E06700 0.00 922.56 33.66 0.00
E06621 178.41 922.05 31.40 0.00
EFID_001 0.00 922.71 36.30 0.00
E06702B_2 11.68 657.51 40.02 0.00
NODE_026 0.00 833.13 40.14 0.00
E06620 57.00 925.90 70.00 0.00
E06702A 0.00 833.08 65.67 0.00
E06702A_2 9.69 833.04 83.81 0.00
E06619 41.03 957.21 28.22 0.00
E06618 11.40 961.93 50.13 0.00
E06617B 100.89 854.18 68.86 0.00
E06617 0.00 965.77 86.07 0.00
NODE_139 0.00 975.89 53.91 0.00
NODE_031 0.00 858.46 40.00 0.00
E06617A 102.60 849.58 85.69 0.00
EFID_002 0.00 979.85 50.05 0.00
E06616 262.77 980.02 48.32 0.00 E06615_E06614 75.81 980.33 50.08 0.00
NODE_320 0.00 982.87 107.86 0.00
E06613 140.21 986.86 36.93 0.00
E06609_B 380.19 749.13 36.29 0.00
E06609_A 5.70 749.13 37.32 0.00
E06612 28.50 754.70 39.49 0.00
E06611 6.16 994.49 49.52 0.00
NODE_045 0.00 754.70 40.03 0.00
EFID_003 0.00 994.69 49.59 0.00
E06610 51.87 994.82 49.70 0.00
E06608 105.44 997.38 50.09 0.00
EFID_098 0.00 994.96 49.80 0.00
E06606 5.70 999.11 50.35 0.00
E06607 84.93 1002.23 49.65 0.00
E06605 390.44 853.12 26.97 0.00
E06604 88.34 863.43 50.87 0.00
E06603 25.09 867.50 86.14 0.00 EFID_004 0.00 868.79 82.24 0.00
E06602 141.37 869.28 82.74 0.00
E06505 11.40 971.28 33.36 0.00
EFID_005 0.00 971.36 32.48 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
E06502 8.56 971.36 32.19 0.00
E06503 5.70 971.35 32.60 0.00
E06504 5.70 971.35 32.67 0.00
E06304 106.59 716.95 80.88 0.00

E06301_2 99.19 709.27 79.50 0.00
E06601_A 13.69 872.86 86.29 0.00 EFID_006 0.00 971.71 97.03 0.00
E06501 95.77 971.80 95.00 0.00
EFID_007 0.00 1026.23 64.59 0.00
E06500 0.00 886.81 50.00 0.00
EFID_008 0.00 751.41 20.00 0.00
E06301_1 0.00 748.49 40.43 0.00
E06302 503.89 748.47 40.61 0.00
E06303 151.61 748.47 40.61 0.00
E06300 0.00 1027.42 42.33 0.00
E06200 137.93 1028.98 48.35 0.00
E06100 128.81 1029.52 48.47 0.00
EFID_009 0.00 766.30 40.03 0.00
E06000_1 142.78 749.18 62.63 0.00
E06000_2 0.00 1030.22 47.70 0.00
NODE_034 0.00 1030.22 47.70 0.00
E05900 347.13 1030.75 48.54 0.00
E04920_A 99.19 732.22 71.10 0.00 E04920_B 98.03 731.94 72.28 0.00
E04921 36.49 747.42 69.95 0.00
E04918 1.13 736.38 69.91 0.00
EFID_101 0.00 747.72 69.86 0.00
E05802 0.00 829.92 46.97 0.00
E05801_1 111.44 831.37 28.39 0.00
E05800 0.00 1033.10 49.02 0.00
E05700 82.09 1033.33 49.46 0.00
E04917 143.63 736.38 69.33 0.00
E04920_C 0.57 746.86 69.57 0.00
E05801_2 58.13 832.32 20.00 0.00
E05802_A 189.23 824.90 81.89 0.00
E05802_C_1 407.56 814.02 90.39 0.00
E05802_C_2 205.77 814.09 90.51 0.00
E05500_F 93.49 754.17 46.65 0.00
E05600 486.79 1035.46 50.05 0.00
E05500_CDE 336.30 755.66 43.10 0.00 E05500 0.00 1037.48 50.36 0.00
E04919_AB 208.91 756.80 66.87 0.00
NODE_035 0.00 759.91 40.02 0.00
EFID_102 0.00 761.40 65.42 0.00
EFID_103 0.00 759.95 64.11 0.00
E04916 396.16 760.11 64.06 0.00
E05400 181.27 1038.68 50.95 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
E05300 296.40 1038.65 50.94 0.00
E05500_AB 397.01 756.45 37.67 0.00
E04915 1.13 763.22 63.63 0.00 E05200 117.14 1040.56 51.34 0.00
E04914 110.59 767.19 61.11 0.00
E04913 156.19 769.29 60.91 0.00
E04912 100.89 770.05 60.11 0.00
EFID_010 0.00 770.29 60.06 0.00
E05100 286.13 1044.10 51.41 0.00
E05000 78.09 1045.58 52.27 0.00
E04911 117.14 770.21 52.40 0.00
E04900 0.00 1046.62 52.45 0.00
EFID_011 0.00 777.63 60.50 0.00
E04905 123.69 784.33 50.03 0.00
EFID_096 0.00 1046.62 52.45 0.00
NODE_039 0.00 783.58 59.11 0.00
E04907_2 176.42 780.56 63.72 0.00
E04906 10.55 783.57 58.63 0.00
E04908_1 113.72 769.25 57.42 0.00
EFID_104 0.00 770.72 52.47 0.00 E04910 752.12 771.55 53.12 0.00
E04901 54.16 1045.47 58.38 0.00
EFID_012 0.00 792.65 25.21 0.00
E04903A 670.31 1042.31 63.98 0.00

E04903B 805.69 1042.55 60.88 0.00
E04909 112.01 772.00 58.41 0.00
E04902 201.79 1043.11 59.55 0.00
C03746 418.94 841.03 81.72 0.00
E04904 9.11 792.62 38.57 0.00
NODE_040 0.00 774.38 59.95 0.00
E04800 218.03 1048.94 52.99 0.00
E04700 106.01 1049.26 53.10 0.00
E04600 201.79 1049.69 53.43 0.00
E04500 162.46 1050.52 53.43 0.00
C03745 184.69 857.34 77.77 0.00
DV04621 0.00 827.21 67.51 0.00
C03736 597.37 899.24 64.51 0.00 C03734 311.21 899.43 64.14 0.00
C03733 3.99 899.47 63.96 0.00
C03735 1.13 899.36 64.10 0.00
DV04620 206.33 827.24 67.51 0.00
EFID_013 0.00 849.47 71.81 0.00
NODE_064 0.00 827.09 67.72 0.00
DV04621A 2.86 827.08 67.86 0.00
DV04621B 80.37 826.45 67.68 0.00
C03732 48.44 894.02 59.36 0.00
C04100C 210.33 846.88 66.08 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
EFID_014 0.00 827.97 67.61 0.00
E04400 5.70 1051.30 53.29 0.00
E04300_1 77.24 1051.91 53.42 0.00
E04300_2 11.40 1051.85 53.29 0.00
C04100D 125.97 838.12 78.55 0.00
NODE_016 0.00 896.17 48.09 0.00
E04100 0.00 1052.97 53.91 0.00
E04105a 37.04 749.31 48.17 0.00
E04104 0.00 756.04 40.00 0.00
E04105b 25.64 749.31 48.17 0.00
E04104_a 27.93 756.04 39.99 0.00
DV04619 131.67 832.11 67.17 0.00
E04101 253.09 1036.17 50.85 0.00
DV04618 86.07 832.28 67.23 0.00
EFID_015 0.00 895.91 47.95 0.00
C03730 190.94 895.72 47.70 0.00
EFID_016 0.00 903.59 59.78 0.00 C03744 112.01 863.99 63.40 0.00
EFID_017 0.00 903.95 58.92 0.00
E04200 324.90 1052.93 53.60 0.00
E04105 197.21 749.93 48.21 0.00
E04104_b 5.70 756.04 40.02 0.00
NODE_015 0.00 896.19 48.34 0.00
NODE_041 0.00 1036.15 50.94 0.00
C03731 129.97 886.93 50.26 0.00
C03729 106.59 904.17 58.38 0.00
DV04703 91.20 805.89 77.54 0.00
DV04702 81.51 808.23 70.87 0.00
C03743 112.58 867.85 49.64 0.00
EFID_100 0.00 865.42 58.80 0.00
E04000 11.40 1054.08 53.84 0.00
DV04609 160.17 852.61 39.42 0.00
DV04608 200.63 852.64 38.81 0.00
DV04616 141.93 840.80 61.74 0.00 EFID_018 0.00 839.31 65.57 0.00
EFID_019 0.00 836.98 70.42 0.00
DV04615 26.21 841.21 61.26 0.00
DV04614 28.50 841.42 60.55 0.00
E04103B 23.93 849.95 90.64 0.00
E04103A_1 102.03 850.25 91.86 0.00
EFID_020 0.00 868.91 40.03 0.00
C04100 0.00 868.86 39.80 0.00

C04100B 324.90 850.20 73.96 0.00
C04100A 249.95 862.49 58.37 0.00
NODE_059 0.00 852.85 39.14 0.00
DV04602 67.83 867.54 44.17 0.00
DV04617 7.99 836.94 72.89 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality ID GPM ft psi --- EFID_022 0.00 995.88 77.51 0.00
E03900 284.43 1054.61 53.49 0.00
E03800_E03803 0.00 1054.94 53.70 0.00
E03801 348.27 1054.94 53.70 0.00
C03742 5.13 918.01 53.90 0.00
NODE_042 0.00 862.11 20.00 0.00
E03317_1 3.41 795.56 67.12 0.00
DV04701 129.68 841.41 10.00 0.00
E04103A_2 53.01 860.25 77.57 0.00
DV04611 28.50 850.94 49.89 0.00
DV04610 115.43 858.47 31.71 0.00
DV04612 27.37 850.27 50.60 0.00
DV04613 33.07 847.27 60.75 0.00
EFID_023 0.00 847.33 60.58 0.00 C03728 84.93 909.93 44.19 0.00
C03741 395.59 918.58 55.59 0.00
C03727 282.71 910.28 43.33 0.00
DV04607 98.33 860.44 32.55 0.00
E03316 13.11 795.56 65.56 0.00
DV04808 25.64 831.69 58.86 0.00
DV04806 5.70 833.95 59.08 0.00
DV04807 5.70 832.56 59.19 0.00
DV04809 5.70 831.33 59.44 0.00
DV04801 15.39 842.03 60.09 0.00
DV04802 8.56 842.00 51.77 0.00
DV04811 80.93 827.12 62.12 0.00
C03740 25.64 789.56 32.55 0.00
DV04805 11.40 835.10 60.31 0.00
DV04803 5.70 842.00 48.66 0.00
DV04804 14.81 847.01 60.41 0.00
NODE_060 0.00 858.88 30.07 0.00 NODE_067 0.00 842.18 56.87 0.00
NODE_069 0.00 835.13 59.21 0.00
NODE_134 0.00 847.06 60.52 0.00
NODE_056 0.00 870.92 10.05 0.00
DV04810 30.79 827.41 61.46 0.00
C03726 85.50 911.44 40.68 0.00
E03311 49.59 798.65 59.97 0.00
E03312 54.44 798.65 61.05 0.00
E03802 57.57 970.48 60.00 0.00
E03315 55.58 795.65 66.47 0.00
C03738_C03739 60.14 789.60 39.46 0.00
DV04005 35.91 962.84 82.02 0.00
DV04700 0.00 1074.56 85.09 0.00
DV04601 138.51 1074.34 85.56 0.00
DV04003 2.86 962.87 81.54 0.00
DV04603 213.19 1073.22 87.36 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality
ID GPM ft psi --
DV04604 215.47 866.53 26.19 0.00
DV04605 264.49 866.33 25.91 0.00
EFID_024 0.00 862.27 35.64 0.00
DV05006 5.70 1056.78 55.49 0.00
DV05007 1.13 1050.14 70.72 0.00
DV05008 112.29 969.53 40.00 0.00
DV05009 112.29 949.42 57.20 0.00

DV04606 105.74 857.90 44.23 0.00
DV05010 53.01 945.55 60.25 0.00
EFID_026 0.00 920.90 53.42 0.00 C03725 218.89 913.09 36.52 0.00
EFID_027 0.00 920.91 53.44 0.00
C03724 378.19 920.92 53.30 0.00
NODE_044 0.00 798.73 60.65 0.00
NODE_055 0.00 870.95 10.00 0.00
NODE_131 0.00 1074.60 84.78 0.00
NODE_133 0.00 1076.06 77.25 0.00
C03737 159.60 790.87 40.00 0.00
EFID_028 0.00 771.24 57.05 0.00
E03324_1 178.41 766.14 69.05 0.00
E03314 25.09 798.12 61.55 0.00
E03313 21.67 799.37 60.67 0.00
EFID_029 0.00 778.33 56.43 0.00
EFID_030 0.00 801.73 59.55 0.00
DV03706 80.93 1077.99 76.89 0.00
E03803 5.70 970.30 55.00 0.00
E03804 3.99 970.30 55.49 0.00 E03310 9.11 802.62 60.89 0.00
C03723 108.58 921.59 51.89 0.00
NODE_043 0.00 798.22 61.35 0.00
DV03705 5.70 1079.29 77.50 0.00
DV05005 88.91 1061.35 62.35 0.00
E03700 25.64 1056.95 52.88 0.00
E03309 17.10 803.72 62.75 0.00
DV03704 133.96 1080.23 77.34 0.00
DV04534 173.84 859.37 28.71 0.00
E03308 9.69 804.24 64.03 0.00
DV04533 305.51 868.90 45.80 0.00
DV04004 139.64 964.05 65.01 0.00
DV04002 94.91 964.33 64.37 0.00
E03323 113.43 794.14 64.51 0.00
EFID_031 0.00 805.54 58.20 0.00
E03600 536.37 1057.89 53.96 0.00
DV04001 1.71 965.05 60.46 0.00 E03322 61.57 795.31 59.77 0.00
DV04527 2.29 875.75 52.18 0.00
C04005 142.50 740.92 37.47 0.00

Node Results: (continued) ---

Node Demand Head Pressure Quality
ID GPM ft psi ---
E03321 5.70 797.51 59.13 0.00
DV03906 17.10 962.77 67.16 0.00
DV03907 119.42 962.74 67.15 0.00
DV04100 0.00 1083.13 78.71 0.00
DV03908 9.11 962.49 67.44 0.00
DV03909AB 71.26 962.24 67.35 0.00
DV03703 11.40 1083.17 78.85 0.00 DV03905 3.99 962.76 67.16 0.00
DV03904 4.57 963.23 66.62 0.00
EFID_032 0.00 1083.13 78.77 0.00
DV03902 0.57 964.67 59.90 0.00
DV03903 0.57 964.22 62.83 0.00
DV04501 186.68 893.67 13.98 0.00
Summit_Road_Line 0.00 897.81 15.00 0.00
EFID_033 0.00 888.23 36.97 0.00
DV04503 218.89 891.94 21.72 0.00
DV04504 58.43 891.85 22.05 0.00
DV04505 108.30 884.92 44.38 0.00
DV04530 1.71 872.93 45.44 0.00
DV04532 2.86 870.94 47.43 0.00
C03721 91.20 906.07 24.74 0.00
C03722 2.86 906.08 24.81 0.00
C03719 112.58 913.88 28.85 0.00
EFID_034 0.00 923.67 43.52 0.00 EFID_035 0.00 913.91 28.87 0.00
C03720_C03720a 116.29 906.04 24.33 0.00
C04004 2.29 741.05 37.47 0.00

DV05003 3.41 1069.70 66.29 0.00
DV04000_DV03901 0.57 966.98 40.00 0.00
C04006 21.67 746.49 47.06 0.00
C03717_C03718 5.42 913.79 29.82 0.00
C03716 47.59 913.76 29.72 0.00
DV03702 5.70 1083.69 77.39 0.00
DV05002 0.57 1070.87 71.49 0.00
EFID_036 0.00 808.46 56.16 0.00
DV05001 2.86 1071.36 72.87 0.00
E03307 135.38 808.56 56.30 0.00
E03306 14.24 809.10 56.09 0.00
DV04506 7.13 878.51 58.59 0.00
DV04507 17.10 877.20 55.53 0.00
DV04529 38.19 876.37 53.44 0.00 DV04528 9.11 873.33 45.95 0.00
DV04531 4.28 871.70 46.59 0.00
NODE_014 0.00 746.69 39.16 0.00
NODE_054 0.00 962.47 67.43 0.00
DV04502 3.14 897.71 15.01 0.00
NODE_093 0.00 870.97 47.36 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality
ID GPM ft psi --
DV04547_DV04546 4.57 855.99 74.78 0.00
NODE_122 0.00 906.08 24.74 0.00
NODE_130 0.00 913.91 28.87 0.00
DV03701 5.70 1084.53 77.59 0.00 DV03900_1 0.00 1084.47 77.92 0.00
DV03900_2 0.00 1084.57 77.80 0.00
E03500 141.93 1058.93 54.09 0.00
EFID_037 0.00 812.32 56.19 0.00
DV04537 41.61 857.67 49.47 0.00
E03305 15.97 813.65 56.57 0.00
DV04536 3.14 861.28 47.62 0.00
DV04535 5.70 863.61 48.43 0.00
DV04543 42.74 856.18 52.25 0.00
Hernandez_Line 0.00 870.38 58.93 0.00
EFID_106 0.00 869.69 60.56 0.00
DV04509 27.93 869.53 61.33 0.00
DV04510 3.99 869.41 61.99 0.00
DV04523 1.71 868.42 55.87 0.00
NODE_057 0.00 1084.84 77.24 0.00
NODE_058 0.00 1085.10 77.43 0.00
NODE_095 0.00 856.15 52.46 0.00 NODE_096 0.00 856.01 65.04 0.00
DV04545 1.99 856.00 76.89 0.00
DV04508 7.13 870.58 58.62 0.00
C03715 144.49 925.34 68.99 0.00
E03320 77.51 804.80 58.88 0.00
DV04905 51.30 1083.42 13.50 0.00
C04003 222.87 759.39 40.94 0.00
DV04906 2.86 1082.81 16.01 0.00
DV04544B 1.42 856.00 77.45 0.00
DV04511 4.28 869.27 61.04 0.00
DV04512 4.57 868.98 58.07 0.00
DV04513 1.99 868.97 57.97 0.00
DV04514 3.99 868.90 57.59 0.00
DV04519 14.24 868.58 61.68 0.00
DV04522 1.43 868.42 57.36 0.00
DV04521 1.43 868.42 58.46 0.00
DV04520 13.96 868.42 59.39 0.00 DV04524 1.43 868.41 60.84 0.00
NODE_091 0.00 868.60 62.10 0.00
NODE_094 0.00 868.42 59.02 0.00
DV04544A 9.11 855.99 65.48 0.00
NODE_092 0.00 868.59 63.25 0.00
DV04518 21.67 868.47 61.05 0.00
C03714 171.00 926.65 67.04 0.00
DV05000_1 11.40 1085.25 12.89 0.00

DV05000_2 0.00 1085.31 12.48 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi --
E03325 57.00 812.69 57.48 0.00 DV04904A_B 157.31 1085.51 14.75 0.00
DV04201 113.72 888.02 14.53 0.00
EFID_038 0.00 887.14 15.78 0.00
DV04211 96.90 862.71 39.01 0.00
DV04207_DV04208 41.61 874.14 18.13 0.00
DV04300 0.00 857.38 39.86 0.00
DV04210 29.93 862.71 39.01 0.00
C03806 5.13 913.90 31.45 0.00
DV04203_DV04204 62.98 884.93 19.85 0.00
DV04206 4.28 876.89 18.02 0.00
DV04400 0.00 849.12 47.83 0.00
DV03801 29.93 1089.38 67.81 0.00
E03400 62.70 1060.28 53.93 0.00
DV04209A_DV04209B 52.43 865.99 32.65 0.00
DV04303 39.90 856.99 40.31 0.00
C03804 363.38 909.92 51.22 0.00
DV04301 22.23 857.08 39.86 0.00 DV04903 155.03 1085.80 12.06 0.00
EFID_039 0.00 913.90 33.92 0.00
EFID_040 0.00 813.65 61.43 0.00
C04002 2.86 763.32 37.04 0.00
DV04202 21.67 887.05 16.26 0.00
DV04515 5.70 868.81 57.17 0.00
DV04516 26.21 868.81 57.21 0.00
DV04525 3.41 868.40 63.97 0.00
DV04526 3.71 868.40 62.95 0.00
C03805 5.70 913.89 13.05 0.00
NODE_011 0.00 913.90 33.26 0.00
NODE_012 0.00 913.90 32.78 0.00
NODE_071 0.00 888.05 14.51 0.00
NODE_072 0.00 874.18 18.17 0.00
NODE_074 0.00 866.12 33.43 0.00
NODE_075 0.00 857.08 39.74 0.00
NODE_076 0.00 857.02 40.10 0.00 NODE_077 0.00 857.40 39.82 0.00
NODE_137 0.00 857.11 39.72 0.00
NODE_136 0.00 813.63 61.25 0.00
NODE_089 0.00 857.02 40.11 0.00
C03713 143.63 928.30 42.52 0.00
E03304 110.01 824.74 54.56 0.00
C03803 50.17 915.17 37.55 0.00
DV04401_DV04402 57.28 847.46 47.47 0.00
E03303 276.44 835.71 40.00 0.00
EFID_041 0.00 1087.63 82.65 0.00
DV04403 49.01 847.17 47.12 0.00
NODE_001 0.00 1055.29 75.57 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi --
E03301_B 72.39 1054.34 67.57 0.00
E03302 202.36 1054.32 67.56 0.00
E03319_2 174.41 812.73 59.07 0.00
DV04538_DV04539 26.79 854.95 65.79 0.00
DV04540 4.57 854.95 63.85 0.00
DV0454_DV04542 10.27 854.94 64.73 0.00
E03318_1 0.00 824.71 54.62 0.00
DV04302 18.23 856.58 49.09 0.00
DV04907 448.59 1081.05 23.36 0.00
C03712 183.53 929.50 16.64 0.00

DV04908 0.57 1080.84 25.83 0.00
E03301A 19.94 1058.58 50.12 0.00
E03301_AB 0.00 1058.58 50.12 0.00
NODE_051 0.00 1089.55 63.59 0.00
NODE_052 0.00 1088.84 75.68 0.00 DV04205 45.60 873.32 24.79 0.00
DV04404 4.85 847.16 47.95 0.00
EFID_042 0.00 930.04 5.81 0.00
EFID_043 0.00 925.15 23.18 0.00
C03900 0.00 925.30 24.15 0.00
DV04902 1.13 1087.67 11.64 0.00
C03909 59.86 910.96 80.73 0.00
C04000 0.00 930.41 17.28 0.00
C03907 114.85 911.46 81.25 0.00
C03901 98.03 921.81 79.77 0.00
C03902 45.32 919.36 81.73 0.00
EFID_045 0.00 918.96 81.75 0.00
C03905_1 3.41 914.80 81.79 0.00
C03906 29.63 914.17 81.69 0.00
C03904 8.56 914.89 81.21 0.00
C03711 179.56 930.63 25.43 0.00
DV03805 92.33 1086.56 44.71 0.00 DV03802 111.16 1086.67 44.61 0.00
C03908 30.21 911.03 81.03 0.00
NODE_010 0.00 919.33 81.78 0.00
C03802 54.16 927.35 22.71 0.00
DV03803 51.30 1086.77 47.10 0.00
DV03804 30.79 1086.78 46.92 0.00
EFID_046 0.00 930.99 36.00 0.00
EFID_047 0.00 930.95 36.53 0.00
C03911 0.00 910.16 81.61 0.00
C03910 23.65 910.20 81.72 0.00
C03912 23.93 910.16 82.00 0.00
C03800 0.00 931.01 36.43 0.00
C03801 51.30 928.60 22.71 0.00
EFID_048 0.00 928.95 22.86 0.00
EFID_049 0.00 929.99 27.50 0.00

Node Demand Head Pressure Quality
ID GPM ft psi ---
C03903 13.39 919.29 85.29 0.00
EFID_050 0.00 777.04 36.73 0.00
C03710 11.40 931.17 40.83 0.00
C04007 235.99 774.60 32.87 0.00
C04008 14.24 774.60 32.61 0.00
C03520 65.54 843.04 74.90 0.00
DV03800 0.00 1091.32 25.51 0.00
EFID_051 0.00 1090.39 25.30 0.00
E03300 0.00 1063.01 54.51 0.00
EFID_052 0.00 1002.96 53.07 0.00
DV03106A_D 134.81 1000.71 55.11 0.00
E03200C 34.20 1063.04 54.41 0.00 E03318_2 22.80 824.20 54.85 0.00
NODE_050 0.00 1091.47 27.19 0.00
NODE_123 0.00 1087.07 46.18 0.00
NODE_013 0.00 779.01 40.01 0.00
DV03105 198.93 1000.35 50.19 0.00
C03905_2 13.69 914.68 85.98 0.00
E03200A 13.11 1063.58 54.42 0.00
C03911a 24.23 909.88 84.31 0.00
C03912a 4.57 910.13 85.92 0.00
DV04900 0.00 1252.10 78.60 0.00
DV03700 0.00 1092.71 10.00 0.00
DV03600 46.73 1252.13 78.44 0.00
C03709 184.11 932.25 57.40 0.00
DV03500 76.39 1252.59 80.38 0.00
DV03400 0.00 1252.62 80.42 0.00
E03200B 9.11 1063.49 54.37 0.00

C04001 16.25 778.87 34.53 0.00 DV03300 17.10 1253.02 80.45 0.00
DV04901 342.00 1091.05 12.51 0.00
DV03104 148.20 1017.54 51.03 0.00
C03708 59.86 931.51 96.08 0.00
C03707 163.59 933.34 81.85 0.00
NODE_008 0.00 933.26 79.44 0.00
E03100 6.83 1064.82 54.07 0.00
DV04909 106.59 1079.45 33.06 0.00
DV03200 66.98 1253.96 80.69 0.00
DV03102 28.50 1021.91 24.98 0.00
DV03103 99.19 1021.56 31.69 0.00
EFID_053 0.00 1021.18 37.67 0.00
E03000B 417.81 1065.20 54.65 0.00
C02218C 103.73 885.14 52.42 0.00
E03000A 5.70 1065.29 51.44 0.00
EFID_095 0.00 1064.81 54.32 0.00
NODE_117 0.00 1065.29 53.40 0.00 EFID_054 0.00 1067.91 55.58 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
E02900 124.27 1068.56 54.77 0.00
C03519 1.13 847.95 57.10 0.00
C03518 15.11 847.94 56.55 0.00
DV04910 2.86 1079.31 32.63 0.00
C03517 5.70 848.05 57.01 0.00
DV03000 11.40 1255.90 81.12 0.00
DV03100 0.00 1255.94 81.15 0.00
DV04911 0.57 1079.26 43.43 0.00
C03516 30.79 849.07 57.14 0.00 NODE_104 0.00 847.97 56.99 0.00
C02218B 17.10 889.41 40.00 0.00
E02800 91.20 1069.51 54.80 0.00
DV04912_DV04913 1.13 1079.18 52.39 0.00
C02214B 77.51 852.64 43.31 0.00
DV02900 85.50 1257.38 80.52 0.00
EFID_055 0.00 852.65 42.83 0.00
E02700 29.63 1069.87 54.90 0.00
DV02800 155.03 1257.74 79.42 0.00
DV04914 2.86 1079.10 40.68 0.00
DV02700 31.91 1257.85 80.15 0.00
C02214A 25.64 853.36 48.25 0.00
C03706_1 0.00 936.86 93.13 0.00
C03514 13.69 854.67 56.39 0.00
C03706_2 27.37 937.26 83.82 0.00
DV04915 2.86 1079.07 39.59 0.00
C03702 23.37 937.26 83.80 0.00 C03704_C03705 18.23 937.26 83.80 0.00
DV04916 74.10 1079.04 35.79 0.00
C02217 27.37 1069.19 79.56 0.00
C02218A 213.76 1067.34 90.04 0.00 DV02501_DV02502_DV02503 147.63 1090.25 91.68 0.00
C02214 42.19 853.58 40.00 0.00
C03515 14.24 853.49 56.50 0.00
E02600 1.71 855.91 40.00 0.00
NODE_024 0.00 1072.78 56.56 0.00
C03513 24.23 858.70 56.84 0.00
EFID_056 0.00 858.91 56.77 0.00
DV04917 2.86 1077.81 35.90 0.00
C03512 13.69 861.88 56.98 0.00
DV02600 3.41 1259.81 80.41 0.00
NODE_112 0.00 1079.03 35.70 0.00
C03511 11.40 864.11 58.14 0.00 C03510 18.23 869.25 58.17 0.00
C02216 94.61 1076.87 52.44 0.00
C03701B 254.21 1122.59 43.16 0.00
C03701A 245.10 1122.61 42.92 0.00
NODE_132 0.00 1122.60 43.16 0.00

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Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi ---
EFID_057 0.00 1104.76 40.34 0.00
EFID_058 0.00 1104.88 40.00 0.00
DV04918 11.40 1077.36 21.57 0.00
C02213 96.90 1080.34 75.66 0.00
C03509 2.29 871.40 56.67 0.00 C03700 0.00 1123.31 40.02 0.00
C03601B_2 271.89 1011.76 90.70 0.00
DV02500 0.00 1265.41 80.50 0.00
C02215 104.31 1088.28 45.79 0.00
E02500 126.53 1074.94 56.73 0.00
DV02400 118.57 1265.45 79.80 0.00
C03508 8.56 874.81 56.41 0.00
DV04919 74.38 1077.02 44.18 0.00
EFID_059 0.00 1082.56 61.20 0.00
C02212 79.80 1082.60 60.71 0.00
C03507 8.56 875.75 47.48 0.00
EFID_060 0.00 875.82 46.81 0.00
E02400 15.97 1075.63 56.94 0.00
NODE_204 0.00 1017.36 25.01 0.00
E02300 43.89 1075.94 57.09 0.00
C03506 136.23 877.61 36.84 0.00
EFID_061 0.00 878.42 36.37 0.00 C03505 66.11 891.40 35.00 0.00
EFID_062 0.00 879.43 36.32 0.00
DV02300 139.09 1270.06 83.67 0.00
C03601A 96.33 1227.02 73.29 0.00
EFID_064 0.00 1094.20 25.04 0.00
C03504 55.87 1039.27 86.82 0.00
C02211AB 380.77 1199.69 67.95 0.00
E02200 62.70 1079.81 57.74 0.00
C03503 108.87 1041.26 65.76 0.00
EFID_065 0.00 1042.01 63.34 0.00
DV02200 5.70 1271.87 84.13 0.00
DV02100 14.81 1272.10 82.94 0.00
DV02000 19.39 1272.65 83.75 0.00
E02000 13.11 1080.44 56.82 0.00
EFID_066 0.00 1046.21 40.03 0.00
C03501_1 0.00 1046.16 40.18 0.00
E02100 68.40 1081.04 58.04 0.00 C03502 137.93 1045.59 39.82 0.00
DV01900 79.23 1274.61 84.32 0.00
C03600_1 0.00 1373.85 81.25 0.00
C03302A 262.20 1373.82 80.66 0.00
C03302B 300.39 1373.82 80.66 0.00
C03600_2 0.00 1244.09 25.03 0.00
EFID_067 0.00 1373.88 79.26 0.00
EFID_068 0.00 1373.89 78.97 0.00

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Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi ---
C02207A_F 889.77 1218.46 17.86 0.00
NODE_129 0.00 1219.96 23.21 0.00 C02208 42.19 1212.61 41.87 0.00
C02210A_B 461.13 1206.02 58.40 0.00
C02209 224.01 1212.35 41.54 0.00
C02206 1.71 1220.04 25.31 0.00
E01900 2.86 1082.48 56.34 0.00
C03400D 219.46 1349.06 28.50 0.00
E01209 142.50 1081.00 55.64 0.00
E01208 3.41 1081.13 55.67 0.00
EFID_094 0.00 1082.58 56.05 0.00
DV01800A_D 70.11 1278.47 83.06 0.00
DV01700 74.67 1278.70 83.07 0.00
C02205 251.37 1221.01 42.57 0.00

C03501_2 171.00 1376.41 69.96 0.00
C03500 0.00 1376.43 69.53 0.00
E01207 14.81 1083.38 56.83 0.00
EFID_069 0.00 1083.42 56.86 0.00
E01205 1.13 1088.44 57.37 0.00 E01206 1.13 1088.29 58.76 0.00
C02204 193.80 1221.45 45.58 0.00
E01204 17.67 1088.88 57.70 0.00
E01203 34.20 1089.42 58.78 0.00
E01202 3.14 1090.69 74.42 0.00
C03400B 105.44 1350.73 31.36 0.00
C02203 69.83 1222.18 46.11 0.00
C03400C 228.00 1351.85 32.82 0.00
E01201 2.56 1091.37 82.95 0.00
DV01600 153.33 1280.75 85.65 0.00
EFID_070 0.00 1378.67 69.85 0.00
C03301 101.47 1378.67 69.85 0.00
DV01500 83.21 1281.73 85.05 0.00
DV01400 155.03 1281.92 85.37 0.00
C02202 102.60 1225.97 44.89 0.00
C03400A 108.30 1357.33 51.85 0.00
C04901DD 51.30 1447.04 62.18 0.00 C04901DB 193.80 1447.79 64.09 0.00
EFID_071 0.00 1379.97 47.35 0.00
C02201 134.51 1210.41 54.90 0.00
DV01300 114.00 1285.76 85.17 0.00
C04901DC 50.73 1447.03 62.42 0.00
NODE_007 0.00 1227.62 40.00 0.00
DV01200 63.83 1286.03 85.78 0.00
C04901DA 79.80 1453.54 69.34 0.00
EFID_400 0.00 1105.68 10.06 0.00
E01200 0.00 1105.59 9.87 0.00
C01205C 107.17 1086.89 40.00 0.00

Node Results: (continued) ---

Node Demand Head Pressure Quality
ID GPM ft psi --
NODE_023 0.00 1100.64 88.84 0.00
C05400 97.47 1252.17 87.00 0.00
C01403C 7.99 1267.81 80.61 0.00
EFID_073 0.00 1288.47 87.28 0.00
C04901Ba 129.39 1459.22 57.41 0.00
C04901Bb_C04901C 450.30 1459.15 57.79 0.00
DV01104 222.87 1285.49 92.38 0.00
C03400 0.00 1382.88 26.60 0.00
E01000C 15.39 1100.47 62.30 0.00
C04901D 0.00 1461.26 40.01 0.00
C01205B 5.70 1275.26 89.30 0.00
C04901A 45.60 1461.25 40.10 0.00
C01205A 281.59 1277.29 79.65 0.00
C01205 0.00 1277.35 79.37 0.00
EFID_074 0.00 1267.85 40.00 0.00 EFID_075 0.00 1568.41 127.95 0.00
C01703A 124.27 1486.35 88.15 0.00
C01703B 139.09 1486.24 88.71 0.00
C01204 47.89 1281.49 60.89 0.00
E01000D 0.57 1100.47 61.95 0.00
C01702 8.56 1488.81 61.52 0.00
EFID_076 0.00 1489.12 58.05 0.00
C01203 30.79 1288.25 35.69 0.00
C05300 503.89 1338.18 40.00 0.00
EFID_077 0.00 1269.28 10.04 0.00
NODE_110 0.00 1291.99 23.39 0.00
C02600 96.05 1569.33 2.76 0.00
C01202 5.70 1290.59 24.98 0.00
C02100 750.98 1570.75 2.87 0.00
C02700 205.20 1569.06 2.14 0.00
C02200 0.00 1570.74 2.39 0.00
C02000 13.11 1570.83 1.54 0.00 C02300 103.45 1570.57 2.64 0.00

C02800 99.19 1568.89 3.02 0.00
C01403A 202.91 1465.95 40.09 0.00
C01403B 149.33 1466.01 40.01 0.00
C01900 5.70 1571.13 2.48 0.00
C03000 200.07 1568.67 3.67 0.00
C02900 80.93 1568.67 3.63 0.00
C03100 216.03 1568.66 3.71 0.00
EFID_078 0.00 1387.40 0.05 0.00
C02500 25.64 1569.69 2.44 0.00
C03200 0.00 1568.49 4.32 0.00
C01701 53.01 1495.31 30.00 0.00
C01800 2.86 1571.24 1.80 0.00
DV01103 165.87 1295.00 20.00 0.00
C03300 0.00 1568.31 4.41 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
C02400 10.83 1570.08 2.19 0.00
C05100 203.49 1564.53 8.60 0.00
EFID_079 0.00 1562.23 10.15 0.00
EFID_080 0.00 1562.19 10.64 0.00
C01700 0.00 1571.41 2.00 0.00
C01600 11.40 1571.42 2.03 0.00
EFID_081 0.00 1571.36 1.96 0.00
EFID_082 0.00 1295.86 86.24 0.00
EFID_083 0.00 1562.21 7.90 0.00
C05000 54.71 1564.77 11.17 0.00
EFID_084 0.00 1562.28 9.05 0.00
EFID_085 0.00 1562.29 9.05 0.00 C04800 28.50 1563.04 30.61 0.00
NODE_109 0.00 1476.15 104.20 0.00
C05200 85.50 1562.39 7.83 0.00
C01500 15.97 1571.47 1.82 0.00
C01201 49.01 1494.16 40.00 0.00
C04900 0.00 1565.73 7.24 0.00
C01400 0.00 1571.50 1.96 0.00
C04700 355.39 1565.93 6.61 0.00
C01401A 13.11 1571.45 1.94 0.00
EFID_086 0.00 1486.23 78.64 0.00
DV01102 68.40 1297.60 0.03 0.00
C04200 159.60 1567.68 5.25 0.00
C01401B 28.50 1571.45 1.95 0.00
EFID_099 0.00 1567.72 4.67 0.00
C04600 221.73 1566.16 6.03 0.00
EFID_087 0.00 1489.15 70.04 0.00
C04300 88.34 1567.43 5.59 0.00 C01300 45.60 1571.75 0.54 0.00
C04400 97.47 1567.20 5.40 0.00
C04500 47.31 1566.72 6.50 0.00
C01200 0.00 1572.20 0.91 0.00
DV01101 117.41 1503.91 40.00 0.00
DV01100_DV01000 0.00 1570.40 0.11 0.00
NODE_203 0.00 1573.33 -1.98 0.00
M05900B 237.69 1677.98 33.33 0.00
C01100_1 0.00 1573.79 -0.08 0.00
EFID_088 0.00 1573.80 0.03 0.00
C01000 34.77 1573.80 0.03 0.00
NODE_135 0.00 1572.35 0.54 0.00
M06200 0.00 1682.50 49.54 0.00
M06100 3.99 1682.93 47.74 0.00
M06000 1.13 1683.07 47.76 0.00
C01100_2 11.40 1682.51 48.43 0.00
NODE_005 0.00 1678.64 46.88 0.00 M05900A 6.27 1683.52 26.07 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
M05900 8.56 1683.52 26.07 0.00
M05800 2.29 1683.51 26.66 0.00
M04419 45.60 1680.48 67.21 0.00
M04418 7.41 1680.87 60.94 0.00
M04417 5.70 1681.02 59.05 0.00
NODE_004 0.00 1681.50 59.24 0.00
NODE_125 0.00 1683.45 31.61 0.00
M06200b 157.89 1661.83 47.59 0.00
M05700 5.13 1683.96 26.63 0.00 M04420 11.40 1681.46 60.16 0.00
M04421 8.56 1681.42 62.23 0.00
M04422 5.98 1681.41 61.35 0.00
M04415 11.97 1681.82 68.64 0.00
M04416 14.24 1681.81 68.58 0.00
M04423 1.99 1681.41 61.44 0.00
M05600 43.43 1684.66 27.13 0.00
M04414 10.27 1682.54 66.99 0.00
NODE_202 0.00 1682.84 66.95 0.00
M05500 5.70 1685.15 26.75 0.00
M05400 3.41 1685.16 26.83 0.00
M05300 3.41 1685.41 26.82 0.00
M04413 45.60 1683.08 62.67 0.00
M04412 5.70 1683.27 60.02 0.00
M04411 8.56 1683.27 59.79 0.00
M04410 62.70 1683.30 59.57 0.00
M04401 2.86 1686.49 37.93 0.00 M05200 17.10 1685.92 27.07 0.00
M04800 4.57 1686.25 26.33 0.00
M04408 75.23 1681.31 29.78 0.00
M04409 402.99 1681.30 29.61 0.00
M04406 1.71 1682.14 44.92 0.00
M04407 5.70 1681.71 37.26 0.00
M04900 49.01 1686.16 27.09 0.00
M05000 1.71 1686.15 27.15 0.00
M05100 2.86 1686.15 27.15 0.00
CP_WB_DS_2 0.00 1686.78 24.59 0.00
M04405 11.40 1682.85 52.98 0.00
M04700 5.70 1686.37 26.37 0.00
M04404 5.70 1683.60 51.92 0.00
NODE_002 0.00 1684.10 54.46 0.00
NODE_200 0.00 1686.98 21.42 0.00
M04600 10.83 1687.03 26.04 0.00
M04400 0.00 1690.27 27.50 0.00 M04500 2.86 1687.03 26.07 0.00
M04300 0.00 1687.03 26.10 0.00
M04200_1 0.00 1683.98 23.55 0.00
M04202 2.86 1683.98 23.55 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
M04201 11.40 1683.99 23.55 0.00
M04403 84.93 1684.79 29.36 0.00
M04200_2 0.00 1687.18 26.25 0.00
M04203 3.41 1679.41 22.14 0.00
M04100 21.09 1687.74 26.26 0.00
EFID_093 0.00 1687.34 26.35 0.00 M03900 53.01 1689.00 26.71 0.00
M03800 74.10 1689.16 26.84 0.00
M04000 3.41 1688.95 26.87 0.00
M04204 5.70 1664.56 16.61 0.00
M04205 5.70 1664.43 16.42 0.00
M04206 17.10 1664.20 16.39 0.00
M03700 39.90 1689.69 25.71 0.00
M04207 5.70 1660.47 16.93 0.00
M04209 45.03 1656.67 16.91 0.00
M04208 9.11 1657.29 14.82 0.00

M03600 86.63 1691.40 27.16 0.00
M04210 11.40 1655.46 23.79 0.00
M03500 55.87 1691.91 27.13 0.00
M04211 8.56 1652.11 32.58 0.00
M04212 2.86 1652.11 32.65 0.00
M03400 27.93 1692.45 27.05 0.00
M03300 18.81 1692.53 26.99 0.00 NODE_113 0.00 1652.11 32.29 0.00
M03200 20.51 1693.00 27.29 0.00
M03100 11.40 1693.17 27.26 0.00
M03000 26.21 1693.28 26.86 0.00
M04213 5.70 1647.96 20.23 0.00
NODE_114 0.00 1693.28 27.36 0.00
NODE_115 0.00 1647.96 25.49 0.00
M02900 41.61 1694.31 27.49 0.00
M02800 22.80 1694.68 27.67 0.00
M02700 49.01 1695.14 27.69 0.00
M04214 139.64 1638.87 33.80 0.00
M04216 12.53 1638.86 33.79 0.00
M04215 120.83 1637.08 17.76 0.00
M02600 14.81 1695.44 27.57 0.00
EFID_089 0.00 1576.89 40.00 0.00
NODE_022 0.00 1697.01 27.74 0.00
EFID_090 0.00 1562.04 37.22 0.00 M02300A_C 58.71 1698.06 27.59 0.00
M02400_M02500 156.19 1553.67 40.60 0.00
M02200 22.80 1698.52 27.50 0.00
M02100 49.31 1698.84 27.49 0.00
M02000A 64.19 1699.79 27.32 0.00
M02000B 209.77 1699.85 27.56 0.00
M01900 0.00 1700.70 28.01 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality
ID GPM ft psi --
M01800 30.21 1701.10 26.93 0.00
M01700A 1.71 1701.94 27.82 0.00
M01700B 1.71 1701.94 27.82 0.00 M01600 119.70 1703.50 28.48 0.00
M01500 82.09 1704.97 28.54 0.00
M01400 25.09 1705.72 28.79 0.00
M01300 3.41 1706.23 28.69 0.00
M01200 91.20 1707.48 28.89 0.00
MHID_POD_East 2901.02 1712.48 27.23 0.00
M01100_1 2.86 1716.31 29.14 0.00
MHID_POD 2901.02 1716.50 29.12 0.00
M01100_2 17.10 1718.07 24.72 0.00
EFID_091 0.00 1720.01 17.49 0.00
LHP_DS_2 0.00 560.02 15.00 0.00
LHP_US_2 0.00 822.52 128.74 0.00
LL_US_1 0.00 1039.51 131.94 0.00
LL_DS_1 0.00 792.70 25.00 0.00
CR_DS_1 0.00 1036.23 50.79 0.00
CR_US_1 0.00 1036.24 50.80 0.00
MC_WB_US 0.00 1682.47 47.09 0.00 MC_WB_DS 0.00 1573.80 0.00 0.00
CP_WB_US_2 0.00 1686.78 24.56 0.00
SR_WB_DS 0.00 1269.28 10.00 0.00
SR_WB_US 0.00 1553.72 133.25 0.00
EA_WB_US 0.00 1250.73 72.85 0.00
EA_WB_DS 0.00 1105.68 10.00 0.00
O_DS_2 0.00 1387.40 0.00 0.00
O_US_2 0.00 1566.48 77.60 0.00
CHL_DS_1 0.00 1094.20 25.00 0.00
CHL_US_1 0.00 1197.86 69.92 0.00
CHL_US_2 0.00 1562.40 185.02 0.00
GL_US_1 0.00 1545.72 74.54 0.00
GL_DS_1 0.00 1466.01 40.00 0.00
MCL_US_1 0.00 1070.27 74.73 0.00
DVP_US_1 0.00 1564.68 115.72 0.00

DVP_DS_1 0.00 1297.60 0.00 0.00
TL_DS 0.00 748.49 40.42 0.00 TL_US 0.00 748.50 40.43 0.00
KL_DS 0.00 766.31 40.00 0.00
KL_US 0.00 1016.29 148.31 0.00
PL_DS 0.00 830.06 47.00 0.00
PL_US 0.00 830.06 47.00 0.00
DSL_DS 0.00 759.91 40.00 0.00
DSL_US 0.00 1014.37 150.26 0.00
RRL_US 0.00 1048.95 132.39 0.00
RRL_DS 0.00 835.71 40.00 0.00
AL_US 0.00 1544.01 75.83 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
AL_DS 0.00 1461.31 40.00 0.00
NML_US 0.00 1367.38 179.16 0.00
NML_DS 0.00 1046.21 40.00 0.00
NFL_US 0.00 1214.45 110.38 0.00
NFL_DS 0.00 1017.40 25.00 0.00
O_US_3 0.00 1367.03 145.60 0.00
O_DS_3 0.00 1123.31 40.00 0.00
BL_US 0.00 1489.17 58.05 0.00
BL_DS 0.00 1489.17 58.05 0.00
WL_DS 0.00 1290.70 25.00 0.00
WL_US 0.00 1486.20 109.71 0.00
CHH_US 0.00 1090.58 91.81 0.00
CHH_DS 0.00 1090.57 91.80 0.00
SHH_US 0.00 1247.05 122.52 0.00
SHH_DS 0.00 1022.00 25.00 0.00
US_LRL 0.00 981.66 138.34 0.00
DS_LRL 0.00 754.71 40.00 0.00 US_SHP 0.00 827.80 135.41 0.00
DS_SHP 0.00 607.61 40.00 0.00
TFL_DS 0.00 657.51 40.00 0.00
TFL_US 0.00 832.98 116.03 0.00
TLL_US 0.00 1072.78 133.97 0.00
TLL_DS 0.00 855.91 40.00 0.00
DRL_DS 0.00 940.07 85.00 0.00
DRL_US 0.00 1122.59 164.09 0.00
O_DS_1 0.00 1244.10 25.00 0.00
O_US_1 0.00 1373.85 81.22 0.00
US_WCP 0.00 1021.08 116.33 0.00
US_TL2 0.00 1017.04 135.08 0.00
PL2_US 0.00 1023.59 102.86 0.00
US_CR2 0.00 1010.02 150.02 0.00
US_ML 0.00 1052.14 95.34 0.00
US_NML2 0.00 1035.98 97.61 0.00
US_NEML 0.00 901.60 93.12 0.00 DS_NEML 0.00 779.01 40.00 0.00
US_DRL2 0.00 911.59 92.29 0.00
DS_DRL3 0.00 868.91 40.00 0.00
US_DRL3 0.00 915.54 60.20 0.00
US_BL2 0.00 1566.32 60.76 0.00
US_GL3 0.00 1465.85 125.77 0.00
US_WLB3 0.00 1566.07 71.13 0.00
US_WBL4 0.00 1266.54 117.83 0.00
US_CH3 0.00 1562.74 65.45 0.00
US_BL3 0.00 1060.35 114.02 0.00
US_MBH1 0.00 1071.85 134.56 0.00
US_DV3 0.00 1252.00 78.99 0.00
US_CRLO 0.00 1047.79 73.87 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality ID GPM ft psi --

US_POL 0.00 1068.43 108.34 0.00
US_RA 0.00 1079.50 88.74 0.00
US_ACH 0.00 1077.68 92.94 0.00
US_FS 0.00 1669.95 80.31 0.00
US_CHL3 0.00 1258.43 106.52 0.00
US_SHP2 0.00 1470.37 95.96 0.00
US_CLP 0.00 1562.29 9.05 0.00
US_CLP2 0.00 1549.27 131.45 0.00
NODE_300 0.00 1025.30 110.01 0.00
E06614 51.30 814.73 35.00 0.00
US_LHP2 0.00 946.38 78.85 0.00
US_WCP4 0.00 980.33 50.06 0.00
NODE_330 0.00 1005.28 92.91 0.00
US_MC 0.00 1686.07 51.09 0.00 Reservoir_1 -30843.67 1722.70 0.00 0.00 Reservoir
Reservoir_2 -29000.00 1722.70 0.00 0.00 Reservoir

Link Results: --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Central_Lateral_Pipeline_000 39874.56 3.14 0.36 Open Central_Lateral_Pipeline_001a 39874.56 3.14 0.35 Open Central_Lateral_Pipeline_002 39301.12 3.10 0.34 Open Central_Lateral_Pipeline_003 38899.28 3.07 0.34 Open Central_Lateral_Pipeline_004 38883.31 3.06 0.34 Open Central_Lateral_Pipeline_005 38871.91 3.06 0.34 Open Central_Lateral_Pipeline_006 38546.98 3.04 0.33 Open Central_Lateral_Pipeline_007 38544.13 3.04 0.33 Open Central_Lateral_Pipeline_008 38538.43 3.04 0.33 Open Central_Lateral_Pipeline_009 38525.31 3.04 0.33 Open Central_Lateral_Pipeline_010 19699.30 3.49 0.69 Open Central_Lateral_Pipeline_011 19644.59 3.48 0.69 Open Central_Lateral_Pipeline_012 19441.10 8.82 6.64 Open Central_Lateral_Pipeline_015 34139.70 3.87 0.64 Open Central_Lateral_Pipeline_016 34025.42 3.86 0.64 Open Central_Lateral_Pipeline_017 33999.78 3.86 0.64 Open Central_Lateral_Pipeline_018 34036.25 3.86 0.64 Open Central_Lateral_Pipeline_019 33698.53 3.82 0.63 Open Central_Lateral_Pipeline_020 33903.73 3.85 0.64 Open Central_Lateral_Pipeline_021 33102.31 3.76 0.61 Open Central_Lateral_Pipeline_022 33102.31 3.76 0.61 Open Central_Lateral_Pipeline_023 33518.41 3.80 0.62 Open Central_Lateral_Pipeline_024 33318.34 3.78 0.60 Open Central_Lateral_Pipeline_025 33599.34 3.81 0.62 Open Central_Lateral_Pipeline_026 18517.73 8.40 6.06 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Central_Lateral_Pipeline_027 18851.72 8.56 6.32 Open Central_Lateral_Pipeline_028 18851.72 8.56 6.26 Open Central_Lateral_Pipeline_029a 18851.72 8.56 6.27 Open Central_Lateral_Pipeline_029b 18851.72 8.56 6.29 Open Central_Lateral_Pipeline_030 18851.72 8.56 6.26 Open Central_Lateral_Pipeline_031a 18754.25 8.51 6.21 Open Central_Lateral_Pipeline_031b 18754.25 8.51 6.10 Open Christopher_Pipeline_000b 849.89 0.60 0.08 Open Christopher_Pipeline_001 847.03 0.60 0.06 Open Christopher_Pipeline_002A 836.20 0.59 0.06 Open Christopher_Pipeline_002B 836.20 1.67 0.72 Open Christopher_Pipeline_002C 836.20 1.67 0.72 Open Christopher_Pipeline_003 833.34 1.66 0.72 Open Christopher_Pipeline_004 748.41 1.50 0.59 Open Christopher_Pipeline_005 502.73 2.26 2.03 Open Christopher_Pipeline_006 497.03 2.24 1.99 Open Christopher_Pipeline_007 485.63 2.18 1.91 Open Christopher_Pipeline_008 478.22 2.15 1.85 Open Christopher_Pipeline_009 483.92 2.18 1.89 Open Christopher_Pipeline_010 402.99 1.81 1.35 Open Christopher_Pipeline_011 245.68 1.72 1.59 Open Christopher_Pipeline_012 182.98 1.28 0.92 Open Christopher_Pipeline_013 174.43 0.78 0.29 Open Christopher_Pipeline_014 168.73 1.18 0.79 Open Christopher_Pipeline_015a 123.13 0.86 0.44 Open Christopher_Pipeline_015b 123.13 1.53 1.77 Open Christopher_Pipeline_016 112.86 1.40 1.51 Open Christopher_Pipeline_017 86.64 1.07 0.93 Open Christopher_Pipeline_018 100.89 1.25 1.22 Open Christopher_Pipeline_019 58.71 1.41 2.24 Open Christopher_Pipeline_020 53.01 1.27 1.85 Open Christopher_Pipeline_021 45.60 1.14 1.54 Open Christopher_Pipeline_022 27.93 0.67 0.56 Open Christopher_Pipeline_024 1.99 0.05 0.00 Open Christopher_Pipeline_025 7.97 0.19 0.06 Open Christopher_Pipeline_026 16.53 0.41 0.24 Open Highline_Canal_001 74.38 0.79 0.48 Open
Highline_Canal_002 85.78 0.91 0.63 Open
Highline_Canal_003 7883.23 6.03 4.45 Open
Highline_Canal_004 88.64 0.36 0.06 Open

Highline_Canal_005 162.74 0.66 0.19 Open
Highline_Canal_006 165.59 0.67 0.20 Open
Highline_Canal_007 168.45 0.68 0.21 Open
Highline_Canal_008 169.58 0.69 0.21 Open
Highline_Canal_009 170.15 0.69 0.21 Open
Highline_Canal_010 173.01 0.70 0.22 Open
Highline_Canal_011 279.59 1.13 0.53 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Highline_Canal_012 280.16 1.13 0.53 Open
Highline_Canal_013 1487.95 2.77 1.78 Open
Highline_Canal_014 1829.95 3.41 2.61 Open
Highline_Canal_015 1486.82 2.77 1.77 Open
Highline_Canal_016 728.75 2.10 1.36 Open
Highline_Canal_017 731.61 2.10 1.37 Open
Highline_Canal_018 1331.79 2.48 1.45 Open Highline_Canal_019a 1174.48 2.19 1.15 Open
Highline_Canal_020 782.91 2.25 1.55 Open
Ackerman_Hill_000 634.13 3.99 7.07 Open
Ackerman_Hill_001 638.41 4.01 7.15 Open
Ackerman_Hill_002 649.24 4.08 7.38 Open Ackerman_Hill_003 640.13 4.03 7.19 Open
Ackerman_Hill_004 651.53 4.10 7.43 Open
Ackerman_Hill_005 838.52 3.39 4.05 Open
Ackerman_Hill_006 1435.05 4.13 4.77 Open
Ackerman_Hill_007 971.06 3.93 5.31 Open
Ackerman_Hill_008 1029.49 4.16 5.92 Open
Ackerman_Hill_009 1248.38 3.59 3.68 Open
Ackerman_Hill_010 971.06 3.93 5.31 Open
Ackerman_Hill_011 855.62 3.59 4.59 Open
Ackerman_Hill_013 862.76 3.62 4.66 Open
Ackerman_Hill_014 2098.82 4.15 3.86 Open
Ackerman_Hill_016 58.73 1.41 2.24 Open
Ackerman_Hill_017 101.47 2.43 6.16 Open
Ackerman_Hill_018 151.92 3.50 11.85 Open
Ackerman_Hill_019 146.22 3.37 11.04 Open
Ackerman_Hill_020 143.08 3.43 11.64 Open Ackerman_Hill_021 634.13 3.99 7.07 Open
Ackerman_Hill_022 9.11 0.23 0.08 Open
Ackerman_Hill_023 41.63 1.04 1.30 Open
Ackerman_Hill_024 4.57 0.11 0.02 Open
Ackerman_Hill_025 148.81 3.56 12.52 Open
Ackerman_Hill_026 141.67 3.39 11.43 Open
Ackerman_Hill_027 5.70 0.14 0.02 Open
Ackerman_Hill_028 31.91 0.76 0.72 Open
Ackerman_Hill_029 35.90 0.86 0.90 Open
Ackerman_Hill_030 37.89 0.91 1.00 Open
Ackerman_Hill_031 42.46 1.02 1.23 Open
Ackerman_Hill_032 46.74 1.12 1.47 Open
Ackerman_Hill_033 50.73 1.21 1.71 Open
Ackerman_Hill_034 78.66 1.88 3.84 Open
Ackerman_Hill_035 78.66 1.88 3.84 Open
Ackerman_Hill_036 63.02 1.51 2.55 Open Ackerman_Hill_037 21.67 0.52 0.35 Open
Ackerman_Hill_038 21.67 0.52 0.35 Open
Ackerman_Hill_039 22.52 0.54 0.38 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Ackerman_Hill_040 3.71 0.09 0.01 Open
Ackerman_Hill_041 7.12 0.17 0.04 Open
Ackerman_Hill_042 8.56 0.20 0.06 Open
Ackerman_Hill_043 4.58 0.11 0.02 Open
Ackerman_Hill_044 3.15 0.08 0.01 Open

Ackerman_Hill_045 1.71 0.04 0.00 Open
Ackerman_Hill_046 4.57 0.11 0.02 Open Ackerman_Hill_047 479.36 3.01 4.21 Open
Ackerman_Hill_048 173.84 4.01 15.21 Open
Ackerman_Hill_049 1438.19 4.13 4.79 Open
Ackerman_Hill_050 41.35 0.99 1.17 Open
Ackerman_Hill_051 27.10 0.65 0.53 Open
Ackerman_Hill_052 17.10 0.43 0.25 Open
Ackerman_Hill_053 7.99 0.20 0.06 Open
Ackerman_Hill_054 10.27 0.26 0.10 Open
Ackerman_Hill_055 1.42 0.04 0.00 Open
Allison_Line_000 1029.41 4.16 5.92 Open
Allison_Line_001a 1000.91 4.62 7.74 Open
Allison_Line_002 579.69 3.65 5.98 Open
Allison_Line_003 450.30 4.80 13.56 Open Arens_Lateral_Line_000 6.27 0.14 0.00 Open
Arens_Lateral_Line_001 237.69 2.53 4.15 Open Bailey/Luse/Schultz_000 26.21 0.01 0.00 Open
Bailey_Line_000 59.86 1.49 2.55 Open
Bartlett_Loop_000 18.23 0.44 0.26 Open
Bartlett_Loop_007 80.36 1.85 3.64 Open
Bartlett_Loop_008 22.23 0.51 0.34 Open
Bartlett_Loop_009 58.13 1.34 2.00 Open
Bartlett_Loop_010 39.90 0.92 1.00 Open
Bartlett_Loop_011 39.90 0.92 1.00 Open
Bietler_Line_000 324.93 3.46 7.40 Open
Bietler_Line_001 324.93 3.74 8.91 Open
Bietler_Line_002a 271.91 2.90 5.33 Open
Bietler_Line_003 271.91 3.00 5.81 Open
Bietler_Line_004 263.36 3.03 6.04 Open
Bietler_Line_005 139.09 3.46 12.15 Open
Bowcut_Pipeline_000 290.12 3.09 6.01 Open Bowcut_Pipeline_001 301.52 3.21 6.45 Open
Bowcut_Pipeline_002 355.66 3.79 8.76 Open Bowcut_Pipeline_003 346.54 3.69 8.35 Open
Bowcut_Pipeline_004 361.36 3.85 9.02 Open Bowcut_Pipeline_005 378.46 4.03 9.83 Open
Bowcut_Pipeline_006 384.16 4.10 10.11 Open Bowcut_Pipeline_007 389.86 4.16 10.38 Open
Bowcut_Pipeline_008 393.27 4.19 10.55 Open Bowcut_Pipeline_009 407.53 4.34 11.27 Open
Bowcut_Pipeline_010 396.13 4.22 10.99 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Bowcut_Pipeline_011 0.00 0.00 0.00 Open Bowcut_Pipeline_012 11.41 0.26 0.10 Open
Bowcut_Pipeline_013 8.56 0.20 0.07 Open Bowcut_Pipeline_014 120.83 2.78 7.75 Open
Bowcut_Pipeline_015 133.36 3.19 10.24 Open Bowcut_Pipeline_016 273.00 3.02 5.86 Open
Bowcut_Pipeline_017 5.70 0.13 0.03 Open Bowcut_Pipeline_018 278.70 2.97 5.58 Open
Buckley_Line_000 120.83 3.18 10.71 Open
Buckley_Line_001 103.73 2.39 5.85 Open
Cameron_Hill_000 388.74 4.47 12.42 Open
Cameron_Hill_001a 388.74 4.30 11.27 Open
Cameron_Hill_003 506.16 3.44 5.63 Open Central_Lateral_Pipeline_013 503.89 3.17 4.62 Open
Central_Lateral_Pipeline_014 503.89 4.25 9.43 Open Central_Lateral_Pipeline_032 0.57 0.01 0.00 Open Central_Lateral_Pipeline_033 15.96 0.38 0.20 Open Central_Lateral_Pipeline_044 37774.34 2.98 0.32 Open Central_Lateral_Pipeline_045 21698.57 3.85 0.82 Open
Central_Lateral_Pipeline_046 21305.84 3.78 0.80 Open Central_Lateral_Pipeline_047 21698.57 3.85 0.82 Open Central_Lateral_Pipeline_048 21353.15 3.79 0.80 Open
Central_Lateral_Pipeline_049 21450.63 3.80 0.81 Open Central_Lateral_Pipeline_050 21538.97 3.82 0.81 Open Central_Lateral_Pipeline_051 21084.11 3.74 0.78 Open
Central_Lateral_Pipeline_052 20728.72 3.68 0.76 Open Central_Lateral_Pipeline_053 19355.60 8.79 6.58 Open Central_Lateral_Pipeline_054 18533.68 8.41 6.07 Open
Chamberlin_Pressure_Line_000 955.31 4.01 5.63 Open Chamberlin_Pressure_Line_001 1126.62 4.56 6.99 Open Chamberlin_Pressure_Line_002 982.69 3.97 5.43 Open
Chamberlin_Pressure_Line_003 1011.19 4.09 5.72 Open Chamberlin_Pressure_Line_004 507.30 3.45 5.66 Open Chamberlin_Pressure_Line_005 421.23 4.84 14.41 Open
Chamberlin_Pressure_Line_006 289.56 3.33 7.20 Open Chamberlin_Pressure_Line_007 289.56 3.33 7.20 Open Chamberlin_Pressure_Line_008 83.23 2.07 4.70 Open
Chamberlin_Pressure_Line_009 83.23 2.07 4.69 Open Chamberlin_Pressure_Line_010 67.83 1.56 2.66 Open Chamberlin_Pressure_Line_011 67.83 1.56 2.66 Open Chamberlin_Pressure_Line_012 105.74 2.44 6.06 Open Chamberlin_Pressure_Line_013 711.93 4.64 9.53 Open
Chamberlin_Pressure_Line_014 683.43 4.45 8.84 Open Chamberlin_Pressure_Line_015 657.21

4.28 8.22 Open Chamberlin_Pressure_Line_016 515.29 3.50 5.82 Open Chamberlin_Pressure_Line_017 515.29 3.36 5.24 Open Chamberlin_Pressure_Line_018 80.37 2.00 4.40 Open

Link Results: (continued) ---

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Chamberlin_Pressure_Line_019 7.99 0.20 0.06 Open Chamberlin_Pressure_Line_020 360.80 3.85 8.99 Open Chamberlin_Pressure_Line_021 2171.45 3.96 3.39 Open Chamberlin_Pressure_Line_023 1691.49 4.86 6.46 Open Chamberlin_Pressure_Line_024 1955.98 4.66 5.36 Open Chamberlin_Pressure_Line_025 2893.37 4.51 3.94 Open Chamberlin_Pressure_Line_026 2590.97 4.04 3.21 Open Chamberlin_Pressure_Line_027 2239.27 4.42 4.36 Open Chamberlin_Pressure_Line_028 2452.46 4.84 5.16 Open Chamberlin_Pressure_Line_029 160.17 3.69 13.07 Open Chamberlin_Pressure_Line_030 200.63 4.62 19.84 Open Chamberlin_Pressure_Line_031 1585.76 4.56 5.74 Open Chamberlin_Pressure_Line_032 1487.42 4.28 5.09 Open Chamberlin_Pressure_Line_033 210.32 3.52 9.93 Open Chamberlin_Pressure_Line_034 243.39 2.69 4.74 Open Chamberlin_Pressure_Line_035 2.86 0.07 0.01 Open Chamberlin_Pressure_Line_036 5737.77 4.83 3.11 Open Chamberlin_Pressure_Line_037 5737.77 4.29 2.33 Open Chamberlin_Road_Line_Overflow_000 278.72 3.21 6.71 Open Chamberlin_Road_Line_Overflow_001 165.30 3.96 15.21 Open Chamberlin_Road_Line_Overflow_001b 53.01 1.27 1.85 Open Chamberlin_Road_Line_Overflow_002 277.59 3.19 6.66 Open Cherry_Hill_Line_000 147.63 3.88 15.52 Open Cherry_Hill_Line_001 147.63 3.40 11.24 Open Cherry_Hill_Line_002a 147.63 3.68 13.57 Open Chipping_Line_000 134.51 3.10 9.46 Open
Chipping_Line_002a 3634.63 3.63 2.03 Open
Chipping_Line_003 3634.63 4.32 3.11 Open
Chipping_Line_004 3500.12 4.09 2.77 Open
Chipping_Line_005 3397.52 4.90 4.38 Open
Chipping_Line_009 1263.70 3.76 4.11 Open
Chipping_Line_010a 882.93 3.87 5.40 Open
Chipping_Line_010b 882.93 3.57 12.21 Open
Chipping_Line_011 1724.83 4.26 4.63 Open Chipping_Line_012 1948.84 4.65 5.33 Open
Chipping_Line_014 1991.03 4.75 5.54 Open
Chipping_Line_015 560.89 3.53 5.63 Open
Chipping_Line_016 456.57 4.87 13.91 Open
Chipping_Line_017 361.96 4.16 10.88 Open
Chipping_Line_018 334.59 3.85 9.41 Open
Chipping_Line_019 322.04 3.43 7.29 Open
Chipping_Line_020 242.24 2.58 4.30 Open
Chipping_Line_021 3327.68 4.80 4.22 Open
Chipping_Line_022 3133.88 4.52 3.77 Open
Chipping_Line_023 2882.51 4.16 3.23 Open
Chipping_Line_024 889.77 3.60 4.52 Open
Chipping_Line_024b 2880.80 4.15 3.23 Open

Link Results: (continued) -- Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Crag_Rat_Line_000 1050.49 4.41 6.71 Open
Crag_Rat_Line_001 472.50 3.21 4.94 Open
Crag_Rat_Line_002a 725.59 4.93 10.98 Open
Crag_Rat_Line_002b 725.59 4.93 10.98 Open
Crag_Rat_Line_003 293.53 4.19 12.49 Open
Crag_Rat_Line_004 178.97 4.71 22.17 Open
Crag_Rat_Line_006 53.01 1.27 1.85 Open
Crag_Rat_Line_007 259.90 2.77 4.90 Open
Crag_Rat_Line_008 62.69 1.44 2.30 Open
Crag_Rat_Line_009 25.64 0.59 0.44 Open
Crag_Rat_Line_010 125.96 3.14 10.11 Open
Crag_Rat_Line_011 23.93 0.60 0.47 Open
Crag_Rat_Line_012 33.63 0.78 0.74 Open Crag_Rat_Line_013 5.70 0.13 0.03 Open Dethman/Swyers_Line_000a 826.79 4.48 8.05 Open Dethman/Swyers_Line_003 397.01 4.23 10.74 Open Dethman/Swyers_Line_008 429.79 4.58 12.44 Open Dethman/Swyers_Line_011 93.49 2.15 4.82 Open Dethman_Ridge_Line_000 8801.12 4.57 2.13 Open Dethman_Ridge_Line_001a 8301.80 4.66

2.31 Open Dethman_Ridge_Line_002 8556.02 4.45 2.02 Open Dethman_Ridge_Line_003 8283.57 4.65 2.31 Open Dethman_Ridge_Line_004 8260.20 4.64 2.29 Open Dethman_Ridge_Line_005 8232.83 4.62 2.27 Open Dethman_Ridge_Line_006 8232.83 4.62 2.27 Open Dethman_Ridge_Line_007 8069.25 4.53 2.19 Open Dethman_Ridge_Line_008 8009.39 4.78 2.50 Open Dethman_Ridge_Line_009 7825.27 4.67 2.39 Open Dethman_Ridge_Line_010 7813.87 4.66 2.39 Open Dethman_Ridge_Line_011 6790.71 4.70 2.64 Open Dethman_Ridge_Line_012 6790.71 4.70 2.64 Open Dethman_Ridge_Line_013 6611.15 4.57 2.51 Open Dethman_Ridge_Line_014 5952.49 4.83 3.05 Open Dethman_Ridge_Line_015 5952.49 4.83 3.05 Open Dethman_Ridge_Line_016 5768.96 4.68 2.88 Open Dethman_Ridge_Line_017 5625.33 4.73 3.00 Open Dethman_Ridge_Line_018 5454.33 4.59 2.83 Open Dethman_Ridge_Line_019 5309.84 4.31 2.47 Open Dethman_Ridge_Line_020 2061.67 4.92 5.91 Open Dethman_Ridge_Line_021 1842.79 4.39 4.80 Open Dethman_Ridge_Line_022 1757.29 4.19 4.40 Open Dethman_Ridge_Line_023 1474.57 4.24 5.01 Open Dethman_Ridge_Line_024 1389.64 4.14 4.90 Open Dethman_Ridge_Line_025 1283.06 3.82 4.22 Open Dethman_Ridge_Line_027 129.97 3.11 9.75 Open Dethman_Ridge_Line_028 48.44 1.16 1.56 Open Dethman_Ridge_Line_029 48.44 1.16 1.57 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Dethman_Ridge_Line_030 245.38 2.89 5.61 Open Dethman_Ridge_Line_031 85.78 1.98 4.11 Open Dethman_Ridge_Line_032 25.64 0.59 0.44 Open Dethman_Ridge_Line_034 375.93 4.01 9.71 Open Dethman_Ridge_Line_035 210.34 4.85 21.65 Open Dethman_Ridge_Line_036 369.36 4.08 10.25 Open Dethman_Ridge_Line_037 165.59 3.82 12.21 Open Dethman_Ridge_Line_038 165.59 3.82 13.91 Open Dethman_Ridge_Line_039 53.01 1.22 1.69 Open Dethman_Ridge_Line_042 47.59 1.10 1.38 Open Dethman_Ridge_Line_043 190.94 4.57 19.87 Open Dethman_Ridge_Line_044 828.21 3.35 3.95 Open Dethman_Ridge_Line_045 715.64 4.66 9.63 Open Dethman_Ridge_Line_046 715.64 4.50 8.84 Open Dethman_Ridge_Line_047 603.63 4.11 7.81 Open Dethman_Ridge_Line_048 418.94 4.82 14.26 Open Dethman_Ridge_Line_049 4933.90 4.00 2.15 Open Dethman_Ridge_Line_050 4825.32 3.91 2.07 Open Dethman_Ridge_Line_051 4447.13 3.61 1.78 Open Dethman_Ridge_Line_052 2140.08 4.05 3.60 Open Dethman_Ridge_Line_053 1744.49 4.16 4.34 Open Dethman_Ridge_Line_054 2385.46 4.35 4.04 Open Dethman_Ridge_Line_055 913.70 3.83 5.18 Open Dethman_Ridge_Line_056 913.70 4.00 5.75 Open Dethman_Ridge_Line_057 597.37 4.06 7.66 Open Dethman_Ridge_Line_058 909.71 3.98 5.71 Open Dethman_Ridge_Line_059 598.50 4.07 7.68 Open Dethman_Ridge_Line_060 320.91 3.55 7.90 Open Dethman_Ridge_Line_061 1739.36 4.30 4.70 Open Dethman_Ridge_Line_062 116.29 2.68 7.22 Open Dethman_Ridge_Line_063 2.86 0.07 0.01 Open Dethman_Ridge_Line_064 91.20 2.10 4.60 Open Dukes_Valley_Canal_000 10800.46 4.93 2.27 Open Dukes_Valley_Canal_001 9511.71 4.71 2.18 Open Dukes_Valley_Canal_002 9432.49 4.67 2.15 Open Dukes_Valley_Canal_003 9413.10 4.66 2.14 Open Dukes_Valley_Canal_004 9398.29 4.65 2.13 Open Dukes_Valley_Canal_005 9392.58 4.65 2.13 Open Dukes_Valley_Canal_006 9134.93 4.52 2.02 Open Dukes_Valley_Canal_007 8987.30 4.45 1.96 Open Dukes_Valley_Canal_008 9253.50 4.58 2.07 Open Dukes_Valley_Canal_009 8023.44 4.51 2.16 Open Dukes_Valley_Canal_010 8983.89 4.45 1.96 Open Dukes_Valley_Canal_011 8951.97 4.43 1.95 Open Dukes_Valley_Canal_012 8796.94 4.94 2.57 Open Dukes_Valley_Canal_013 8711.44 4.89 2.52 Open Dukes_Valley_Canal_014 8090.42 4.54 2.20 Open

Link Results: (continued) --- Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Dukes_Valley_Canal_015 8006.34 4.50 2.16 Open Dukes_Valley_Canal_016 8006.34 4.50 2.16 Open Dukes_Valley_Canal_017 7929.96 4.45 2.12 Open Dukes_Valley_Canal_018 7883.23 4.43 2.10 Open Dukes_Valley_Canal_019 10225.90 4.47 1.84 Open Dukes_Valley_Canal_020 10225.90 4.47 1.84 Open Dukes_Valley_Canal_021 10162.07 4.44 1.82 Open Dukes_Valley_Canal_022 9581.83 4.74 2.21 Open Dukes_Valley_Canal_023 10048.07 4.97 2.41 Open Dukes_Valley_Canal_024 9656.50 4.78 2.24 Open Dukes_Valley_Canal_025 9893.04 4.90 2.34 Open Dukes_Valley_Canal_026 9809.83 4.85 2.31 Open Dukes_Valley_Pipeline_000a 10294.30 4.57 1.93 Open Dukes_Valley_Pipeline_000b 10294.30 4.70 1.74 Open Dukes_Valley_Pipeline_001 10225.90 4.47 1.84 Open Dukes_Valley_Pipeline_002 10800.46 4.93 2.27 Open Dunphin/Castaneda_Line_000 254.21 2.71 4.70 Open Eastside_Auxillary_000 220.56 2.35 3.62 Open Eastside_Auxillary_001 220.56 2.54 4.35 Open Eastside_Auxillary_002 218.00 2.51 4.25 Open Eastside_Auxillary_003 214.86 3.60 10.33 Open Eastside_Auxillary_003b 180.66 4.33 17.93 Open Eastside_Auxillary_004 162.99 3.90 14.82 Open Eastside_Auxillary_005 161.86 3.88 14.63 Open Eastside_Auxillary_006 160.73 3.85 14.44

Open Eastside_Auxillary_007 145.91 3.49 12.07 Open Eastside_Auxillary_008 142.50 3.41 11.56 Open Eastside_Canal_000 18517.73 4.77 1.52 Open Eastside_Canal_000_1 18517.73 4.77 1.52 Open Eastside_Canal_002 18514.87 4.77 1.52 Open
Eastside_Canal_003 18433.36 4.75 1.51 Open
Eastside_Canal_006 18446.47 4.75 1.51 Open
Eastside_Canal_007 18370.66 4.73 1.50 Open
Eastside_Canal_008 18326.77 4.72 1.50 Open
Eastside_Canal_009 18310.80 4.71 1.49 Open
Eastside_Canal_010 18184.27 4.99 1.72 Open
Eastside_Canal_011 18182.56 4.99 1.72 Open
Eastside_Canal_012 18152.93 4.98 1.72 Open
Eastside_Canal_013 18061.73 4.96 1.70 Open
Eastside_Canal_014 17937.46 4.92 1.68 Open
Eastside_Canal_015 17937.46 4.92 1.68 Open
Eastside_Canal_016 4026.91 3.53 6.10 Open
Eastside_Canal_017 4026.91 3.53 1.79 Open Eastside_Canal_018 3898.09 4.93 4.10 Open
Eastside_Canal_019 3760.16 4.55 3.45 Open
Eastside_Canal_020 7843.62 4.84 2.61 Open
Eastside_Canal_021 7765.53 4.80 2.57 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Eastside_Canal_022 7479.40 4.62 2.39 Open
Eastside_Canal_023 7362.27 4.55 2.33 Open
Eastside_Canal_025 7181.00 4.43 2.21 Open
Eastside_Canal_026 15654.32 4.30 1.31 Open
Eastside_Canal_027 15591.62 4.28 1.30 Open
Eastside_Canal_028 15449.69 4.24 1.27 Open Eastside_Canal_029 14913.32 4.09 1.19 Open
Eastside_Canal_030 14539.41 3.99 0.00 Open
Eastside_Canal_031 14887.68 4.09 1.19 Open
Eastside_Canal_032 14472.15 3.97 1.13 Open
Eastside_Canal_033 14187.72 3.89 1.09 Open
Eastside_Canal_034 14176.32 3.89 1.09 Open
Eastside_Canal_035 6057.81 4.53 2.58 Open
Eastside_Canal_036 5571.02 4.89 3.26 Open
Eastside_Canal_037 5488.94 4.81 3.17 Open
Eastside_Canal_038 4516.81 3.96 2.21 Open
Eastside_Canal_039 4169.68 3.66 1.91 Open
Eastside_Canal_041 2898.89 4.52 3.96 Open
Eastside_Canal_042 17931.76 4.92 1.68 Open
Eastside_Canal_043 17507.11 4.81 1.61 Open
Eastside_Canal_044 17513.94 4.81 1.61 Open
Eastside_Canal_045 17507.11 4.81 1.61 Open Eastside_Canal_046 17450.69 4.79 1.60 Open
Eastside_Canal_047 17484.88 4.80 1.60 Open
Eastside_Canal_048 17494.00 4.80 1.60 Open
Eastside_Canal_049 13125.83 4.91 2.00 Open
Eastside_Canal_050 13037.20 4.87 1.97 Open
Eastside_Canal_051 13048.60 4.88 1.97 Open
Eastside_Canal_052 13031.50 4.87 1.97 Open
Eastside_Canal_053 12869.04 4.81 1.93 Open
Eastside_Canal_054 12667.25 4.73 1.87 Open
Eastside_Canal_055 12343.21 4.61 12.21 Open
Eastside_Canal_056 12561.24 4.69 1.84 Open
Eastside_Canal_057 12343.21 4.61 1.78 Open
Ehrentraut_000 5.70 0.14 0.03 Open
Fisher_Line_000 156.19 3.99 16.00 Open
Fisher_Line_001 156.19 3.60 12.47 Open
Fisher_Line_002 156.19 3.60 12.47 Open Gilkerson_Line_000 401.84 4.28 10.98 Open
Gilkerson_Line_001 210.90 4.86 21.74 Open
Gilkerson_Line_002 7.99 0.22 0.08 Open
Gilkerson_Line_003 373.34 3.98 9.69 Open Gilkerson_Line_004a 360.23 4.37 12.31 Open
Gilkerson_Line_004b 360.23 3.84 8.99 Open Gilkerson_Line_005 7.99 0.20 0.06 Open
Highline_Canal_000 88.64 2.04 4.37 Open
Hukari_Line_000 203.49 3.64 10.97 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Hukari_Line_002 102.60 2.56 6.92 Open Hukari_Line_003 100.89 2.42 6.10 Open
Kellly_Line_000a 142.78 3.10 9.11 Open
Kellly_Line_001 142.78 3.42 11.60 Open
Kennedy_Line_000 242.24 2.68 4.69 Open
Lariza_Line_000a 414.39 4.42 11.62 Open
Lariza_Line_001 5.70 0.13 0.04 Open
Lenz_Butte_Line_000 1023.17 4.14 5.85 Open Lenz_Butte_Line_001 1023.17 4.14 5.85 Open
Lenz_Butte_Line_002 1023.17 4.14 5.85 Open Lenz_Butte_Line_003 971.87 3.93 5.32 Open
Lenz_Butte_Line_004 1023.17 4.14 5.85 Open Lenz_Butte_Line_005 917.71 3.71 4.78 Open
Lenz_Butte_Line_006 363.38 4.02 9.95 Open Lenz_Butte_Line_007 5.70 0.13 0.03 Open
Lenz_Butte_Line_008 5.70 0.13 0.03 Open Lenz_Butte_Line_010 424.38 4.52 12.15 Open
Lenz_Butte_Line_011 424.38 4.52 12.15 Open Lenz_Butte_Line_012 374.21 3.99 9.62 Open
Lenz_Butte_Line_013 5.13 0.12 0.02 Open Lenz_Butte_Line_014 10.83 0.25 0.09 Open
Loop_Line_000 10.55 0.24 0.08 Open
Loop_Line_001 112.01 2.68 7.40 Open
Loop_Line_001a 2758.52 3.98 2.98 Open
Loop_Line_002 36.49 0.91 1.02 Open
Loop_Line_003 197.79 4.93 23.33 Open
Loop_Line_004 197.21 4.91 23.20 Open
Loop_Line_005 98.03 2.44 6.36 Open
Loop_Line_006 540.92 3.52 5.73 Open
Loop_Line_007 144.76 3.47 11.89 Open
Loop_Line_008 144.76 3.61 13.09 Open
Loop_Line_009 1.13 0.03 0.00 Open
Loop_Line_010 234.27 2.69 4.86 Open Loop_Line_011 1352.88 4.03 4.66 Open
Loop_Line_012 1352.88 4.03 4.66 Open
Loop_Line_013 1251.99 3.73 4.04 Open
Loop_Line_014 1095.81 4.60 7.25 Open
Loop_Line_015 985.22 4.13 5.96 Open
Loop_Line_016 984.09 4.13 5.94 Open
Loop_Line_017 443.18 4.42 11.19 Open
Loop_Line_020 2634.83 4.81 4.86 Open
Loop_Line_021 4499.58 3.95 2.20 Open
Loop_Line_022 4243.64 3.72 1.97 Open
Loop_Line_023 3437.95 4.34 3.25 Open
Loop_Line_024a 2767.64 4.33 3.66 Open
Loop_Line_024b 2767.64 3.99 2.99 Open
Loop_Line_025 4445.43 3.90 2.15 Open

Link Results: (continued) --
------- Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Loop_Line_026 869.26 3.52 4.33 Open
Loop_Line_027 117.14 2.70 7.32 Open
Loop_Line_028 117.14 2.70 7.32 Open
Loop_Line_029 2447.86 4.63 4.62 Open
Loop_Line_030 1094.98 4.59 7.24 Open
Loop_Line_035 113.72 2.72 7.61 Open
Loop_Line_036 9.11 0.21 0.06 Open
Loop_Line_038 2624.29 4.96 5.25 Open Lower_Highline_Pressure_001 601.33 3.78 6.40 Open
Lower_Highline_Pressure_003 388.72 4.14 10.33 Open Lower_Highline_Pressure_005 601.33 3.78 6.40 Open Lower_Highline_Pressure_006 204.34 4.71 20.52 Open
Lower_Highline_Pressure_007 145.64 3.36 10.96 Open Lower_Highline_Pressure_008 140.79 3.24 10.29 Open Lower_Highline_Pressure_009 200.35 4.62 19.80 Open
Lower_Highline_Pressure_014 133.37 3.07 9.31 Open Lower_Highline_Pressure_015 127.67 2.94 8.58 Open Lower_Highline_Pressure_016 24.23 0.58 0.43 Open Lower_Highline_Pressure_017 53.00 1.32 2.04 Open Lower_Highline_Pressure_018 50.44 1.16 1.54 Open
Lower_Highline_Pressure_019 41.32 1.03 1.28 Open Lower_Highline_Pressure_020a 367.35 4.06 10.15 Open Lower_Highline_Pressure_021 343.42 3.79 8.96 Open Lower_Highline_Pressure_024 9.69 0.23 0.08 Open Lower_Highline_Pressure_025 9.69 0.24 0.09 Open
Lower_Highline_Pressure_027 232.84 2.68 4.81 Open Lower_Highline_Pressure_028a 216.02

3.78 11.65 Open Main_Canal_000 30843.67 4.80 1.15 Open
Main_Canal_001 30843.67 4.80 1.15 Open
Main_Canal_002 30826.57 4.80 1.15 Open
Main_Canal_003 27925.55 4.35 0.96 Open
Main_Canal_004 27922.70 4.35 0.96 Open
Main_Canal_005 25021.68 3.90 0.78 Open
Main_Canal_006 24930.48 4.92 1.38 Open
Main_Canal_007 24927.06 4.91 1.38 Open
Main_Canal_008 24901.98 4.91 1.38 Open
Main_Canal_009 24819.89 4.89 1.37 Open
Main_Canal_010 24700.19 4.87 1.36 Open
Main_Canal_011 24456.78 4.82 1.33 Open
Main_Canal_012 24392.59 4.81 1.33 Open
Main_Canal_013 24698.48 4.87 0.00 Open
Main_Canal_014 24696.76 4.87 1.36 Open Main_Canal_015 24666.55 4.86 1.35 Open
Main_Canal_016 24666.55 4.86 1.35 Open
Main_Canal_017 24343.29 4.80 1.32 Open
Main_Canal_018 24320.49 4.80 1.32 Open
Main_Canal_019 24261.77 4.78 1.31 Open

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Main_Canal_021 22281.04 4.39 1.12 Open
Main_Canal_022 22218.90 4.38 0.00 Open
Main_Canal_023 22217.18 4.38 1.12 Open
Main_Canal_024 22221.75 4.38 1.10 Open
Main_Canal_025 22275.34 4.39 1.12 Open Main_Canal_026 22270.77 4.39 1.12 Open
Main_Canal_027 22200.08 4.38 1.11 Open
Main_Canal_028 22196.67 4.38 1.11 Open
Main_Canal_029 22193.25 4.38 1.11 Open
Main_Canal_030 22187.55 4.37 1.11 Open
Main_Canal_031 22144.12 4.37 1.11 Open
Main_Canal_032 22139.00 4.37 1.11 Open
Main_Canal_033 21884.20 4.31 1.08 Open
Main_Canal_034 21883.07 4.31 1.08 Open
Main_Canal_036 21879.08 4.31 1.08 Open
Main_Canal_037a 50709.79 4.76 0.84 Open
Main_Canal_037b 50709.79 4.76 0.00 Open Dukes_Valley_Pipeline_002a 10800.46 4.93 6.10 Open Main_Canal_039 23130.92 4.56 1.20 Open
Main_Canal_041 23951.13 4.72 1.28 Open
Main_Canal_042 23939.73 4.72 1.28 Open Main_Canal_043 23919.21 4.72 1.28 Open
Main_Canal_044 23900.40 4.71 1.28 Open
Main_Canal_045 23872.47 4.71 1.27 Open
Main_Canal_046 23559.54 4.65 1.24 Open
Main_Canal_047 23816.60 4.70 1.27 Open
Main_Canal_048 23690.07 4.67 1.26 Open
Main_Canal_049 23729.97 4.68 1.26 Open
Main_Canal_050 23615.97 4.66 1.25 Open
Main_Canal_051 23562.96 4.65 1.24 Open
Main_Canal_052 23538.46 4.64 1.24 Open
Main_Canal_053 23538.46 4.64 1.24 Open
Main_Canal_054 24105.59 4.75 1.30 Open
Main_Canal_055 24090.77 4.75 1.30 Open
Main_Canal_056 24041.76 4.74 1.29 Open
Main_Canal_057 24018.96 4.74 1.29 Open
Main_Canal_058 23977.34 4.73 1.28 Open Main_Canal_Tavern_Chute_000 21886.48 4.32 1.09 Open Main_Canal_Tavern_Chute_001 21884.20 4.31 1.08 Open Marsh/Chamberlin_Line_000 5235.57 4.59 2.90 Open Marsh/Chamberlin_Line_001 5229.87 4.59 2.90 Open Marsh/Chamberlin_Line_002a 6053.27 4.91 3.15 Open Marsh/Chamberlin_Line_003 5737.77 4.83 3.11 Open Marsh/Chamberlin_Line_004 3113.95 4.86 4.52 Open Marsh/Chamberlin_Line_005 2980.00 4.65 4.16 Open Marsh/Chamberlin_Line_006 2974.30 4.64 4.15 Open Marsh/Chamberlin_Line_007a 2893.37 4.51 3.94 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Marsh/Chamberlin_Line_008 5737.77 4.29 2.33 Open Marsh/Chamberlin_Line_009 5737.77 4.29 2.33 Open Marsh/Chamberlin_Line_011 5224.17 4.58 2.90 Open Marsh/Chamberlin_Line_012 5212.77 4.57 2.89 Open Marsh/Chamberlin_Line_013 0.00 0.00 0.00 Open Marsh/Chamberlin_Line_014 5737.77 4.29 2.33 Open Mathieson_Line_000 67.26 1.77 3.62 Open
Mathieson_Line_001 3.99 0.09 0.02 Open
Mathieson_Line_002 9.69 0.22 0.07 Open Mobile_Home_Line_000 145.34 2.89 7.64 Open
Mobile_Home_Line_001 77.51 1.79 3.41 Open Mobile_Home_Line_002 77.51 1.79 3.41 Open
Mobile_Home_Line_003 25.64 0.59 0.44 Open Mud_Alley_Line_000 28.50 0.71 0.64 Open
Mud_Alley_Line_001 4.57 0.11 0.02 Open
Mud_Alley_Line_002 52.73 1.31 2.02 Open
Nafsinger_Line_000 31.36 0.72 0.64 Open
Nafsinger_Line_001 11.40 0.26 0.10 Open
Nafsinger_Line_002 17.10 0.39 0.21 Open
Nafsinger_Line_003 22.80 0.53 0.35 Open
Nafsinger_Line_004 31.36 0.72 0.63 Open
Nafsinger_Line_005 127.13 3.62 14.21 Open
Nafsinger_Line_006 31.36 0.78 0.77 Open Neal_Creek_Lateral_000 157.89 3.78 13.97 Open
Neal_Creek_Lateral_001 157.89 3.78 13.97 Open Neal_Mill_Line_000 250.23 2.67 4.57 Open
Neal_Mill_Line_001 14.24 0.33 0.15 Open
Neal_Mill_Line_002 658.66 4.59 9.71 Open
Neal_Mill_Line_003 392.18 4.18 10.50 Open
Neal_Mill_Line_004 142.50 3.28 10.53 Open Neal_Mill_Line_005 144.79 3.34 10.84 Open
Neal_Mill_Line_006 389.33 4.15 10.36 Open
Neal_Mill_Line_007 166.46 3.84 14.03 Open
Neal_Mill_Line_008 21.67 0.50 0.32 Open
Neal_Mill_Line_009 16.25 0.37 0.19 Open
Neal_Mill_Line_010 642.41 4.04 7.24 Open
Neufeldt_Line_000a 271.89 3.30 7.31 Open
Neufeldt_Line_001 271.89 3.13 6.40 Open
Nunamaker_Line_000 909.16 3.81 5.13 Open Nunamaker_Line_001a 738.16 4.00 6.52 Open
Nunamaker_Line_002 600.23 3.91 6.95 Open
Nunamaker_Line_003 600.23 3.77 6.38 Open
Nunamaker_Line_004 600.23 3.91 6.95 Open
Nunamaker_Line_005 491.36 3.34 5.33 Open
Nunamaker_Line_006 435.49 4.44 11.43 Open
Nunamaker_Line_007 369.37 3.94 9.39 Open Nunamaker_Line_008 369.37 3.94 9.39 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Nunamaker_Line_009 369.37 3.94 9.39 Open
Nunamaker_Line_010 233.14 2.49 4.01 Open
Nunamaker_Line_011 233.14 2.49 4.01 Open
Nunamaker_Line_012 224.59 2.39 3.74 Open
Nunamaker_Line_013 216.03 3.62 10.44 Open
Nunamaker_Line_014 213.74 3.58 10.23 Open
Nunamaker_Line_015 195.51 4.68 20.76 Open
Nunamaker_Line_016 184.11 4.41 18.57 Open
Nunamaker_Line_017 66.67 1.60 2.83 Open Nunamaker_Line_018 87.48 2.10 4.68 Open
Nunamaker_Line_019 118.27 2.83 8.18 Open
Nunamaker_Line_020 170.43 4.08 16.10 Open
Nunamaker_Line_021 170.43 4.08 16.10 Open
Nunamaker_Line_022 146.19 3.50 12.12 Open
Nunamaker_Line_023 132.51 3.17 10.10 Open
Nunamaker_Line_024 81.78 1.96 4.13 Open
Nunamaker_Line_025 65.54 1.63 3.02 Open
Nunamaker_Line_026 15.11 0.36 0.18 Open
Nunamaker_Line_027 137.93 3.18 9.91 Open
Oanna_000a 11403.75 4.55 1.81 Open
Oanna_000b 11403.75 4.61 0.00 Open
Oanna_001 10742.54 4.91 2.24 Open
Oanna_002 10742.54 4.91 2.24 Open

Oanna_003 10742.54 4.50 1.82 Open
Oanna_004 10641.07 4.46 1.44 Open Oanna_006 9731.92 4.82 2.27 Open
Oanna_007 9731.92 4.82 2.30 Open
Oanna_008 562.59 3.83 6.85 Open
Oanna_009b 8801.12 4.94 2.56 Open
Oanna_010 300.39 3.45 7.44 Open
Oanna_011a 368.21 4.23 11.60 Open
Oanna_012 368.21 4.23 11.23 Open
Oanna_013 9169.33 4.54 2.03 Open
Omori_Line_001 1000.91 4.05 5.61 Open
Omori_Line_002 375.63 4.15 10.58 Open
Omori_Line_003 295.83 3.27 6.80 Open
Omori_Line_004 102.03 2.44 6.22 Open
Omori_Line_005 50.73 1.21 1.71 Open
Paasch_Line_000 972.12 4.84 8.82 Open
Paasch_Line_001 407.56 4.69 13.55 Open
Paasch_Line_002 613.33 4.17 8.04 Open
Paasch_Line_003 913.99 3.70 4.75 Open Paasch_Line_005 802.56 3.51 4.52 Open
Poole_Line_000 302.39 3.48 7.78 Open
Poole_Line_001 302.39 3.67 8.90 Open
Poole_Line_002 172.71 4.30 18.15 Open
Poole_Line_003 91.20 2.27 5.56 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Rasmussen_Line_001 1796.36 4.44 4.80 Open
Rasmussen_Line_002 1776.42 4.58 5.42 Open Rasmussen_Line_003a 1501.68 4.80 6.73 Open
Rasmussen_Line_004 1225.23 4.96 8.17 Open
Rasmussen_Line_005 690.84 4.34 8.28 Open Rasmussen_Line_007 668.04 4.35 8.47 Open
Rasmussen_Line_008 493.63 3.21 4.83 Open
Rasmussen_Line_009 57.00 1.37 2.12 Open
Rasmussen_Line_010 424.38 4.69 13.26 Open
Rasmussen_Line_011 408.41 4.51 12.35 Open
Rasmussen_Line_012 408.41 4.51 12.35 Open
Rasmussen_Line_013 394.16 4.36 11.56 Open
Rasmussen_Line_014 258.79 2.86 5.30 Open
Rasmussen_Line_015 258.79 2.86 5.30 Open
Rasmussen_Line_016 258.79 2.86 5.30 Open
Rasmussen_Line_017 249.10 2.75 4.94 Open
Rasmussen_Line_018 232.00 2.56 4.33 Open
Rasmussen_Line_019 222.88 2.46 4.02 Open
Rasmussen_Line_020 118.86 2.85 8.26 Open
Rasmussen_Line_021 97.19 2.33 5.69 Open
Rasmussen_Line_022 436.63 4.82 13.97 Open Rasmussen_Line_023 359.11 3.97 9.73 Open
Rasmussen_Line_024 353.41 3.91 9.45 Open
Rasmussen_Line_025 291.84 3.36 7.30 Open
Rasmussen_Line_026 178.41 4.44 19.27 Open
Rasmussen_Line_027 178.41 4.44 19.27 Open
Rasmussen_Line_029 178.41 4.44 19.27 Open
Rasmussen_Line_030 22.80 0.53 0.35 Open
Rasmussen_Line_031 104.02 2.49 6.45 Open
Rasmussen_Line_032 72.11 1.80 3.60 Open
Rasmussen_Line_034 16.53 0.41 0.24 Open
Rasmussen_Line_035 3.41 0.09 0.01 Open
Rasmussen_Line_036 54.44 1.30 1.95 Open
Rasmussen_Line_037 49.59 1.19 1.64 Open
Rasmussen_Line_038 97.19 2.33 5.69 Open
Rasmussen_Line_039 274.74 3.16 6.53 Open
Rasmussen_Line_040 202.36 3.54 10.33 Open Rasmussen_Line_041 174.41 4.18 16.80 Open
Rock_Acres_Line_000 502.20 3.42 5.55 Open Rock_Acres_Line_001 502.20 3.42 5.55 Open
Rock_Acres_Line_002 226.59 2.42 3.80 Open Rock_Acres_Line_003 225.45 2.49 4.11 Open
Rock_Acres_Line_004 226.02 2.50 4.13 Open Rock_Acres_Line_005 220.88 2.44 3.96 Open
Rock_Acres_Line_006 199.79 4.78 21.62 Open Rock_Acres_Line_007 71.26 1.71 3.20 Open
Rock_Acres_Line_008 80.37 1.92 4.00 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Rock_Acres_Line_009 203.78 4.88 22.44 Open Rock_Acres_Line_013 71.26 1.71 3.20 Open
Shaw_Line_000 59.86 1.49 2.55 Open
Shaw_Line_003 76.39 1.90 4.01 Open
Shaw_Line_004 13.39 0.33 0.16 Open
Shaw_Line_005 493.34 3.36 5.37 Open
Shaw_Line_006 349.99 4.02 10.23 Open
Shaw_Line_007 395.31 4.55 12.81 Open
Shaw_Line_008 310.94 3.58 8.21 Open
Shaw_Line_009 281.31 3.24 6.82 Open
Shaw_Line_010 166.46 4.15 16.95 Open
Shaw_Line_011 336.59 3.87 9.51 Open
Shaw_Line_012 328.04 3.77 9.07 Open
Shaw_Line_013 336.59 3.87 9.51 Open Sheirbon_Hill_Line_000 621.02 4.22 8.24 Open
Sheirbon_Hill_Line_002a 609.62 4.71 10.86 Open Sheirbon_Hill_Line_003 481.94 3.03 4.25 Open Sheirbon_Hill_Line_004 481.94 3.03 4.25 Open Sheirbon_Hill_Line_005 581.12 3.65 6.01 Open Sheirbon_Hill_Line_006 333.74 3.56 7.78 Open Sheirbon_Hill_Line_007 134.81 3.23 10.43 Open Sheirbon_Hill_Line_008 198.93 4.58 19.52 Open Sheppard_Ditch_000 388.74 4.72 14.18 Open
Sheppard_Ditch_001 222.87 2.56 4.43 Open
Sheppard_Ditch_002 222.87 2.38 3.69 Open
Sheppard_Ditch_003 388.74 4.58 13.15 Open
Sheppard_Line_000b 110.59 2.55 6.58 Open Sherrard_Road_Line_000 97.47 2.43 6.29 Open
Shute_Road_Line_000 391.57 4.17 10.47 Open Shute_Road_Line_001 380.17 4.37 11.92 Open
Shute_Road_Line_002 377.32 4.34 11.75 Open Shute_Road_Line_003 376.75 4.16 10.63 Open
Shute_Road_Line_004 373.33 4.13 10.46 Open Shute_Road_Line_005 284.42 3.14 6.32 Open
Summit_Road_Line_000 45.60 1.05 1.28 Open Summit_Road_Line_001 52.43 1.21 1.65 Open
Summit_Road_Line_002 660.63 4.15 7.62 Open Summit_Road_Line_003 111.14 2.56 6.64 Open
Summit_Road_Line_004 111.14 2.66 7.29 Open Summit_Road_Line_005 80.36 1.85 3.64 Open
Summit_Road_Line_006 660.63 4.15 7.62 Open Summit_Road_Line_007 525.24 3.30 4.98 Open
Summit_Road_Line_008 462.26 4.93 14.23 Open Summit_Road_Line_009 546.91 3.44 5.37 Open
Summit_Road_Line_010 546.91 3.44 5.37 Open Summit_Road_Line_011 457.98 4.88 13.99 Open
Summit_Road_Line_012 412.38 4.40 11.52 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Summit_Road_Line_013 370.77 3.95 9.46 Open Summit_Road_Line_014 318.34 3.39 7.13 Open
Summit_Road_Line_015 288.40 3.07 5.81 Open Summit_Road_Line_016 191.50 4.41 18.20 Open
Sweet_Line_000 29.93 0.72 0.64 Open
Sweet_Line_001 285.57 3.04 5.83 Open
Sweet_Line_002 82.09 1.89 3.79 Open
Sweet_Line_003 51.30 1.18 1.59 Open
Sweet_Line_004 315.51 3.36 7.01 Open Sweet_Line_005 315.51 3.36 7.02 Open
Sweet_Line_006 203.49 4.69 20.36 Open
Sweet_Line_007 92.33 2.13 4.71 Open
Tallman_Line_000a 1.71 0.05 0.00 Open
Thomsen_Line_000 861.27 4.67 8.68 Open
Thomsen_Line_001a 861.27 3.48 4.25 Open
Thomsen_Line_002 205.77 3.60 10.64 Open
Thomsen_Line_003 99.19 2.47 6.50 Open
Thomsen_Line_006 655.50 4.12 7.52 Open
Thomsen_Line_007 151.61 3.49 11.71 Open
Tiffany_Line_000a 11.68 0.31 0.14 Open
Webb_Drive_Line_000 154.46 3.70 13.42 Open Webb_Drive_Line_001 148.76 3.56 12.51 Open
Webb_Drive_Line_002 80.93 2.02 4.46 Open Webb_Drive_Line_003 111.71 2.78 8.10 Open
Webb_Drive_Line_004 143.06 3.43 11.64 Open Webb_Drive_Line_005 117.41 2.81 8.07 Open
Webb_Drive_Line_006 29.64 0.71 0.63 Open Webb_Drive_Line_007 5.70 0.13 0.03 Open
Webb_Drive_Line_008 14.26 0.34 0.16 Open Webb_Drive_Line_009 11.40 0.27 0.11 Open
Webb_Drive_Line_010 195.50 4.68 20.76 Open Webb_Drive_Line_011 210.32 3.52 9.93 Open
Webb_Drive_Line_012 165.86 3.97 15.31 Open Webster_Pressure_Line_000 911.15 3.69 4.72

Open Webster_Pressure_Line_001 336.30 3.87 9.50 Open Webster_Pressure_Line_002 125.97 3.14 10.12 Open Webster_Pressure_Line_003 324.90 3.74 8.91 Open Webster_Pressure_Line_004 210.33 3.52 9.93 Open Webster_Pressure_Line_005 911.15 3.69 4.71 Open Wheeler_Road_Line_000 38.77 0.97 1.14 Open Wheeler_Road_Line_001 35.91 0.89 0.99 Open Wheeler_Road_Line_002 273.32 3.02 5.87 Open Wheeler_Road_Line_003 178.41 4.27 17.52 Open Wheeler_Road_Line_004 275.03 2.93 5.44 Open Whiskey_Creek_Pipeline_001 1304.13 4.17 5.18 Open Whiskey_Creek_Pipeline_002 1252.83 3.99 4.75 Open Whiskey_Creek_Pipeline_003 1177.02 4.76 7.58 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Whiskey_Creek_Pipeline_004 914.25 3.70 4.75 Open Whiskey_Creek_Pipeline_005 914.25 3.83 5.19 Open Whiskey_Creek_Pipeline_006 658.93 4.48 9.18 Open Whiskey_Creek_Pipeline_007 645.24 4.39 8.83 Open Whiskey_Creek_Pipeline_009 503.87 3.43 5.59 Open Whiskey_Creek_Pipeline_010 503.87 3.43 5.59 Open Whiskey_Creek_Pipeline_012 710.76 4.63 9.50 Open Whiskey_Creek_Pipeline_013 699.36 4.40 8.47 Open Whiskey_Creek_Pipeline_014 658.33 4.58 9.70 Open Whiskey_Creek_Pipeline_015 601.33 3.78 6.40 Open Whiskey_Creek_Pipeline_016a 2898.89 4.17 3.24 Open Whiskey_Creek_Pipeline_017 2112.83 4.17 3.91 Open Whiskey_Creek_Pipeline_018 2022.21 3.99 3.61 Open Whiskey_Creek_Pipeline_019 2027.91 4.01 3.63 Open Whiskey_Creek_Pipeline_020 1916.76 4.94 6.24 Open Whiskey_Creek_Pipeline_021 1502.38 4.67 6.29 Open Whiskey_Creek_Pipeline_022 1450.51 4.51 5.89 Open Whiskey_Creek_Pipeline_023 1450.51 4.51 5.89 Open Whitesell_East_000 13.69 0.34 0.17 Open
Whitesell_West_000 24.23 0.60 0.48 Open Winklebleck_Line_000 527.84 3.59 6.09 Open Winklebleck_Line_001a 478.83 3.43 5.77 Open Winklebleck_Line_002 473.13 2.98 4.11 Open Winklebleck_Line_003 442.34 4.89 14.32 Open Winklebleck_Line_004 394.46 4.54 12.76 Open Winklebleck_Line_005 394.46 4.54 12.75 Open Winklebleck_Line_006 112.87 2.81 8.25 Open Winklebleck_Line_007 107.17 2.91 9.24 Open Wy'east_Road_Line_000 111.14 2.66 7.29 Open Wy'east_Road_Line_001 4.85 0.12 0.02 Open Wy'east_Road_Line_002 53.86 1.29 1.91 Open
Yasui_Line_000 661.20 4.31 8.31 Open
Yasui_Line_001 552.90 3.48 5.48 Open
Yasui_Line_002 219.46 2.34 3.58 Open
Yasui_Line_003 324.90 3.46 7.41 Open Lower_Highline_Pressure_004a 422.92 4.86 14.52 Open Lower_Highline_Pressure_028b 216.02 4.98 22.76 Open Thomsen_Line_001b 861.27 3.48 6.10 Open
Kellly_Line_000b 142.78 3.29 10.59 Open
Paasch_Line_004b 802.56 3.25 3.73 Open
Eastside_Canal_024a 6884.60 4.93 2.95 Open Dethman/Swyers_Line_000b 826.79 3.34 3.94 Open Rasmussen_Line_000a 1796.36 4.44 4.99 Open Rasmussen_Line_003b 1501.68 4.32 5.18 Open Allison_Line_001b 1000.91 4.05 5.62 Open
Oanna_005a 10641.07 4.46 1.79 Open
Nunamaker_Line_001b 738.16 4.64 9.88 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Neufeldt_Line_000b 271.89 2.90 5.32 Open
Oanna_009a 8801.12 4.57 2.17 Open
Bietler_Line_002b 271.91 2.90 5.32 Open Winklebleck_Line_001b 478.83 3.01 4.20 Open Cherry_Hill_Line_002b 147.63 3.68 13.57 Open Sheirbon_Hill_Line_002b 609.62 3.83 6.57 Open Panorama_Point_Line_000 28.50 0.66 0.53 Open Whiskey_Creek_Pipeline_024 1444.35 4.49 5.84 Open Lariza_Line_000c 385.89 4.11 10.19 Open
Lariza_Line_000b 414.39 4.42 11.60 Open Sheppard_Line_000a 110.59 3.00 12.21 Open
Tiffany_Line_000b 11.68 0.27 0.06 Open
Tallman_Line_000b 1.71 0.04 0.00 Open Dethman_Ridge_Line_001b 8301.80 4.50 2.22 Open
Oanna_011b 368.21 3.93 9.39 Open
Thomsen_Line_001c 861.27 3.48 4.21 Open
Paasch_Line_004a 802.56 3.25 3.73 Open
Paasch_Line_004c 802.56 3.25 3.72 Open
Crag_Rat_Line_002c 725.59 4.93 10.99 Open Neal_Mill_Line_002b 658.66 4.14 7.57 Open Dethman_Ridge_Line_061b 1739.36 5.00 6.84 Open Bietler_line_002c 271.91 2.90 5.37 Open Cherry_Hill_Line_002c 147.63 3.68 13.55 Open Whiskey_Creek_Pipeline_006b 2112.83 4.53 4.76 Open Whiskey_Creek_Pipeline_10b 478.79 3.01 4.20 Open Central_Lateral_Pipeline_001b

39874.56 3.14 0.35 Open Central_Lateral_Pipeline_001c 39346.72 3.10 0.34 Open Whiskey_Creek_Pipeline_10c 390.44 4.16 10.41 Open Main_Canal_Combine_000a 29000.00 4.52 1.03 Open Main_Canal_Combine_000b 29000.00 4.52 1.03 Open Main_Canal_035 21709.79 4.34 1.10 Open
V_LHP_2 216.02 2.45 262.50 Active Valve
V_LL_1 2767.64 4.42 246.81 Active Valve
V_SR_WB 18851.72 8.56 284.44 Active Valve
V_EA_WB 18754.25 8.51 145.05 Active Valve
V_CHL_2 3634.63 4.58 334.77 Active Valve
V_CHL_1 882.93 3.61 103.66 Active Valve
V_MC_WB 50709.79 4.76 108.67 Active Valve
V_CP_WB_2 836.20 2.37 0.00 Open Valve
V_DVP_1 10294.30 4.67 267.08 Active Valve V_MCL_1 2239.27 1.89 199.32 Active Valve
V_GL_1 360.23 4.09 79.71 Active Valve
V_KL 142.78 3.65 249.97 Active Valve
V_DSL 826.79 3.38 254.46 Active Valve
V_RRL 1501.68 4.26 213.23 Active Valve
V_O_2 11403.75 5.94 179.08 Active Valve
V_O_3 8801.12 3.99 243.71 Active Valve

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
V_NFL 271.89 3.09 197.05 Active Valve
V_NML 738.16 4.71 321.16 Active Valve V_AL 1000.91 4.09 82.69 Active Valve
V_WL 478.83 5.43 195.50 Active Valve
V_SHH 609.62 3.89 225.05 Active Valve
V_O_1 368.21 4.18 129.75 Active Valve
V_LRL 414.39 4.70 226.94 Active Valve
V_TFL 11.68 0.30 175.47 Active Valve
V_TLL 1.71 0.04 216.87 Active Valve
V_DRL 8301.80 5.89 182.53 Active Valve
V_SHP 110.59 2.82 220.19 Active Valve
V_WCP 127.13 3.25 49.28 Active Valve
V_LHP 388.72 4.41 63.27 Active Valve
V_HUL 203.49 2.31 107.30 Active Valve
V_TL 861.27 3.52 265.63 Active Valve
V_PL2 972.12 3.97 191.27 Active Valve
V_CR2 293.53 3.33 253.97 Active Valve V_CR3 178.97 4.57 133.78 Active Valve
V_ML 67.26 1.72 81.66 Active Valve
V_NML2 435.49 4.94 144.58 Active Valve
V_NEML 658.66 4.20 122.58 Active Valve
V_DRL2 245.38 2.78 120.72 Active Valve
V_DRL3 1739.36 4.93 46.63 Active Valve
V_BL2 324.93 3.69 71.02 Active Valve
V_GL3 7.99 0.20 198.00 Active Valve
V_WLB3 527.84 3.37 71.91 Active Valve
V_WBL4 107.17 2.74 179.65 Active Valve
V_CH3 506.16 3.23 58.83 Active Valve
V_BUL3 120.83 3.08 170.93 Active Valve
V_MBH1 145.34 0.41 218.27 Active Valve
V_DV3 7883.23 12.58 159.29 Active Valve
V_CRLO 277.59 3.15 78.25 Active Valve V_POL 302.39 3.43 227.03 Active Valve
V_RA 502.20 3.21 112.51 Active Valve
V_ACH 2098.82 3.35 179.88 Active Valve
V_FS 156.19 3.99 93.05 Active Valve
V_CHL3 147.63 3.77 153.54 Active Valve
V_SHP2 388.74 4.41 175.37 Active Valve
V_CLP 19355.60 8.79 0.00 Open Valve
V_CLP2 503.89 3.22 211.08 Active Valve
V_WCP2 658.93 1.37 138.49 Active Valve
V_WCP3 51.30 1.31 168.15 Active Valve
V_LHP2 658.33 4.20 20.48 Active Valve
V_WCP4 1252.83 3.55 0.00 Open Valve
V_MC 29000.00 5.14 3.57 Active Valve

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* E P A N E T *
* Hydraulic and Water Quality *
* Analysis for Pipe Networks *
* Version 2.0 * **

Input File: EFID_Alt.B_2018.04.24_Dual_Pipeline_merge_final.net

Link - Node Table: --
Link Start End Length Diameter
ID Node Node ft in --
Central_Lateral_Pipeline_000C01000 C01100_1 14.77 72
Central_Lateral_Pipeline_001aC01100_1 NODE_203 1307.82 72
Central_Lateral_Pipeline_002C01300 C01400 703.36 72 Central_Lateral_Pipeline_003C01400 C01500 91.48 72 Central_Lateral_Pipeline_004C01500 C01600 154.18 72
Central_Lateral_Pipeline_005C01600 C01700 24.22 72 Central_Lateral_Pipeline_006C01700 C01800 515.47 72 Central_Lateral_Pipeline_007C01800 C01900 329.85 72
Central_Lateral_Pipeline_008C01900 C02000 908.89 72 Central_Lateral_Pipeline_009C02000 C02100 254.25 72 Central_Lateral_Pipeline_010C04900 C05000 1394.16 48
Central_Lateral_Pipeline_011C05000 C05100 342.79 48 Central_Lateral_Pipeline_012C05100 C05200 323.29 30 Central_Lateral_Pipeline_015C02200 C02300 269.49 60
Central_Lateral_Pipeline_016C02400 C02500 614.54 60 Central_Lateral_Pipeline_017C02500 C02600 568.32 60 Central_Lateral_Pipeline_018C02300 C02400 754.1 60
Central_Lateral_Pipeline_019C02700 C02800 270.02 60 Central_Lateral_Pipeline_020C02600 C02700 425.61 60 Central_Lateral_Pipeline_021C03200 C03300 299.23 60
Central_Lateral_Pipeline_022C03100 C03200 286.59 60 Central_Lateral_Pipeline_023C02900 C03000 6.3 60 Central_Lateral_Pipeline_024C03000 C03100 5.9 60
Central_Lateral_Pipeline_025C02800 C02900 346.7 60 Central_Lateral_Pipeline_026NODE_023 EFID_069 2839.05 30 Central_Lateral_Pipeline_027EFID_085 EFID_084 1.72 30
Central_Lateral_Pipeline_028EFID_084 EFID_079 6.69 30
Central_Lateral_Pipeline_029aEFID_080 SR_WB_US 1350.5 30
Central_Lateral_Pipeline_029bSR_WB_DS EFID_077 0.33 30
Central_Lateral_Pipeline_030EFID_079 EFID_080 7.64 30
Central_Lateral_Pipeline_031aEFID_077 EA_WB_US 2987.26 30
Central_Lateral_Pipeline_031bEA_WB_DS EFID_400 0.12 30 Christopher_Pipeline_000bM04300 M04500 2.92 24 Christopher_Pipeline_001M04500 M04600 2.11 24
Christopher_Pipeline_002AM04600 NODE_200 820.84 24 Christopher_Pipeline_002BNODE_200 CP_WB_US_2 270.15 14.3 Christopher_Pipeline_002CCP_WB_DS_2 M04401 410.32 14.3

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
Christopher_Pipeline_003M04401 M04403 2369.51 14.3 Christopher_Pipeline_004M04403 NODE_002 1171.78 14.3 Christopher_Pipeline_005NODE_002 M04404 245.03 9.53
Christopher_Pipeline_006M04404 M04405 376.65 9.53 Christopher_Pipeline_007M04405 M04406 373.97 9.53 Christopher_Pipeline_008M04407 M04408 215.87 9.53
Christopher_Pipeline_009M04406 M04407 224.87 9.53 Christopher_Pipeline_010M04408 M04409 6.79 9.53 Christopher_Pipeline_011NODE_002 M04410 499.55 7.63
Christopher_Pipeline_012M04410 M04411 29.17 7.63 Christopher_Pipeline_013M04411 M04412 22.93 9.53 Christopher_Pipeline_014M04412 M04413 230.28 7.63
Christopher_Pipeline_015aM04413 NODE_202 555.3 7.63 Christopher_Pipeline_015bNODE_202 M04414 164.86 5.74 Christopher_Pipeline_016M04414 M04415 476.81 5.74
Christopher_Pipeline_017M04416 NODE_004 339.47 5.74 Christopher_Pipeline_018M04415 M04416 8.4 5.74 Christopher_Pipeline_019NODE_004 M04417 214.71 4.13
Christopher_Pipeline_020M04417 M04418 82.47 4.13 Christopher_Pipeline_021M04418 M04419 250.4 4.05 Christopher_Pipeline_022NODE_004 M04420 73.27 4.13
Christopher_Pipeline_024M04422 M04423 136.84 4.13 Christopher_Pipeline_025M04421 M04422 111.06 4.13 Christopher_Pipeline_026M04420 M04421 185.24 4.05 Highline_Canal_001DV04918 DV04919 717.06 6.19 Highline_Canal_002DV04917 DV04918 710.81 6.19
Highline_Canal_003DV04900 US_DV3 21.63 23.1 Highline_Canal_004DV04916 NODE_112 117.25 10.05 Highline_Canal_005DV04915 DV04916 161.2 10.05 Highline_Canal_006DV04914 DV04915 146.94 10.05 Highline_Canal_007DV04912_DV04913DV04914 374.29 10.05
Highline_Canal_008DV04911 DV04912_DV04913 386.85 10.05 Highline_Canal_009DV04910 DV04911 238.61 10.05 Highline_Canal_010DV04909 DV04910 623.93 10.05 Highline_Canal_011DV04908

DV04909 2634.07 10.05 Highline_Canal_012DV04907 DV04908 396.99 10.05 Highline_Canal_013DV04901 DV04902 1900.94 14.8 Highline_Canal_014DV03700 DV04901 635.99 14.8 Highline_Canal_015DV04902 DV04903 1055.41 14.8 Highline_Canal_016DV04906 DV04907 1290.36 11.92 Highline_Canal_017DV04905 DV04906 451.28 11.92 Highline_Canal_018DV04903 DV04904A_B 200.7 14.8 Highline_Canal_019aDV04904A_B DV05000_2 173.82 14.8 Highline_Canal_020DV05000_2 DV04905 1217.91 11.92 Ackerman_Hill_000DV04531 NODE_093 103.85 8.06 Ackerman_Hill_001DV04530 DV04531 170.69 8.06 Ackerman_Hill_002DV04527 DV04528 327.17 8.06

 Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Ackerman_Hill_003DV04528 DV04530 56.34 8.06 Ackerman_Hill_004DV04529 DV04527 84.55 8.06 Ackerman_Hill_005DV04507 DV04529 203.14 10.05 Ackerman_Hill_006DV04502 DV04501 848.26 11.92 Ackerman_Hill_007EFID_033 DV04505 622.54 10.05 Ackerman_Hill_008DV04503 DV04504 15.99 10.05 Ackerman_Hill_009DV04501 DV04503 469.33 11.92 Ackerman_Hill_010DV04504 EFID_033 681.65 10.05 Ackerman_Hill_011DV04506 DV04507 286.32 9.87 Ackerman_Hill_013DV04505 DV04506 1376.61 9.87 Ackerman_Hill_014DV04100 US_ACH 1408.96 14.38 Ackerman_Hill_016DV04543 NODE_095 13.87 4.13 Ackerman_Hill_017DV04537 DV04543 242.52 4.13 Ackerman_Hill_018DV04532 DV04535 618.31 4.21 Ackerman_Hill_019DV04535 DV04536 210.65 4.21 Ackerman_Hill_020DV04536 DV04537 310.27 4.13 Ackerman_Hill_021NODE_093 DV04532 5.01 8.06 Ackerman_Hill_022NODE_096 DV04544A 286.47 4.05 Ackerman_Hill_023NODE_095 DV04538_DV04539 916.74 4.05 Ackerman_Hill_024DV04538_DV04539DV04540 100.01 4.05 Ackerman_Hill_025DV04529 DV04508 462.99 4.13 Ackerman_Hill_026DV04508 Hernandez_Line 17.54 4.13 Ackerman_Hill_027DV04516 DV04515 2.59 4.13 Ackerman_Hill_028DV04514 DV04516 130.73 4.13 Ackerman_Hill_029DV04513 DV04514 70.47 4.13 Ackerman_Hill_030DV04512 DV04513 12.02 4.13 Ackerman_Hill_031DV04511 DV04512 235.56 4.13 Ackerman_Hill_032DV04510 DV04511 95.33 4.13 Ackerman_Hill_033DV04509 DV04510 75.36 4.13 Ackerman_Hill_034EFID_106 DV04509 41.58 4.13 Ackerman_Hill_035Hernandez_Line EFID_106 177.05 4.13 Ackerman_Hill_036Hernandez_Line NODE_091 694.61 4.13 Ackerman_Hill_037NODE_091 NODE_092 44.18 4.13 Ackerman_Hill_038NODE_092 DV04518 328.99 4.13 Ackerman_Hill_039NODE_094 DV04520 16.92 4.13 Ackerman_Hill_040DV04525 DV04526 357.1 4.13 Ackerman_Hill_041DV04524 DV04525 174.52 4.13 Ackerman_Hill_042DV04520 DV04524 69.99 4.13 Ackerman_Hill_043NODE_094 DV04521 53.14 4.13 Ackerman_Hill_044DV04521 DV04522 57.54 4.13 Ackerman_Hill_045DV04522 DV04523 91.85 4.13 Ackerman_Hill_046DV04545 DV04547_DV04546 462.75 4.05 Ackerman_Hill_047DV04532 DV04533 484.13 8.06 Ackerman_Hill_048DV04533 DV04534 626.41 4.21 Ackerman_Hill_049Summit_Road_LineDV04502 20.12 11.92 Ackerman_Hill_050NODE_091 DV04519 21.05 4.13 Ackerman_Hill_051DV04519 NODE_094 294.19 4.13

Link - Node Table: (continued) --
Link Start End Length Diameter ID Node Node ft in -- Ackerman_Hill_052NODE_095 NODE_096 538.46 4.05 Ackerman_Hill_053NODE_096 DV04545 112.09 4.05 Ackerman_Hill_054DV04538_DV04539DV0454_DV04542 159.02 4.05 Ackerman_Hill_055DV04545 DV04544B 26.21 4.05 Allison_Line_000C04900 C04800 454.55 10.05 Allison_Line_001aC04800 AL_US 2459.56 9.41 Allison_Line_002C04901A C04901Ba 339.84 8.06 Allison_Line_003C04901Ba C04901Bb_C04901C 5.06 6.19 Arens_Lateral_Line_000M05900 M05900A 0.01 4.21 Arens_Lateral_Line_001M05900 M05900B 1334.39 6.19 Bailey/Luse/Schultz_000NODE_114 M03000 31.54 45.517 Bailey_Line_000NODE_008 C03708 683.45 4.05 Bartlett_Loop_000NODE_076 DV04302 1725.75 4.13 Bartlett_Loop_007NODE_137 NODE_075 6.8 4.21 Bartlett_Loop_008NODE_075 DV04301 12.26 4.21 Bartlett_Loop_009NODE_075 NODE_076 30.19 4.21 Bartlett_Loop_010NODE_076 NODE_089 5.21 4.21 Bartlett_Loop_011NODE_089 DV04303 29.64 4.21 Bietler_Line_000C01700 EFID_081 6.73 6.19 Bietler_Line_001EFID_081 US_BL2 565.53 5.96 Bietler_Line_002aC01701 BL_US 1151.72 6.19 Bietler_Line_003EFID_076 C01702 53.5 6.08 Bietler_Line_004C01702 C01703A 407.51 5.96 Bietler_Line_005C01703A C01703B 9.14 4.05 Bowcut_Pipeline_000M04210 NODE_113 557.32 6.19 Bowcut_Pipeline_001M04209 M04210 187.53 6.19 Bowcut_Pipeline_002M04207 M04208 363.25 6.19 Bowcut_Pipeline_003M04208 M04209 74.91 6.19 Bowcut_Pipeline_004M04206 M04207 412.59 6.19 Bowcut_Pipeline_005M04205 M04206 23.75 6.19 Bowcut_Pipeline_006M04204 M04205 13.3 6.19 Bowcut_Pipeline_007M04203 M04204 1429.69 10.05 Bowcut_Pipeline_008M04202 M04203 433.83 6.19 Bowcut_Pipeline_009M04200_2 M04201 283.11 6.19 Bowcut_Pipeline_010M04201 M04202 0.1 6.19 Bowcut_Pipeline_011M04202 M04200_1 0.04 4.21 Bowcut_Pipeline_012NODE_113 M04212 26.26 4.21 Bowcut_Pipeline_013M04212 M04211 1.79 4.21 Bowcut_Pipeline_014M04216 M04215 229.29 4.21 Bowcut_Pipeline_015M04214 M04216

0.93 4.13 Bowcut_Pipeline_016NODE_115 M04214 1552.59 6.08 Bowcut_Pipeline_017NODE_115 M04213 79.69 4.21 Bowcut_Pipeline_018NODE_113 NODE_115 744.85 6.19 Buckley_Line_000C02218A US_BL3 653.2 3.94 Buckley_Line_001C02218B C02218C 730.93 4.21 Cameron_Hill_000EFID_087 EFID_086 234.51 5.96 Cameron_Hill_001aDV01101 EFID_087 1310.61 6.08

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --

Cameron_Hill_003DV01100_DV01000US_CH3 1359.65 7.75 Central_Lateral_Pipeline_013EFID_085 EFID_083 16.62 8.06 Central_Lateral_Pipeline_014EFID_083 US_CLP2 1372.5 6.96
Central_Lateral_Pipeline_032E01000C E01000D 913.62 4.13
Central_Lateral_Pipeline_033NODE_023 E01000C 841.56 4.13
Central_Lateral_Pipeline_044C02100 C02200 22.1 72 Central_Lateral_Pipeline_045C03300 EFID_099 710.91 48 Central_Lateral_Pipeline_046C04500 C04600 697.13 48
Central_Lateral_Pipeline_047EFID_099 C04200 52.73 48 Central_Lateral_Pipeline_048C04400 C04500 607.37 48 Central_Lateral_Pipeline_049C04300 C04400 284.03 48
Central_Lateral_Pipeline_050C04200 C04300 302.65 48 Central_Lateral_Pipeline_051C04600 C04700 298.79 48 Central_Lateral_Pipeline_052C04700 C04900 264.4 48
Central_Lateral_Pipeline_053C05200 US_CLP 15.32 30 Central_Lateral_Pipeline_054EFID_400 NODE_023 829.34 30 Chamberlin_Pressure_Line_000DV04612 EFID_023 523.29 9.87
Chamberlin_Pressure_Line_001NODE_060 DV04610 58.23 10.05
Chamberlin_Pressure_Line_002DV04611 DV04612 123.91 10.05
Chamberlin_Pressure_Line_003DV04610 DV04611 1314.96 10.05
Chamberlin_Pressure_Line_004EFID_019 DV04618 830.84 7.75
Chamberlin_Pressure_Line_005DV04618 DV04619 11.72 5.96
Chamberlin_Pressure_Line_006DV04619 EFID_014 575.84 5.96
Chamberlin_Pressure_Line_007EFID_014 DV04620 100.34 5.96
Chamberlin_Pressure_Line_008DV04620 DV04621 6.89 4.05 Chamberlin_Pressure_Line_009DV04621 NODE_064 26.73 4.05 Chamberlin_Pressure_Line_010NODE_055 NODE_056 10.22 4.21
Chamberlin_Pressure_Line_011NODE_056 DV04602 1269.98 4.21
Chamberlin_Pressure_Line_012EFID_024 DV04606 722.39 4.21
Chamberlin_Pressure_Line_013EFID_023 DV04614 619.51 7.92
Chamberlin_Pressure_Line_014DV04614 DV04615 23.67 7.92
Chamberlin_Pressure_Line_015DV04615 DV04616 50.01 7.92
Chamberlin_Pressure_Line_016EFID_018 EFID_019 400.12 7.75
Chamberlin_Pressure_Line_017DV04616 EFID_018 284.55 7.92
Chamberlin_Pressure_Line_018NODE_064 DV04621B 145.37 4.05
Chamberlin_Pressure_Line_019EFID_019 DV04617 674.49 4.05
Chamberlin_Pressure_Line_020NODE_060 NODE_059 669.65 6.19
Chamberlin_Pressure_Line_021NODE_055 DV04604 1300.49 14.96
Chamberlin_Pressure_Line_023DV04605 EFID_024 627.67 11.92
Chamberlin_Pressure_Line_024DV04604 DV04605 38.5 13.09
Chamberlin_Pressure_Line_025NODE_133 NODE_131 370.71 16.18
Chamberlin_Pressure_Line_026NODE_131 DV04601 80.72 16.18
Chamberlin_Pressure_Line_027DV04603 MCL_US_1 676.99 14.38
Chamberlin_Pressure_Line_028DV04601 DV04603 217.47 14.38
Chamberlin_Pressure_Line_029NODE_059 DV04609 18.25 4.21
Chamberlin_Pressure_Line_030NODE_059 DV04608 10.81 4.21
Chamberlin_Pressure_Line_031EFID_024 DV04607 318.81 11.92

Link - Node Table: (continued) -- Link Start End Length Diameter
ID Node Node ft in --

Chamberlin_Pressure_Line_032DV04607 NODE_060 307.64 11.92
Chamberlin_Pressure_Line_033DV04613 NODE_134 21.41 4.94
Chamberlin_Pressure_Line_034EFID_023 DV04613 11.57 6.08
Chamberlin_Pressure_Line_035NODE_064 DV04621A 129.48 4.05
Chamberlin_Pressure_Line_036NODE_051 NODE_052 229.55 22.04
Chamberlin_Pressure_Line_037NODE_058 NODE_057 111.94 23.38
Chamberlin_Road_Line_Overflow_000DV05006 DV05007 990.88 5.96
Chamberlin_Road_Line_Overflow_001DV05008 DV05009 1322.33 4.13
Chamberlin_Road_Line_Overflow_001bDV05009 DV05010 2090.65 4.13
Chamberlin_Road_Line_Overflow_002DV05007 US_CRLO 353.4 5.96 Cherry_Hill_Line_000DV02500

US_CHL3 449.7 3.94 Cherry_Hill_Line_001EFID_058 EFID_057 11.34 4.21 Cherry_Hill_Line_002aEFID_057 CHH_US 1044.56 4.05 Chipping_Line_000NODE_007 C02201 1820.2 4.21 Chipping_Line_002aC02200 EFID_075 1147.8 20.23 Chipping_Line_003EFID_075 CHL_US_2 1936.29 18.53 Chipping_Line_004NODE_007 C02202 595.54 18.7 Chipping_Line_005C02202 C02203 865.52 16.83 Chipping_Line_009C02210A_B C02211AB 1542.21 11.71 Chipping_Line_010aC02211AB CHL_US_1 339.35 9.66 Chipping_Line_010bCHL_DS_1 EFID_064 0.01 10.05 Chipping_Line_011C02209 C02210A_B 1366.27 12.86 Chipping_Line_012C02208 C02209 49.21 13.09 Chipping_Line_014NODE_129 C02208 1326.65 13.09 Chipping_Line_015EFID_064 C02215 1051.96 8.06 Chipping_Line_016C02215 C02216 819.91 6.19 Chipping_Line_017C02216 C02217 705.98 5.96 Chipping_Line_018C02217 C02218A 196.32 5.96 Chipping_Line_019EFID_064 C02212 1591.11 6.19 Chipping_Line_020C02212 EFID_059 10.53 6.19 Chipping_Line_021C02203 C02204 172.52 16.83 Chipping_Line_022C02204 C02205 118.42 16.83 Chipping_Line_023C02205 C02206 300.45 16.83 Chipping_Line_024NODE_129 C02207A_F 332.87 10.05 Chipping_Line_024bC02206 NODE_129 23.63 16.83 Crag_Rat_Line_000E04100 E04200 7.09 9.87 Crag_Rat_Line_001E04101 NODE_041 3.73 7.75 Crag_Rat_Line_002aE04200 CR_US_1 1520.38 7.75 Crag_Rat_Line_002bCR_DS_1 E04101 5.55 7.75 Crag_Rat_Line_003NODE_041 US_CR2 2092.18 5.35 Crag_Rat_Line_004NODE_041 EFID_022 1816.34 3.94 Crag_Rat_Line_006NODE_042 E04103A_2 1003.42 4.13 Crag_Rat_Line_007E04104 E04105 1247.58 6.19 Crag_Rat_Line_008E04105 E04105a 268.58 4.21 Crag_Rat_Line_009E04105a E04105b 3.32 4.21 Crag_Rat_Line_010NODE_042 E04103A_1 1172.14 4.05 Crag_Rat_Line_011E04103A_1 E04103B 651.01 4.05

Link - Node Table: (continued) --
Link Start End Length Diameter ID Node Node ft in -- Crag_Rat_Line_012E04104 E04104_a 2.82 4.21 Crag_Rat_Line_013E04104_a E04104_b 50.96 4.21 Dethman/Swyers_Line_000aE05500 DSL_US 2871.06 8.68 Dethman/Swyers_Line_003NODE_035 E05500_AB 322.44 6.19 Dethman/Swyers_Line_008NODE_035 E05500_CDE 341.85 6.19 Dethman/Swyers_Line_011E05500_CDE E05500_F 309.22 4.21 Dethman_Ridge_Line_000C03700 C03701A 328.69 28.04 Dethman_Ridge_Line_001aDRL_DS C03704_C03705 1216.49 26.97 Dethman_Ridge_Line_002C03701A NODE_132 8.52 28.04 Dethman_Ridge_Line_003C03704_C03705 C03702 0.45 26.97 Dethman_Ridge_Line_004C03702 C03706_2 1.52 26.97 Dethman_Ridge_Line_005C03706_2 C03706_1 176.28 26.97 Dethman_Ridge_Line_006C03706_1 C03707 1549.36 26.97 Dethman_Ridge_Line_007C03707 NODE_008 39.48 26.97 Dethman_Ridge_Line_008NODE_008 C03709 403.66 26.17 Dethman_Ridge_Line_009C03709 C03710 450.1 26.17 Dethman_Ridge_Line_010C03710 C03800 69.28 26.17 Dethman_Ridge_Line_011C03800 EFID_046 6.64 24.3 Dethman_Ridge_Line_012EFID_046 C03711 137.62 24.3 Dethman_Ridge_Line_013C03711 C04000 85.51 24.3 Dethman_Ridge_Line_014C04000 EFID_042 121.62 22.44 Dethman_Ridge_Line_015EFID_042 C03712 175.65 22.44 Dethman_Ridge_Line_016C03712 C03713 418.06 22.44 Dethman_Ridge_Line_017C03713 C03714 551.09 22.04 Dethman_Ridge_Line_018C03714 C03715 462.5 22.04 Dethman_Ridge_Line_019C03715 EFID_034 675.89 22.44 Dethman_Ridge_Line_020EFID_027 C03725 1323.9 13.09 Dethman_Ridge_Line_021C03725 C03726 343.35 13.09 Dethman_Ridge_Line_022C03726 C03727 264.84 13.09 Dethman_Ridge_Line_023C03727 C03728 69.26 11.92 Dethman_Ridge_Line_024C03728 C03729 1175.9 11.71 Dethman_Ridge_Line_025C03729 EFID_017 51.11 11.71 Dethman_Ridge_Line_027EFID_015 C03731 921.63 4.13 Dethman_Ridge_Line_028NODE_015 NODE_016 11.95 4.13 Dethman_Ridge_Line_029NODE_016 C03732 1374.92 4.13 Dethman_Ridge_Line_030EFID_026 US_DRL2 1658.89 5.89 Dethman_Ridge_Line_031C03737 C03738_C03739 309.08 4.21 Dethman_Ridge_Line_032C03738_C03739 C03740 97.68 4.21 Dethman_Ridge_Line_034EFID_034 NODE_130 1005.71 6.19 Dethman_Ridge_Line_035NODE_130 NODE_122 361.84 4.21 Dethman_Ridge_Line_036EFID_017 NODE_015 757.43 6.08 Dethman_Ridge_Line_037NODE_130 EFID_035 0.02 4.21 Dethman_Ridge_Line_038EFID_035 C03719 2.04 4.21 Dethman_Ridge_Line_039C03719 C03717_C03718 56.42 4.21 Dethman_Ridge_Line_042C03717_C03718 C03716 17.75 4.21 Dethman_Ridge_Line_043EFID_015 C03730 9.86 4.13 Dethman_Ridge_Line_044EFID_020 C03743 266.54 10.05

Link - Node Table: (continued) --
Link Start End Length Diameter ID Node Node ft in -- Dethman_Ridge_Line_045EFID_100 C03744 148.41 7.92 Dethman_Ridge_Line_046C03743 EFID_100 275.76 8.06 Dethman_Ridge_Line_047C03744 C03745 851.52 7.75 Dethman_Ridge_Line_048C03745 C03746 1143.3 5.96 Dethman_Ridge_Line_049EFID_034 C03723 968.48 22.44 Dethman_Ridge_Line_050C03723 C03724 320.2 22.44 Dethman_Ridge_Line_051C03724 EFID_027 6.68 22.44 Dethman_Ridge_Line_052EFID_026 C03741 642.84 14.7 Dethman_Ridge_Line_053C03741 C03742

131.58 13.09 Dethman_Ridge_Line_054EFID_027 EFID_026 3.81 14.96 Dethman_Ridge_Line_055EFID_017 EFID_016 69.73 9.87 Dethman_Ridge_Line_056EFID_016 C03733 716.7 9.66 Dethman_Ridge_Line_057C03735 C03736 16.07 7.75 Dethman_Ridge_Line_058C03733 C03734 6.67 9.66 Dethman_Ridge_Line_059C03734 C03735 9.13 7.75 Dethman_Ridge_Line_060NODE_015 EFID_015 35.04 6.08 Dethman_Ridge_Line_061C03742 US_DRL3 525.26 12.86 Dethman_Ridge_Line_062NODE_122 C03720_C03720a 4.9 4.21 Dethman_Ridge_Line_063NODE_122 C03722 4.78 4.21 Dethman_Ridge_Line_064NODE_122 C03721 0.69 4.21 Dukes_Valley_Canal_000NODE_135 DV01100_DV01000 858.18 29.91 Dukes_Valley_Canal_001DV01800A_D DV01900 1770.06 28.73 Dukes_Valley_Canal_002DV01900 DV02000 912.52 28.73 Dukes_Valley_Canal_003DV02000 DV02100 259.07 28.73 Dukes_Valley_Canal_004DV02100 DV02200 103.97 28.73 Dukes_Valley_Canal_005DV02200 DV02300 854.19 28.73 Dukes_Valley_Canal_006DV02400 DV02500 20.11 28.73 Dukes_Valley_Canal_007DV02500 DV02600 2851.73 28.73 Dukes_Valley_Canal_008DV02300 DV02400 2224.23 28.73 Dukes_Valley_Canal_009DV03200 DV03300 432.16 26.97 Dukes_Valley_Canal_010DV02600 DV02700 997.28 28.73 Dukes_Valley_Canal_011DV02700 DV02800 56.89 28.73 Dukes_Valley_Canal_012DV02800 DV02900 142.24 26.97 Dukes_Valley_Canal_013DV02900 DV03100 570.54 26.97 Dukes_Valley_Canal_014DV03100 DV03200 901.85 26.97 Dukes_Valley_Canal_015DV03300 DV03400 185.45 26.97 Dukes_Valley_Canal_016DV03400 DV03500 13.81 26.97 Dukes_Valley_Canal_017DV03500 DV03600 217.67 26.97 Dukes_Valley_Canal_018DV03600 DV04900 16 26.97 Dukes_Valley_Canal_019EFID_082 EFID_073 4014.42 30.57 Dukes_Valley_Canal_020EFID_073 DV01200 1324.43 30.57 Dukes_Valley_Canal_021DV01200 DV01300 149.32 30.57 Dukes_Valley_Canal_022DV01700 DV01800A_D 106.91 28.73 Dukes_Valley_Canal_023DV01300 DV01400 1591.66 28.73 Dukes_Valley_Canal_024DV01600 DV01700 911.89 28.73 Dukes_Valley_Canal_025DV01400 DV01500 80.01 28.73 Dukes_Valley_Canal_026DV01500 DV01600 425.26 28.73

Link - Node Table: (continued) --

Link Start End Length Diameter ID Node Node ft in -- Dukes_Valley_Pipeline_000aDV01100_DV01000DVP_US_1 2964.4 30.35 Dukes_Valley_Pipeline_000bDVP_DS_1 DV01102 0.21 29.91 Dukes_Valley_Pipeline_001DV01102 EFID_082 942.12 30.57 Dukes_Valley_Pipeline_002EFID_088 NODE_135 640.49 29.91 Dunphin/Castaneda_Line_000NODE_132 C03701B 1.56 6.19 Eastside_Auxillary_000EFID_400 E01200 25.2 6.19 Eastside_Auxillary_001E01200 E01201 3271.31 5.96 Eastside_Auxillary_002E01201 E01202 157.57 5.96 Eastside_Auxillary_003E01202 E01203 123.82 4.94 Eastside_Auxillary_003bE01203 E01204 30.05 4.13 Eastside_Auxillary_004E01204 E01205 29.62 4.13 Eastside_Auxillary_005E01205 E01206 10.37 4.13 Eastside_Auxillary_006E01206 E01207 339.37 4.13 Eastside_Auxillary_007E01207 E01208 186.63 4.13 Eastside_Auxillary_008E01208 E01209 10.9 4.13 Eastside_Canal_000EFID_069 EFID_094 551.45 39.83 Eastside_Canal_000_1EFID_094 E01900 66.17 39.83 Eastside_Canal_002E01900 E02100 944.55 39.83 Eastside_Canal_003E02000 E02200 422.44 39.83 Eastside_Canal_006E02100 E02000 396.18 39.83 Eastside_Canal_007E02200 E02300 2570.32 39.83 Eastside_Canal_008E02300 E02400 208.97 39.83 Eastside_Canal_009E02400 E02500 461.91 39.83 Eastside_Canal_010E02500 NODE_024 1251.53 38.576 Eastside_Canal_011NODE_024 E02700 1689.53 38.576 Eastside_Canal_012E02700 E02800 212.14 38.576 Eastside_Canal_013E02800 E02900 557.56 38.576 Eastside_Canal_014E02900 EFID_054 389.81 38.576 Eastside_Canal_015EFID_054 NODE_117 1560.01 38.576 Eastside_Canal_016NODE_034 E06000_2 0.02 21.58 Eastside_Canal_017E06000_2 E06100 394.87 21.58 Eastside_Canal_018E06100 E06200 130.45 17.98 Eastside_Canal_019E06200 E06300 451.67 18.37 Eastside_Canal_020E04900 E05000 396.5 25.72 Eastside_Canal_021E05000 E05100 576.61 25.72 Eastside_Canal_022E05100 E05200 1480.22 25.72 Eastside_Canal_023E05200 E05400 807.16 25.72 Eastside_Canal_025E05400 E05300 14 25.72 Eastside_Canal_026E03300 E03400 2086.76 38.576 Eastside_Canal_027E03400 E03500 1047.59 38.576 Eastside_Canal_028E03500 E03600 809.08 38.576 Eastside_Canal_029E03600 E03700 792.04 38.576 Eastside_Canal_030E03801 E03800_E03803 0.01 38.576 Eastside_Canal_031E03700 E03801 1688.3 38.576 Eastside_Canal_032E03800_E03803 E03900 294.02 38.576 Eastside_Canal_033E03900 E04000 486.71 38.576 Eastside_Canal_034E04000 E04100 1017.33 38.576

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Eastside_Canal_035E05500 E05600 784.04 23.38 Eastside_Canal_036E05600 E05700 652.08 21.58 Eastside_Canal_037E05700 E05800 73.43 21.58 Eastside_Canal_038E05800 E05900 1062.63 21.58

Eastside_Canal_039E05900 NODE_034 273.1 21.58 Eastside_Canal_041E06300 EFID_007 302.08 16.18 Eastside_Canal_042NODE_117 E03000B 54.38 38.576 Eastside_Canal_043EFID_095 E03200A 761.98 38.576 Eastside_Canal_044E03000B E03100 234.6 38.576 Eastside_Canal_045E03100 EFID_095 7.97 38.576 Eastside_Canal_046E03200C E03300 20.89 38.576 Eastside_Canal_047E03200B E03200C 282.92 38.576 Eastside_Canal_048E03200A E03200B 55.05 38.576 Eastside_Canal_049E04100 E04300_1 533.4 33.06 Eastside_Canal_050E04300_2 E04400 278.38 33.06 Eastside_Canal_051E04300_1 E04300_2 31.68 33.06 Eastside_Canal_052E04400 E04500 396.3 33.06 Eastside_Canal_053E04500 E04600 430.38 33.06 Eastside_Canal_054E04600 E04700 229.49 33.06 Eastside_Canal_055EFID_096 E04900 0.01 33.06 Eastside_Canal_056E04700 E04800 171.28 33.06 Eastside_Canal_057E04800 EFID_096 1305.01 33.06 Ehrentraut_000 NODE_117 E03000A 32.42 4.13 Fisher_Line_000NODE_022 US_FS 1691.05 4 Fisher_Line_001EFID_090 M02400_M02500 671.56 4.21 Fisher_Line_002EFID_089 EFID_090 1190.57 4.21 Gilkerson_Line_000C01400 C01401B 4.78 6.19 Gilkerson_Line_001C01403B C01403A 2.6 4.21 Gilkerson_Line_002C01403A US_GL3 1306.53 3.88 Gilkerson_Line_003C01401B C01401A 0.63 6.19 Gilkerson_Line_004aC01401A GL_US_1 2089.17 5.8 Gilkerson_Line_004bGL_DS_1 C01403B 0.76 6.19 Gilkerson_Line_005EFID_074 C01403C 750.46 4.05 Highline_Canal_000NODE_112 DV04917 280.18 4.21 Hukari_Line_000NODE_139 E06617 922.64 4.78 Hukari_Line_002NODE_031 E06617A 1284.19 4.05 Hukari_Line_003NODE_031 E06617B 702.72 4.13 Kellly_Line_000aNODE_034 KL_US 1529.8 4.34 Kellly_Line_001EFID_009 E06000_1 1476.13 4.13 Kennedy_Line_000EFID_059 C02213 471.81 6.08 Lariza_Line_000aEFID_098 US_LRL 1144.49 6.19 Lariza_Line_001E06609_B E06609_A 4.91 4.21 Lenz_Butte_Line_000C03800 EFID_047 9.44 10.05 Lenz_Butte_Line_001EFID_049 EFID_048 177.75 10.05 Lenz_Butte_Line_002EFID_048 C03801 58.58 10.05 Lenz_Butte_Line_003C03801 C03802 235.98 10.05 Lenz_Butte_Line_004EFID_047 EFID_049 164.77 10.05

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Lenz_Butte_Line_005C03802 C03900 428.12 10.05 Lenz_Butte_Line_006EFID_039 C03804 400.24 6.08 Lenz_Butte_Line_007NODE_011 NODE_012 6.13 4.21 Lenz_Butte_Line_008NODE_012 C03805 359.58 4.21 Lenz_Butte_Line_010C03900 EFID_043 12.18 6.19 Lenz_Butte_Line_011EFID_043 C03803 821.93 6.19 Lenz_Butte_Line_012C03803 EFID_039 131.55 6.19 Lenz_Butte_Line_013NODE_011 C03806 86.82 4.21 Lenz_Butte_Line_014EFID_039 NODE_011 19 4.21 Loop_Line_000 NODE_039 E04906 61.85 4.21 Loop_Line_001 NODE_040 E04909 321.52 4.13 Loop_Line_001a EFID_012 E04905 2791.46 16.83 Loop_Line_002 EFID_101 E04921 293.04 4.05 Loop_Line_003 EFID_101 E04920_C 37.11 4.05 Loop_Line_004 E04920_C E04920_A 630.73 4.05 Loop_Line_005 E04920_A E04920_B 44.66 4.05 Loop_Line_006 EFID_102 E04916 224.48 7.92 Loop_Line_007 E04916 EFID_103 13.88 4.13 Loop_Line_008 EFID_103 E04917 1800.79 4.05 Loop_Line_009 E04917 E04918 30.46 4.05 Loop_Line_010 E04919_AB EFID_101 1866.85 5.96 Loop_Line_011 EFID_011 EFID_010 1575.21 11.71 Loop_Line_012 EFID_010 E04912 52.16 11.71 Loop_Line_013 E04912 E04913 187.78 11.71 Loop_Line_014 E04913 E04914 289.46 9.87 Loop_Line_015 E04914 E04915 667 9.87 Loop_Line_016 E04915 EFID_102 306.23 9.87 Loop_Line_017 EFID_102 E04919_AB 411.29 6.4 Loop_Line_020 E04905 NODE_039 155.29 14.96 Loop_Line_021 E04900 E04901 520.61 21.58 Loop_Line_022 E04902 E04903B 281.06 21.58 Loop_Line_023 E04903B E04903A 74.95 17.98 Loop_Line_024a E04903A LL_US_1 764.51 16.15 Loop_Line_024b LL_DS_1 EFID_012 16.08 16.83 Loop_Line_025 E04901 E04902 1101.24 21.58 Loop_Line_026 NODE_040 E04910 655.25 10.05 Loop_Line_027 E04910 EFID_104 113.43 4.21 Loop_Line_028 EFID_104 E04911 68.98 4.21 Loop_Line_029 E04907_2 EFID_011 633.5 14.7 Loop_Line_030 EFID_011 NODE_040 449.11 9.87 Loop_Line_035 NODE_040 E04908_1 674.67 4.13 Loop_Line_036 EFID_012 E04904 439.9 4.21 Loop_Line_038 NODE_039 E04907_2 575.01 14.7 Lower_Highline_Pressure_001EFID_001 E06700 23.14 8.06 Lower_Highline_Pressure_003E06702B_1 NODE_026 1.72 6.19 Lower_Highline_Pressure_005E06700 E06621 78.98 8.06 Lower_Highline_Pressure_006E06705B E06705A 350.74 4.21

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Lower_Highline_Pressure_007E06705CD E06705B_2 299.26 4.21 Lower_Highline_Pressure_008E06705B_2 E06706 448.45 4.21 Lower_Highline_Pressure_009E06705A E06705CD 2.33 4.21 Lower_Highline_Pressure_014E06706 E06707A 398.02 4.21 Lower_Highline_Pressure_015E06707A NODE_027 4.21 4.21 Lower_Highline_Pressure_016NODE_027 E06707E 435.79 4.13 Lower_Highline_Pressure_017NODE_027 E06707AB 877.45 4.05

Lower_Highline_Pressure_018NODE_027 E06707D 19.7 4.21 Lower_Highline_Pressure_019E06707D E06707C 1042.55 4.05 Lower_Highline_Pressure_020aNODE_026 E06703A 523.59 6.08 Lower_Highline_Pressure_021E06703A NODE_025 1.28 6.08 Lower_Highline_Pressure_024NODE_026 E06702A 578.94 4.13 Lower_Highline_Pressure_025E06702A E06702A_2 413.6 4.05 Lower_Highline_Pressure_027NODE_025 E06704 32.53 5.96 Lower_Highline_Pressure_028aE06704 LHP_US_2 440.03 4.83 Main_Canal_001 Reservoir_2 M01100_2 1679.32 51.208 Main_Canal_002 M01100_2 MHID_POD 1361.33 51.208 Main_Canal_003 MHID_POD M01100_1 206.18 51.208 Main_Canal_004 M01100_1 MHID_POD_East 3988.15 51.208 Main_Canal_005 MHID_POD_East M01200 6382.93 51.208 Main_Canal_006 M01200 M01300 907.01 45.517 Main_Canal_007 M01300 M01400 368.74 45.517 Main_Canal_008 M01400 M01500 543.23 45.517 Main_Canal_009 M01500 M01600 1076.02 45.517 Main_Canal_010 M01600 M01700B 1148.74 45.517 Main_Canal_011 M02000B M02000A 41.08 45.517 Main_Canal_012 M02000A M02100 718.26 45.517 Main_Canal_013 M01700B M01700A 0.01 45.517 Main_Canal_014 M01700A M01800 620.21 45.517 Main_Canal_015 M01800 M01900 292.25 45.517 Main_Canal_016 M01900 M02000B 632.28 45.517 Main_Canal_017 M02100 M02200 240.39 45.517 Main_Canal_018 M02200 M02300A_C 348.72 45.517 Main_Canal_019 M02300A_C NODE_022 801.44 45.517 Main_Canal_021 M04300 M04700 584.99 45.517 Main_Canal_022 M05100 M05000 0.01 45.517 Main_Canal_023 M05000 M05200 208.71 45.517 Main_Canal_024 M04900 M05100 3.89 45.517 Main_Canal_025 M04700 M04800 104.2 45.517 Main_Canal_026 M04800 M04900 86.33 45.517 Main_Canal_027 M05200 M05300 459.38 45.517 Main_Canal_028 M05300 M05400 222.24 45.517 Main_Canal_029 M05400 M05500 11.3 45.517 Main_Canal_030 M05500 M05600 437.51 45.517 Main_Canal_031 M05600 M05700 633.83 45.517 Main_Canal_032 M05700 M05900 394.28 45.517 Main_Canal_033 NODE_125 M06000 349.47 45.517

Link Start End Length Diameter
ID Node Node ft in --
Main_Canal_034 M06000 M06100 125.71 45.517 Main_Canal_036 M06100 C01100_2 387.31 45.517 Main_Canal_037aM06200 MC_WB_US 37.66 66 Main_Canal_037bMC_WB_DS C01000 0.01 66 Dukes_Valley_Pipeline_002aC01000 EFID_088 0.02 29.91 Main_Canal_039 M04200_2 M04300 125.83 45.517 Main_Canal_041 NODE_114 M03100 82.83 45.517 Main_Canal_042 M03100 M03200 132.27 45.517 Main_Canal_043 M03200 M03300 368.93 45.517 Main_Canal_044 M03300 M03400 64.65 45.517 Main_Canal_045 M03400 M03500 420.64 45.517 Main_Canal_046 M04000 M04100 972.23 45.517 Main_Canal_047 M03500 M03600 403.24 45.517 Main_Canal_048 M03700 M03800 426.13 45.517 Main_Canal_049 M03600 M03700 1356.34 45.517 Main_Canal_050 M03800 M03900 120.9 45.517 Main_Canal_051 M03900 M04000 47.07 45.517 Main_Canal_052 EFID_093 M04200_2 130.33 45.517 Main_Canal_053 M04100 EFID_093 321.78 45.517 Main_Canal_054 NODE_022 M02600 1213.32 45.517 Main_Canal_055 M02600 M02700 228.74 45.517 Main_Canal_056 M02700 M02800 354.98 45.517 Main_Canal_057 M02800 M02900 294.3 45.517 Main_Canal_058 M02900 NODE_114 800.6 45.517 Main_Canal_Tavern_Chute_000M05900 M05800 11.34 45.517 Main_Canal_Tavern_Chute_001M05800 NODE_125 58.63 45.517 Marsh/Chamberlin_Line_000DV03900_2 DV03701 15.8 21.58 Marsh/Chamberlin_Line_001DV03701 DV03702 289.05 21.58 Marsh/Chamberlin_Line_002aDV03700 NODE_050 392.48 22.44 Marsh/Chamberlin_Line_003NODE_050 NODE_051 619.11 22.04 Marsh/Chamberlin_Line_004DV04100 DV03704 642.4 16.18 Marsh/Chamberlin_Line_005DV03704 DV03705 225.44 16.18 Marsh/Chamberlin_Line_006DV03705 DV03706 312.92 16.18 Marsh/Chamberlin_Line_007aDV03706 NODE_133 489.1 16.18 Marsh/Chamberlin_Line_008NODE_052 EFID_041 518.68 23.38 Marsh/Chamberlin_Line_009EFID_041 NODE_058 1084.55 23.38 Marsh/Chamberlin_Line_011DV03702 DV03703 178.78 21.58 Marsh/Chamberlin_Line_012DV03703 DV04100 14.03 21.58 Marsh/Chamberlin_Line_013DV04100 EFID_032 5.72 4.05 Marsh/Chamberlin_Line_014NODE_057 DV03900_2 112.53 23.38 Mathieson_Line_000E03800_E03803 US_ML 773.63 3.94 Mathieson_Line_001E03803 E03804 3.99 4.21 Mathieson_Line_002E03802 E03803 2465.2 4.21 Mobile_Home_Line_000C02213 US_MBH1 1111.39 4.53 Mobile_Home_Line_001C02214 EFID_055 273.99 4.21 Mobile_Home_Line_002EFID_055 C02214B 4.57 4.21 Mobile_Home_Line_003C02214 C02214A 520.9 4.21

Link Start End Length Diameter
ID Node Node ft in --
Mud_Alley_Line_000C03911 C03912 5.13 4.05 Mud_Alley_Line_001C03912 C03912a 1027.3 4.05 Mud_Alley_Line_002C03910 C03911 19.05 4.05 Nafsinger_Line_000EFID_006 EFID_005 543.28 4.21 Nafsinger_Line_001E06504 E06505 682.28 4.21 Nafsinger_Line_002E06503 E06504 14.22 4.21 Nafsinger_Line_003E06502 E06503 29.08 4.21 Nafsinger_Line_004EFID_005 E06502 4.08 4.21 Nafsinger_Line_005NODE_300 US_WCP 297.09 3.79 Nafsinger_Line_006E06501 EFID_006

115.47 4.05 Neal_Creek_Lateral_000NODE_005 M06200b 1203.02 4.13
Neal_Creek_Lateral_001C01100_2 NODE_005 277.17 4.13 Neal_Mill_Line_000EFID_050 C04007
534.55 6.19 Neal_Mill_Line_001C04007 C04008 24.79 4.21 Neal_Mill_Line_002C04000 US_NEML
2966.44 7.66 Neal_Mill_Line_003EFID_050 C04002 1307.76 6.19 Neal_Mill_Line_004C04004
C04005 11.98 4.21 Neal_Mill_Line_005NODE_014 C04004 520.67 4.21 Neal_Mill_Line_006C04002
C04003 378.73 6.19 Neal_Mill_Line_007C04003 NODE_014 905.2 4.21
Neal_Mill_Line_008NODE_014 C04006 615.69 4.21 Neal_Mill_Line_009NODE_013 C04001 713.03
4.21 Neal_Mill_Line_010NODE_013 EFID_050 271.25 8.06 Neufeldt_Line_000aC03601A NFL_US
1719.38 5.8 Neufeldt_Line_001NODE_204 C03601B_2 873.72 5.96 Nunamaker_Line_000C03500
C03501_2 4.52 9.87 Nunamaker_Line_001aC03501_2 NML_US 1384.27 8.68
Nunamaker_Line_002C03501_1 EFID_065 598.08 7.92 Nunamaker_Line_003EFID_066 C03501_1 7.5
8.06 Nunamaker_Line_004EFID_065 C03503 108.14 7.92 Nunamaker_Line_005C03503 C03504 372.28
7.75 Nunamaker_Line_006C03504 US_NML2 288.27 6.33 Nunamaker_Line_007C03505 EFID_062
1273.21 6.19 Nunamaker_Line_008EFID_062 EFID_061 107.63 6.19 Nunamaker_Line_009EFID_061
C03506 86.22 6.19 Nunamaker_Line_010C03506 EFID_060 448.71 6.19
Nunamaker_Line_011EFID_060 C03507 16.18 6.19 Nunamaker_Line_012C03507 C03508 251.69 6.19
Nunamaker_Line_013C03508 C03509 327.03 4.94 Nunamaker_Line_014C03509 C03510 210.11 4.94
Nunamaker_Line_015C03510 C03511 247.44 4.13 Nunamaker_Line_016C03511 C03512 120.3 4.13
Nunamaker_Line_017NODE_104 C03519 8.35 4.13 Nunamaker_Line_018C03516 C03517 217.97 4.13
Nunamaker_Line_019C03515 C03516 541.11 4.13 Nunamaker_Line_020C03512 EFID_056 184.03 4.13
Nunamaker_Line_021EFID_056 C03513 13.05 4.13

 Link - Node Table: (continued) ---
Link Start End Length Diameter
ID Node Node ft in ---
Nunamaker_Line_022C03513 C03514 332.89 4.13 Nunamaker_Line_023C03514 C03515 116.38 4.13
Nunamaker_Line_024C03517 NODE_104 17.28 4.13 Nunamaker_Line_025C03519 C03520 1628.41 4.05
Nunamaker_Line_026NODE_104 C03518 183.53 4.13 Nunamaker_Line_027EFID_066 C03502 62.98
4.21 Oanna_000a C03300 O_US_2 1008.02 31.98
Oanna_000b O_DS_2 EFID_078 0.01 31.78
Oanna_001 EFID_078 C03400 2015.28 29.91 Oanna_002 C03400 EFID_071 1294.22 29.91
Oanna_003 EFID_071 C03301 713.53 31.23
Oanna_004 C03301 EFID_070 0.17 31.23
Oanna_006 C03500 EFID_068 1116.77 28.73
Oanna_007 EFID_068 EFID_067 4.04 28.73
Oanna_008 EFID_067 C03302A 9.55 7.75
Oanna_009b C03600_1 O_US_3 2660.66 26.98
Oanna_010 C03302A C03302B 0.41 5.96
Oanna_011a C03600_1 O_US_1 0.2 5.96
Oanna_012 C03600_2 C03601A 1519.81 5.96
Oanna_013 EFID_067 C03600_1 18.03 28.73 Omori_Line_001 C04901D C04901A 1.72 10.05
Omori_Line_002 C04901A C04901DA 729.82 6.08 Omori_Line_003 C04901DA C04901DB 845.25 6.08
Omori_Line_004 C04901DB C04901DD 120.68 4.13 Omori_Line_005 C04901DD C04901DC 5.86 4.13
Paasch_Line_000E05800 PL2_US 1078.21 9.06 Paasch_Line_001E05802_C_2 E05802_C_1 5.19 5.96
Paasch_Line_002E05802_A E05802_C_2 1345.38 7.75 Paasch_Line_003E05801_2 E05801_1 200.24
10.05 Paasch_Line_005E05802 E05802_A 1109.47 9.66 Poole_Line_000 NODE_131 DV04700 5.38
5.96 Poole_Line_001 DV04700 US_POL 687.68 5.8 Poole_Line_002 DV04701 DV04702 1828.27 4.05
Poole_Line_003 DV04702 DV04703 419.93 4.05 Rasmussen_Line_001E03301_AB E03301A 0.28 12.86
Rasmussen_Line_002E03301A NODE_001 607.43 12.59 Rasmussen_Line_003aNODE_001 RRL_US 942.23
11.3 Rasmussen_Line_004E03303 E03304 1342.53 10.05 Rasmussen_Line_005E03304 E03318_1 4.17
8.06 Rasmussen_Line_007E03318_1 EFID_040 1304.56 7.92 Rasmussen_Line_008EFID_040 NODE_136
4.08 7.92 Rasmussen_Line_009NODE_136 E03325 446.95 4.13 Rasmussen_Line_010E03304 E03305
836.91 6.08 Rasmussen_Line_011E03305 EFID_037 107.66 6.08 Rasmussen_Line_012EFID_037
E03306 260.43 6.08 Rasmussen_Line_013E03306 E03307 47.17 6.08 Rasmussen_Line_014E03307
EFID_036 18.14 6.08

Link - Node Table: (continued) --
Link Start End Length Diameter ID Node Node ft in --- Rasmussen_Line_015EFID_036 EFID_031 551.1 6.08
Rasmussen_Line_016EFID_031 E03308 245.03 6.08 Rasmussen_Line_017E03308 E03309 104.31 6.08
Rasmussen_Line_018E03309 E03310 254.21 6.08 Rasmussen_Line_019E03310 EFID_030 220.41 6.08
Rasmussen_Line_020EFID_030 E03313 286.84 4.13 Rasmussen_Line_021E03313 NODE_043 201.02
4.13 Rasmussen_Line_022NODE_136 E03320 632.13 6.08 Rasmussen_Line_023E03320 E03321 749.3
6.08 Rasmussen_Line_024E03321 E03322 232.74 6.08 Rasmussen_Line_025E03322 E03323 159.94

5.96 Rasmussen_Line_026E03323 EFID_029 820.23 4.05 Rasmussen_Line_027EFID_029 EFID_028
368.14 4.05 Rasmussen_Line_029EFID_028 E03324_1 264.51 4.05 Rasmussen_Line_030E03318_1
E03318_2 1445.66 4.21 Rasmussen_Line_031EFID_030 NODE_044 465.42 4.13
Rasmussen_Line_032E03314 E03315 684.69 4.05 Rasmussen_Line_034E03315 E03316 408.76 4.05
Rasmussen_Line_035E03316 E03317_1 256.8 4.05 Rasmussen_Line_036NODE_044 E03312 44.3 4.13
Rasmussen_Line_037NODE_044 E03311 50.53 4.13 Rasmussen_Line_038NODE_043 E03314 18.02 4.13
Rasmussen_Line_039NODE_001 E03301_B 144.76 5.96 Rasmussen_Line_040E03301_B E03302 1.69
4.83 Rasmussen_Line_041EFID_040 E03319_2 54.65 4.13 Rock_Acres_Line_000DV03900_2
DV03900_1 18.71 7.75 Rock_Acres_Line_001DV03900_1 US_RA 895.5 7.75
Rock_Acres_Line_002DV04000_DV03901DV03902 608.68 6.19 Rock_Acres_Line_003DV03903 DV03904
239.59 6.08 Rock_Acres_Line_004DV03902 DV03903 110.34 6.08 Rock_Acres_Line_005DV03904
DV03906 117.38 6.08 Rock_Acres_Line_006DV03905 DV03907 0.83 4.13
Rock_Acres_Line_007DV03908 NODE_054 5.24 4.13 Rock_Acres_Line_008DV03907 DV03908 62.95
4.13 Rock_Acres_Line_009DV03906 DV03905 0.34 4.13 Rock_Acres_Line_013NODE_054 DV03909AB
71.61 4.13 Shaw_Line_000 C03908 C03909 27.62 4.05 Shaw_Line_003 C03908 C03910 207.36 4.05
Shaw_Line_004 NODE_010 C03903 243.39 4.05 Shaw_Line_005 C03900 C03901 649.78 7.75
Shaw_Line_006 C03902 NODE_010 3.67 5.96 Shaw_Line_007 C03901 C03902 191.06 5.96
Shaw_Line_008 C03905_1 C03906 76.31 5.96 Shaw_Line_009 C03906 C03907 396.56 5.96
Shaw_Line_010 C03907 C03908 25.63 4.05 Shaw_Line_011 NODE_010 EFID_045 38.61 5.96
Shaw_Line_012 C03904 C03905_1 10.7 5.96

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Shaw_Line_013 EFID_045 C03904 427.6 5.96 Sheirbon_Hill_Line_000DV03100 DV03000 5.38 7.75
Sheirbon_Hill_Line_002aDV03000 SHH_US 814.8 7.27 Sheirbon_Hill_Line_003EFID_053 DV03104
856.48 8.06 Sheirbon_Hill_Line_004DV03103 EFID_053 88.63 8.06
Sheirbon_Hill_Line_005DV03102 DV03103 59.27 8.06 Sheirbon_Hill_Line_006DV03104 EFID_052
1873.5 6.19 Sheirbon_Hill_Line_007EFID_052 DV03106A_D 215.69 4.13
Sheirbon_Hill_Line_008EFID_052 DV03105 133.28 4.21 Sheppard_Ditch_000EFID_086 NODE_109
710.92 5.8 Sheppard_Ditch_001NODE_110 DV01104 1466.94 5.96 Sheppard_Ditch_002DV01103
NODE_110 816.75 6.19 Sheppard_Ditch_003NODE_109 US_SHP2 439.66 5.89
Sheppard_Line_000bDS_SHP E06703B 1425.49 4.21 Sherrard_Road_Line_000EFID_077 C05400
2719.84 4.05 Shute_Road_Line_000DV05000_2 DV05000_1 6.41 6.19
Shute_Road_Line_001DV05000_1 DV05001 1165.15 5.96 Shute_Road_Line_002DV05001 DV05002
41.71 5.96 Shute_Road_Line_003DV05002 DV05003 109.87 6.08 Shute_Road_Line_004DV05003
DV05005 798.56 6.08 Shute_Road_Line_005DV05005 DV05006 723.36 6.08
Summit_Road_Line_000NODE_072 DV04205 675.13 4.21 Summit_Road_Line_001NODE_074
DV04209A_DV04209B 84.53 4.21 Summit_Road_Line_002Summit_Road_LineNODE_071 1280.72 8.06
Summit_Road_Line_003NODE_077 DV04300 3.65 4.21 Summit_Road_Line_004DV04300 DV04400
1131.89 4.13 Summit_Road_Line_005NODE_077 NODE_137 80.47 4.21
Summit_Road_Line_006NODE_071 DV04201 3.66 8.06 Summit_Road_Line_007DV04202
DV04203_DV04204 424.13 8.06 Summit_Road_Line_008DV04203_DV04204DV04206 565.06 6.19
Summit_Road_Line_009EFID_038 DV04202 17.9 8.06 Summit_Road_Line_010DV04201 EFID_038
163.22 8.06 Summit_Road_Line_011DV04206 NODE_072 193.75 6.19 Summit_Road_Line_012NODE_072
DV04207_DV04208 3.64 6.19 Summit_Road_Line_013DV04207_DV04208NODE_074 847.03 6.19
Summit_Road_Line_014NODE_074 DV04210 479 6.19 Summit_Road_Line_015DV04210 DV04211 0.41
6.19 Summit_Road_Line_016DV04211 NODE_077 291.63 4.21 Sweet_Line_000 EFID_051 DV03801
1575.68 4.13 Sweet_Line_001 EFID_051 NODE_123 570.1 6.19 Sweet_Line_002 NODE_123 DV03804
75.75 4.21 Sweet_Line_003 DV03804 DV03803 4.15 4.21 Sweet_Line_004 NODE_050 DV03800 22.68
6.19 Sweet_Line_005 DV03800 EFID_051 131.38 6.19 Sweet_Line_006 NODE_123 DV03802 19.49
4.21 Sweet_Line_007 DV03802 DV03805 22.97 4.21 Tallman_Line_000aNODE_024 TLL_US 864.98
3.79

Link - Node Table: (continued) --

Link Start End Length Diameter
ID Node Node ft in --
Thomsen_Line_000E06300 US_TL2 1196.48 8.68 Thomsen_Line_001aEFID_008 TL_US 684.12 10.05
Thomsen_Line_002E06301_1 E06304 2963.3 4.83 Thomsen_Line_003E06304 E06301_2 1182.73 4.05
Thomsen_Line_006E06301_1 E06302 2.71 8.06 Thomsen_Line_007E06302 E06303 0.37 4.21
Tiffany_Line_000aNODE_026 TFL_US 1038.94 3.94 Webb_Drive_Line_000NODE_069 DV04806 87.89
4.13 Webb_Drive_Line_001DV04806 DV04807 111.03 4.13 Webb_Drive_Line_002DV04810 DV04811
66.17 4.05 Webb_Drive_Line_003DV04809 DV04810 483.22 4.05 Webb_Drive_Line_004DV04807

DV04808 74.64 4.13 Webb_Drive_Line_005DV04808 DV04809 44.85 4.13
Webb_Drive_Line_006NODE_067 DV04801 231.58 4.13 Webb_Drive_Line_007DV04802 DV04803 148.78
4.21 Webb_Drive_Line_008DV04801 DV04802 204 4.13 Webb_Drive_Line_009NODE_069 DV04805
254.2 4.13 Webb_Drive_Line_010DV04804 NODE_067 232.54 4.13 Webb_Drive_Line_011NODE_134
DV04804 5.26 4.94 Webb_Drive_Line_012NODE_067 NODE_069 460.67 4.13
Webster_Pressure_Line_000C04100 C04100A 1350.5 10.05 Webster_Pressure_Line_001C04100A
EFID_013 1370.87 5.96 Webster_Pressure_Line_002EFID_013 C04100D 1121.93 4.05
Webster_Pressure_Line_003C04100A C04100B 1379.74 5.96 Webster_Pressure_Line_004EFID_013
C04100C 260.69 4.94 Webster_Pressure_Line_005EFID_020 C04100 9.26 10.05
Wheeler_Road_Line_000DV04004 DV04003 1029.02 4.05 Wheeler_Road_Line_001DV04003 DV04005
33.59 4.05 Wheeler_Road_Line_002DV04001 DV04002 123.3 6.08 Wheeler_Road_Line_003DV04002
DV04004 16.12 4.13 Wheeler_Road_Line_004DV04000_DV03901DV04001 354.69 6.19
Whiskey_Creek_Pipeline_001E06613 NODE_320 771.17 11.3 Whiskey_Creek_Pipeline_002NODE_320
US_WCP4 534.35 11.33 Whiskey_Creek_Pipeline_003E06615_E06614 E06616 42.08 10.05
Whiskey_Creek_Pipeline_004E06616 EFID_002 34.46 10.05 Whiskey_Creek_Pipeline_005EFID_002
NODE_139 764.62 9.87 Whiskey_Creek_Pipeline_006E06500 E06601_A 1519.18 7.75
Whiskey_Creek_Pipeline_007E06601_A E06602 406.39 7.75 Whiskey_Creek_Pipeline_009E06602
EFID_004 87.26 7.75 Whiskey_Creek_Pipeline_010EFID_004 E06603 230.25 7.75
Whiskey_Creek_Pipeline_012NODE_139 E06618 1468.53 7.92 Whiskey_Creek_Pipeline_013E06618
E06619 557.41 8.06 Whiskey_Creek_Pipeline_014E06619 US_LHP2 1115.56 7.66
Whiskey_Creek_Pipeline_015E06620 EFID_001 498.58 8.06 Whiskey_Creek_Pipeline_016aEFID_007
NODE_300 285.66 16.86 Whiskey_Creek_Pipeline_017NODE_330 E06607 780.93 14.38
Whiskey_Creek_Pipeline_018E06606 E06608 477.84 14.38

Link - Node Table: (continued) ---
Link Start End Length Diameter
ID Node Node ft in ---
Whiskey_Creek_Pipeline_019E06607 E06606 860.96 14.38 Whiskey_Creek_Pipeline_020E06608
EFID_098 387.57 12.59 Whiskey_Creek_Pipeline_021EFID_098 E06610 23.12 11.46
Whiskey_Creek_Pipeline_022E06610 EFID_003 21.28 11.46 Whiskey_Creek_Pipeline_023EFID_003
E06611 35.06 11.46 Whitesell_East_000C03905_1 C03905_2 682.15 4.05
Whitesell_West_000C03911 C03911a 583.36 4.05 Winklebleck_Line_000C01200 US_WLB3 1007.27
7.75 Winklebleck_Line_001aC01201 WL_US 1380.26 7.55 Winklebleck_Line_002C01202 C01203
568.39 8.06 Winklebleck_Line_003C01203 C01204 472.87 6.08 Winklebleck_Line_004C01204
C01205 323.93 5.96 Winklebleck_Line_005C01205 C01205A 5.15 5.96
Winklebleck_Line_006C01205A C01205B 245.54 4.05 Winklebleck_Line_007C01205B US_WBL4 943.2
3.88 Wy'east_Road_Line_000DV04400 DV04401_DV04402 227.28 4.13
Wy'east_Road_Line_001DV04403 DV04404 539.17 4.13
Wy'east_Road_Line_002DV04401_DV04402DV04403 151.9 4.13 Yasui_Line_000 EFID_078 C03400A
3617.1 7.92 Yasui_Line_001 C03400A C03400C 998.72 8.06 Yasui_Line_002 C03400B C03400D
467.83 6.19 Yasui_Line_003 C03400C C03400B 151.22 6.19 Lower_Highline_Pressure_004aE06621
E06702A_1 1766.44 5.96 Lower_Highline_Pressure_028bLHP_DS_2 E06705B 2.21 4.21
Thomsen_Line_001bTL_DS E06301_1 0.01 10.05 Kellly_Line_000bKL_DS EFID_009 1.32 4.21
Paasch_Line_004bPL_DS E05802 36.1 10.05 Eastside_Canal_024aE05300 E05500 396.19 23.88
Dethman/Swyers_Line_000bDSL_DS NODE_035 0.79 10.05 Rasmussen_Line_000aE03300 E03301_AB
886.53 12.86 Rasmussen_Line_003bRRL_DS E03303 1.46 11.92 Allison_Line_001bAL_DS C04901D
8.95 10.05
Oanna_005a EFID_070 C03500 1252.99 31.23 Nunamaker_Line_001bNML_DS EFID_066 0.21 8.06
Neufeldt_Line_000bNFL_DS NODE_204 6.77 6.19 Oanna_009a O_DS_3 C03700 1.86 28.04
Bietler_Line_002bBL_DS EFID_076 7.8 6.19 Winklebleck_Line_001bWL_DS C01202 25.62 8.06
Cherry_Hill_Line_002bCHH_DS DV02501_DV02502_DV02503 23.34 4.05
Sheirbon_Hill_Line_002bSHH_DS DV03102 12.66 8.06 Panorama_Point_Line_000NODE_045 E06612
9.15 4.21 Whiskey_Creek_Pipeline_024E06611 E06613 1304.14 11.46 Lariza_Line_000cNODE_045
E06609_B 546.81 6.19 Lariza_Line_000bDS_LRL NODE_045 1 6.19 Sheppard_Line_000aNODE_025
US_SHP 0.01 3.88 Tiffany_Line_000bTFL_DS E06702B_2 1.07 4.21 Tallman_Line_000bTLL_DS
E02600 3.46 4.21

Link - Node Table: (continued) ---
Link Start End Length Diameter
ID Node Node ft in ---
Dethman_Ridge_Line_001bNODE_132 DRL_US 0.11 27.45 Oanna_011b O_DS_1 C03600_2 0.26 6.19
Thomsen_Line_001cTL_US TL_DS 1 10.05 Paasch_Line_004aE05801_1 PL_US 349.78 10.05
Paasch_Line_004cPL_US PL_DS 1 10.05 Crag_Rat_Line_002cCR_US_1 CR_DS_1 1 7.75

Neal_Mill_Line_002bDS_NEML NODE_013 1 8.06 Dethman_Ridge_Line_061bDS_DRL3 EFID_020 1 11.92 Bietler_line_002cBL_US BL_DS 1 6.19 Cherry_Hill_Line_002cCHH_US CHH_DS 1 4.05
Whiskey_Creek_Pipeline_006bNODE_300 NODE_330 4202.3 13.81
Whiskey_Creek_Pipeline_10bE06603 E06604 969.3370796 8.06
Central_Lateral_Pipeline_001bNODE_203 C01200 3203.11 72
Central_Lateral_Pipeline_001cC01200 C01300 1328.14 72 Whiskey_Creek_Pipeline_10cE06604 E06605 990.42 6.19 Main_Canal_Combine_000aReservoir_1 M04400 29186.83 51.208 Main_Canal_Combine_000bM04400 US_MC 4074.1 51.208 Main_Canal_035 C01100_2 M06200 10 45.217
V_LHP_2 LHP_US_2 LHP_DS_2 #N/A 6 Valve
V_LL_1 LL_US_1 LL_DS_1 #N/A 16 Valve V_SR_WB SR_WB_US SR_WB_DS #N/A 30 Valve V_EA_WB EA_WB_US EA_WB_DS #N/A 30 Valve V_CHL_2 CHL_US_2 NODE_007 #N/A 18 Valve V_CHL_1 CHL_US_1 CHL_DS_1 #N/A 10 Valve V_MC_WB MC_WB_US MC_WB_DS #N/A 66 Valve V_CP_WB_2 CP_WB_US_2 CP_WB_DS_2 #N/A 12 Valve V_DVP_1 DVP_US_1 DVP_DS_1 #N/A 30 Valve V_MCL_1 MCL_US_1 NODE_055 #N/A 22 Valve V_GL_1 GL_US_1 GL_DS_1 #N/A 6 Valve
V_KL KL_US KL_DS #N/A 4 Valve
V_DSL DSL_US DSL_DS #N/A 10 Valve
V_RRL RRL_US RRL_DS #N/A 12 Valve
V_O_2 O_US_2 O_DS_2 #N/A 28 Valve
V_O_3 O_US_3 O_DS_3 #N/A 30 Valve
V_NFL NFL_US NFL_DS #N/A 6 Valve
V_NML NML_US NML_DS #N/A 8 Valve
V_AL AL_US AL_DS #N/A 10 Valve
V_WL WL_US WL_DS #N/A 6 Valve
V_SHH SHH_US SHH_DS #N/A 8 Valve
V_O_1 O_US_1 O_DS_1 #N/A 6 Valve
V_LRL US_LRL DS_LRL #N/A 6 Valve V_TFL TFL_US TFL_DS #N/A 4 Valve
V_TLL TLL_US TLL_DS #N/A 4 Valve
V_DRL DRL_US DRL_DS #N/A 24 Valve
V_SHP US_SHP DS_SHP #N/A 4 Valve
V_WCP US_WCP E06501 #N/A 4 Valve
V_LHP E06702A_1 E06702B_1 #N/A 6 Valve

Link - Node Table: (continued) --
Link Start End Length Diameter
ID Node Node ft in --
V_HUL E06617 NODE_031 #N/A 6 Valve
V_TL US_TL2 EFID_008 #N/A 10 Valve V_PL2 PL2_US E05801_2 #N/A 10 Valve
V_CR2 US_CR2 E04104 #N/A 6 Valve
V_CR3 EFID_022 NODE_042 #N/A 4 Valve
V_ML US_ML E03802 #N/A 4 Valve
V_NML2 US_NML2 C03505 #N/A 6 Valve
V_NEML US_NEML DS_NEML #N/A 8 Valve
V_DRL2 US_DRL2 C03737 #N/A 6 Valve
V_DRL3 US_DRL3 DS_DRL3 #N/A 12 Valve
V_BL2 US_BL2 C01701 #N/A 6 Valve
V_GL3 US_GL3 EFID_074 #N/A 4 Valve
V_WLB3 US_WLB3 C01201 #N/A 8 Valve
V_WBL4 US_WBL4 C01205C #N/A 4 Valve
V_CH3 US_CH3 DV01101 #N/A 8 Valve V_BUL3 US_BL3 C02218B #N/A 4 Valve
V_MBH1 US_MBH1 C02214 #N/A 12 Valve
V_DV3 US_DV3 DV03700 #N/A 16 Valve
V_CRLO US_CRLO DV05008 #N/A 6 Valve
V_POL US_POL DV04701 #N/A 6 Valve
V_RA US_RA DV04000_DV03901 #N/A 8 Valve
V_ACH US_ACH Summit_Road_Line #N/A 16 Valve
V_FS US_FS EFID_089 #N/A 4 Valve
V_CHL3 US_CHL3 EFID_058 #N/A 4 Valve
V_SHP2 US_SHP2 DV01103 #N/A 6 Valve
V_CLP US_CLP EFID_085 #N/A 30 Valve
V_CLP2 US_CLP2 C05300 #N/A 8 Valve
V_WCP2 NODE_300 E06500 #N/A 14 Valve V_WCP3 NODE_320 E06614 #N/A 4 Valve
V_LHP2 US_LHP2 E06620 #N/A 8 Valve
V_WCP4 US_WCP4 E06615_E06614 #N/A 12 Valve
V_MC US_MC M06200 #N/A 48 Valve

Node Results: --
Node Demand Head Pressure Quality
ID GPM ft psi --
E06707AB 53.00 539.30 83.13 0.00
E06707C 41.32 539.72 77.34 0.00
E06707E 24.23 540.90 67.16 0.00
E06707A 5.70 541.12 28.35 0.00
E06707D 9.11 541.06 30.89 0.00
NODE_027 0.00 541.09 28.89 0.00
E06706 7.41 544.83 26.73 0.00 E06705A 3.99 552.77 6.34 0.00
E06705B_2 4.85 549.45 10.27 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
E06705CD 54.71 552.73 6.20 0.00
E06705B 11.68 559.97 14.98 0.00
E06704 16.82 827.65 85.03 0.00
E06703B 110.59 598.23 35.98 0.00
E06703A 23.93 827.81 74.38 0.00
NODE_025 0.00 827.80 74.38 0.00
E06702B_1 0.00 833.14 40.00 0.00
E06702A_1 34.20 896.41 67.41 0.00 E06700 0.00 922.56 33.66 0.00
E06621 178.41 922.05 31.40 0.00
EFID_001 0.00 922.71 36.30 0.00
E06702B_2 11.68 657.51 40.02 0.00
NODE_026 0.00 833.13 40.14 0.00
E06620 57.00 925.90 70.00 0.00
E06702A 0.00 833.08 65.67 0.00
E06702A_2 9.69 833.04 83.81 0.00
E06619 41.03 957.21 28.22 0.00
E06618 11.40 961.93 50.13 0.00
E06617B 100.89 854.18 68.86 0.00
E06617 0.00 965.77 86.07 0.00
NODE_139 0.00 975.89 53.91 0.00
NODE_031 0.00 858.46 40.00 0.00
E06617A 102.60 849.58 85.69 0.00
EFID_002 0.00 979.85 50.05 0.00
E06616 262.77 980.02 48.32 0.00 E06615_E06614 75.81 980.33 50.08 0.00
NODE_320 0.00 982.87 107.86 0.00
E06613 140.21 986.86 36.93 0.00
E06609_B 380.19 749.13 36.29 0.00
E06609_A 5.70 749.13 37.32 0.00
E06612 28.50 754.70 39.49 0.00
E06611 6.16 994.49 49.52 0.00
NODE_045 0.00 754.70 40.03 0.00
EFID_003 0.00 994.69 49.59 0.00
E06610 51.87 994.82 49.70 0.00
E06608 105.44 997.38 50.09 0.00
EFID_098 0.00 994.96 49.80 0.00
E06606 5.70 999.11 50.35 0.00
E06607 84.93 1002.23 49.65 0.00
E06605 390.44 853.12 26.97 0.00
E06604 88.34 863.43 50.87 0.00
E06603 25.09 867.50 86.14 0.00 EFID_004 0.00 868.79 82.24 0.00
E06602 141.37 869.28 82.74 0.00
E06505 11.40 971.28 33.36 0.00
EFID_005 0.00 971.36 32.48 0.00
E06502 8.56 971.36 32.19 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --

E06503 5.70 971.35 32.60 0.00
E06504 5.70 971.35 32.67 0.00
E06304 106.59 716.95 80.88 0.00
E06301_2 99.19 709.27 79.50 0.00
E06601_A 13.69 872.86 86.29 0.00 EFID_006 0.00 971.71 97.03 0.00
E06501 95.77 971.80 95.00 0.00
EFID_007 0.00 1026.23 64.59 0.00
E06500 0.00 886.81 50.00 0.00
EFID_008 0.00 751.41 20.00 0.00
E06301_1 0.00 748.49 40.43 0.00
E06302 503.89 748.47 40.61 0.00
E06303 151.61 748.47 40.61 0.00
E06300 0.00 1027.42 42.33 0.00
E06200 137.93 1028.98 48.35 0.00
E06100 128.81 1029.52 48.47 0.00
EFID_009 0.00 766.30 40.03 0.00
E06000_1 142.78 749.18 62.63 0.00
E06000_2 0.00 1030.22 47.70 0.00
NODE_034 0.00 1030.22 47.70 0.00
E05900 347.13 1030.75 48.54 0.00
E04920_A 99.19 732.22 71.10 0.00 E04920_B 98.03 731.94 72.28 0.00
E04921 36.49 747.42 69.95 0.00
E04918 1.13 736.38 69.91 0.00
EFID_101 0.00 747.72 69.86 0.00
E05802 0.00 829.92 46.97 0.00
E05801_1 111.44 831.37 28.39 0.00
E05800 0.00 1033.10 49.02 0.00
E05700 82.09 1033.33 49.46 0.00
E04917 143.63 736.38 69.33 0.00
E04920_C 0.57 746.86 69.57 0.00
E05801_2 58.13 832.32 20.00 0.00
E05802_A 189.23 824.90 81.89 0.00
E05802_C_1 407.56 814.02 90.39 0.00
E05802_C_2 205.77 814.09 90.51 0.00
E05500_F 93.49 754.17 46.65 0.00
E05600 486.79 1035.46 50.05 0.00
E05500_CDE 336.30 755.66 43.10 0.00 E05500 0.00 1037.48 50.36 0.00
E04919_AB 208.91 756.80 66.87 0.00
NODE_035 0.00 759.91 40.02 0.00
EFID_102 0.00 761.40 65.42 0.00
EFID_103 0.00 759.95 64.11 0.00
E04916 396.16 760.11 64.06 0.00
E05400 181.27 1038.68 50.95 0.00
E05300 296.40 1038.65 50.94 0.00

Node Results: (continued) ---

Node Demand Head Pressure Quality
ID GPM ft psi --
E05500_AB 397.01 756.45 37.67 0.00
E04915 1.13 763.22 63.63 0.00 E05200 117.14 1040.56 51.34 0.00
E04914 110.59 767.19 61.11 0.00
E04913 156.19 769.29 60.91 0.00
E04912 100.89 770.05 60.11 0.00
EFID_010 0.00 770.29 60.06 0.00
E05100 286.13 1044.10 51.41 0.00
E05000 78.09 1045.58 52.27 0.00
E04911 117.14 770.21 52.40 0.00
E04900 0.00 1046.62 52.45 0.00
EFID_011 0.00 777.63 60.50 0.00
E04905 123.69 784.33 50.03 0.00
EFID_096 0.00 1046.62 52.45 0.00
NODE_039 0.00 783.58 59.11 0.00
E04907_2 176.42 780.56 63.72 0.00
E04906 10.55 783.57 58.63 0.00
E04908_1 113.72 769.25 57.42 0.00
EFID_104 0.00 770.72 52.47 0.00 E04910 752.12 771.55 53.12 0.00

E04901 54.16 1045.47 58.38 0.00
EFID_012 0.00 792.65 25.21 0.00
E04903A 670.31 1042.31 63.98 0.00
E04903B 805.69 1042.55 60.88 0.00
E04909 112.01 772.00 58.41 0.00
E04902 201.79 1043.11 59.55 0.00
C03746 418.94 841.03 81.72 0.00
E04904 9.11 792.62 38.57 0.00
NODE_040 0.00 774.38 59.95 0.00
E04800 218.03 1048.94 52.99 0.00
E04700 106.01 1049.26 53.10 0.00
E04600 201.79 1049.69 53.43 0.00
E04500 162.46 1050.52 53.43 0.00
C03745 184.69 857.34 77.77 0.00
DV04621 0.00 827.21 67.51 0.00
C03736 597.37 899.24 64.51 0.00 C03734 311.21 899.43 64.14 0.00
C03733 3.99 899.47 63.96 0.00
C03735 1.13 899.36 64.10 0.00
DV04620 206.33 827.24 67.51 0.00
EFID_013 0.00 849.47 71.81 0.00
NODE_064 0.00 827.09 67.72 0.00
DV04621A 2.86 827.08 67.86 0.00
DV04621B 80.37 826.45 67.68 0.00
C03732 48.44 894.02 59.36 0.00
C04100C 210.33 846.88 66.08 0.00
EFID_014 0.00 827.97 67.61 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
E04400 5.70 1051.30 53.29 0.00
E04300_1 77.24 1051.91 53.42 0.00
E04300_2 11.40 1051.85 53.29 0.00
C04100D 125.97 838.12 78.55 0.00
NODE_016 0.00 896.17 48.09 0.00
E04100 0.00 1052.97 53.91 0.00
E04105a 37.04 749.31 48.17 0.00
E04104 0.00 756.04 40.00 0.00
E04105b 25.64 749.31 48.17 0.00
E04104_a 27.93 756.04 39.99 0.00
DV04619 131.67 832.11 67.17 0.00
E04101 253.09 1036.17 50.85 0.00
DV04618 86.07 832.28 67.23 0.00
EFID_015 0.00 895.91 47.95 0.00
C03730 190.94 895.72 47.70 0.00 EFID_016 0.00 903.59 59.78 0.00
C03744 112.01 863.99 63.40 0.00
EFID_017 0.00 903.95 58.92 0.00
E04200 324.90 1052.93 53.60 0.00
E04105 197.21 749.93 48.21 0.00
E04104_b 5.70 756.04 40.02 0.00
NODE_015 0.00 896.19 48.34 0.00
NODE_041 0.00 1036.15 50.94 0.00
C03731 129.97 886.93 50.26 0.00
C03729 106.59 904.17 58.38 0.00
DV04703 91.20 805.89 77.54 0.00
DV04702 81.51 808.23 70.87 0.00
C03743 112.58 867.85 49.64 0.00
EFID_100 0.00 865.42 58.80 0.00
E04000 11.40 1054.08 53.84 0.00
DV04609 160.17 852.61 39.42 0.00
DV04608 200.63 852.64 38.81 0.00 DV04616 141.93 840.80 61.74 0.00
EFID_018 0.00 839.31 65.57 0.00
EFID_019 0.00 836.98 70.42 0.00
DV04615 26.21 841.21 61.26 0.00
DV04614 28.50 841.42 60.55 0.00
E04103B 23.93 849.95 90.64 0.00

E04103A_1 102.03 850.25 91.86 0.00
EFID_020 0.00 868.91 40.03 0.00
C04100 0.00 868.86 39.80 0.00
C04100B 324.90 850.20 73.96 0.00
C04100A 249.95 862.49 58.37 0.00
NODE_059 0.00 852.85 39.14 0.00
DV04602 67.83 867.54 44.17 0.00
DV04617 7.99 836.94 72.89 0.00
EFID_022 0.00 995.88 77.51 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi ---
E03900 284.43 1054.61 53.49 0.00
E03800_E03803 0.00 1054.94 53.70 0.00
E03801 348.27 1054.94 53.70 0.00
C03742 5.13 918.01 53.90 0.00
NODE_042 0.00 862.11 20.00 0.00
E03317_1 3.41 795.56 67.12 0.00
DV04701 129.68 841.41 10.00 0.00
E04103A_2 53.01 860.25 77.57 0.00
DV04611 28.50 850.94 49.89 0.00
DV04610 115.43 858.47 31.71 0.00
DV04612 27.37 850.27 50.60 0.00
DV04613 33.07 847.27 60.75 0.00 EFID_023 0.00 847.33 60.58 0.00
C03728 84.93 909.93 44.19 0.00
C03741 395.59 918.58 55.59 0.00
C03727 282.71 910.28 43.33 0.00
DV04607 98.33 860.44 32.55 0.00
E03316 13.11 795.56 65.56 0.00
DV04808 25.64 831.69 58.86 0.00
DV04806 5.70 833.95 59.08 0.00
DV04807 5.70 832.56 59.19 0.00
DV04809 5.70 831.33 59.44 0.00
DV04801 15.39 842.03 60.09 0.00
DV04802 8.56 842.00 51.77 0.00
DV04811 80.93 827.12 62.12 0.00
C03740 25.64 789.56 32.55 0.00
DV04805 11.40 835.10 60.31 0.00
DV04803 5.70 842.00 48.66 0.00
DV04804 14.81 847.01 60.41 0.00 NODE_060 0.00 858.88 30.07 0.00
NODE_067 0.00 842.18 56.87 0.00
NODE_069 0.00 835.13 59.21 0.00
NODE_134 0.00 847.06 60.52 0.00
NODE_056 0.00 870.92 10.05 0.00
DV04810 30.79 827.41 61.46 0.00
C03726 85.50 911.44 40.68 0.00
E03311 49.59 798.65 59.97 0.00
E03312 54.44 798.65 61.05 0.00
E03802 57.57 970.48 60.00 0.00
E03315 55.58 795.65 66.47 0.00
C03738_C03739 60.14 789.60 39.46 0.00
DV04005 35.91 962.84 82.02 0.00
DV04700 0.00 1074.56 85.09 0.00
DV04601 138.51 1074.34 85.56 0.00
DV04003 2.86 962.87 81.54 0.00
DV04603 213.19 1073.22 87.36 0.00 DV04604 215.47 866.53 26.19 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi ---
DV04605 264.49 866.33 25.91 0.00
EFID_024 0.00 862.27 35.64 0.00

DV05006 5.70 1056.78 55.49 0.00
DV05007 1.13 1050.14 70.72 0.00
DV05008 112.29 969.53 40.00 0.00
DV05009 112.29 949.42 57.20 0.00
DV04606 105.74 857.90 44.23 0.00
DV05010 53.01 945.55 60.25 0.00
EFID_026 0.00 920.90 53.42 0.00 C03725 218.89 913.09 36.52 0.00
EFID_027 0.00 920.91 53.44 0.00
C03724 378.19 920.92 53.30 0.00
NODE_044 0.00 798.73 60.65 0.00
NODE_055 0.00 870.95 10.00 0.00
NODE_131 0.00 1074.60 84.78 0.00
NODE_133 0.00 1076.06 77.25 0.00
C03737 159.60 790.87 40.00 0.00
EFID_028 0.00 771.24 57.05 0.00
E03324_1 178.41 766.14 69.05 0.00
E03314 25.09 798.12 61.55 0.00
E03313 21.67 799.37 60.67 0.00
EFID_029 0.00 778.33 56.43 0.00
EFID_030 0.00 801.73 59.55 0.00
DV03706 80.93 1077.99 76.89 0.00
E03803 5.70 970.30 55.00 0.00
E03804 3.99 970.30 55.49 0.00 E03310 9.11 802.62 60.89 0.00
C03723 108.58 921.59 51.89 0.00
NODE_043 0.00 798.22 61.35 0.00
DV03705 5.70 1079.29 77.50 0.00
DV05005 88.91 1061.35 62.35 0.00
E03700 25.64 1056.95 52.88 0.00
E03309 17.10 803.72 62.75 0.00
DV03704 133.96 1080.23 77.34 0.00
DV04534 173.84 859.37 28.71 0.00
E03308 9.69 804.24 64.03 0.00
DV04533 305.51 868.90 45.80 0.00
DV04004 139.64 964.05 65.01 0.00
DV04002 94.91 964.33 64.37 0.00
E03323 113.43 794.14 64.51 0.00
EFID_031 0.00 805.54 58.20 0.00
E03600 536.37 1057.89 53.96 0.00
DV04001 1.71 965.05 60.46 0.00 E03322 61.57 795.31 59.77 0.00
DV04527 2.29 875.75 52.18 0.00
C04005 142.50 740.92 37.47 0.00
E03321 5.70 797.51 59.13 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
DV03906 17.10 962.77 67.16 0.00
DV03907 119.42 962.74 67.15 0.00
DV04100 0.00 1083.13 78.71 0.00
DV03908 9.11 962.49 67.44 0.00
DV03909AB 71.26 962.24 67.35 0.00
DV03703 11.40 1083.17 78.85 0.00 DV03905 3.99 962.76 67.16 0.00
DV03904 4.57 963.23 66.62 0.00
EFID_032 0.00 1083.13 78.77 0.00
DV03902 0.57 964.67 59.90 0.00
DV03903 0.57 964.22 62.83 0.00
DV04501 186.68 893.67 13.98 0.00
Summit_Road_Line 0.00 897.81 15.00 0.00
EFID_033 0.00 888.23 36.97 0.00
DV04503 218.89 891.94 21.72 0.00
DV04504 58.43 891.85 22.05 0.00
DV04505 108.30 884.92 44.38 0.00
DV04530 1.71 872.93 45.44 0.00
DV04532 2.86 870.94 47.43 0.00
C03721 91.20 906.07 24.74 0.00
C03722 2.86 906.08 24.81 0.00

C03719 112.58 913.88 28.85 0.00
EFID_034 0.00 923.67 43.52 0.00 EFID_035 0.00 913.91 28.87 0.00
C03720_C03720a 116.29 906.04 24.33 0.00
C04004 2.29 741.05 37.47 0.00
DV05003 3.41 1069.70 66.29 0.00
DV04000_DV03901 0.57 966.98 40.00 0.00
C04006 21.67 746.49 47.06 0.00
C03717_C03718 5.42 913.79 29.82 0.00
C03716 47.59 913.76 29.72 0.00
DV03702 5.70 1083.69 77.39 0.00
DV05002 0.57 1070.87 71.49 0.00
EFID_036 0.00 808.46 56.16 0.00
DV05001 2.86 1071.36 72.87 0.00
E03307 135.38 808.56 56.30 0.00
E03306 14.24 809.10 56.09 0.00
DV04506 7.13 878.51 58.59 0.00
DV04507 17.10 877.20 55.53 0.00
DV04529 38.19 876.37 53.44 0.00 DV04528 9.11 873.33 45.95 0.00
DV04531 4.28 871.70 46.59 0.00
NODE_014 0.00 746.69 39.16 0.00
NODE_054 0.00 962.47 67.43 0.00
DV04502 3.14 897.71 15.01 0.00
NODE_093 0.00 870.97 47.36 0.00
DV04547_DV04546 4.57 855.99 74.78 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
NODE_122 0.00 906.08 24.74 0.00
NODE_130 0.00 913.91 28.87 0.00
DV03701 5.70 1084.53 77.59 0.00 DV03900_1 0.00 1084.47 77.92 0.00
DV03900_2 0.00 1084.57 77.80 0.00
E03500 141.93 1058.93 54.09 0.00
EFID_037 0.00 812.32 56.19 0.00
DV04537 41.61 857.67 49.47 0.00
E03305 15.97 813.65 56.57 0.00
DV04536 3.14 861.28 47.62 0.00
DV04535 5.70 863.61 48.43 0.00
DV04543 42.74 856.18 52.25 0.00
Hernandez_Line 0.00 870.38 58.93 0.00
EFID_106 0.00 869.69 60.56 0.00
DV04509 27.93 869.53 61.33 0.00
DV04510 3.99 869.41 61.99 0.00
DV04523 1.71 868.42 55.87 0.00
NODE_057 0.00 1084.84 77.24 0.00
NODE_058 0.00 1085.10 77.43 0.00
NODE_095 0.00 856.15 52.46 0.00 NODE_096 0.00 856.01 65.04 0.00
DV04545 1.99 856.00 76.89 0.00
DV04508 7.13 870.58 58.62 0.00
C03715 144.49 925.34 68.99 0.00
E03320 77.51 804.80 58.88 0.00
DV04905 51.30 1083.42 13.50 0.00
C04003 222.87 759.39 40.94 0.00
DV04906 2.86 1082.81 16.01 0.00
DV04544B 1.42 856.00 77.45 0.00
DV04511 4.28 869.27 61.04 0.00
DV04512 4.57 868.98 58.07 0.00
DV04513 1.99 868.97 57.97 0.00
DV04514 3.99 868.90 57.59 0.00
DV04519 14.24 868.58 61.68 0.00
DV04522 1.43 868.42 57.36 0.00
DV04521 1.43 868.42 58.46 0.00
DV04520 13.96 868.42 59.39 0.00 DV04524 1.43 868.41 60.84 0.00
NODE_091 0.00 868.60 62.10 0.00
NODE_094 0.00 868.42 59.02 0.00
DV04544A 9.11 855.99 65.48 0.00

NODE_092 0.00 868.59 63.25 0.00
DV04518 21.67 868.47 61.05 0.00
C03714 171.00 926.65 67.04 0.00
DV05000_1 11.40 1085.25 12.89 0.00
DV05000_2 0.00 1085.31 12.48 0.00
E03325 57.00 812.69 57.48 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi --
DV04904A_B 157.31 1085.51 14.75 0.00
DV04201 113.72 888.02 14.53 0.00
EFID_038 0.00 887.14 15.78 0.00
DV04211 96.90 862.71 39.01 0.00
DV04207_DV04208 41.61 874.14 18.13 0.00
DV04300 0.00 857.38 39.86 0.00
DV04210 29.93 862.71 39.01 0.00
C03806 5.13 913.90 31.45 0.00
DV04203_DV04204 62.98 884.93 19.85 0.00
DV04206 4.28 876.89 18.02 0.00
DV04400 0.00 849.12 47.83 0.00
DV03801 29.93 1089.38 67.81 0.00
E03400 62.70 1060.28 53.93 0.00
DV04209A_DV04209B 52.43 865.99 32.65 0.00
DV04303 39.90 856.99 40.31 0.00
C03804 363.38 909.92 51.22 0.00
DV04301 22.23 857.08 39.86 0.00 DV04903 155.03 1085.80 12.06 0.00
EFID_039 0.00 913.90 33.92 0.00
EFID_040 0.00 813.65 61.43 0.00
C04002 2.86 763.32 37.04 0.00
DV04202 21.67 887.05 16.26 0.00
DV04515 5.70 868.81 57.17 0.00
DV04516 26.21 868.81 57.21 0.00
DV04525 3.41 868.40 63.97 0.00
DV04526 3.71 868.40 62.95 0.00
C03805 5.70 913.89 13.05 0.00
NODE_011 0.00 913.90 33.26 0.00
NODE_012 0.00 913.90 32.78 0.00
NODE_071 0.00 888.05 14.51 0.00
NODE_072 0.00 874.18 18.17 0.00
NODE_074 0.00 866.12 33.43 0.00
NODE_075 0.00 857.08 39.74 0.00
NODE_076 0.00 857.02 40.10 0.00 NODE_077 0.00 857.40 39.82 0.00
NODE_137 0.00 857.11 39.72 0.00
NODE_136 0.00 813.63 61.25 0.00
NODE_089 0.00 857.02 40.11 0.00
C03713 143.63 928.30 42.52 0.00
E03304 110.01 824.74 54.56 0.00
C03803 50.17 915.17 37.55 0.00
DV04401_DV04402 57.28 847.46 47.47 0.00
E03303 276.44 835.71 40.00 0.00
EFID_041 0.00 1087.63 82.65 0.00
DV04403 49.01 847.17 47.12 0.00
NODE_001 0.00 1055.29 75.57 0.00
E03301_B 72.39 1054.34 67.57 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality ID GPM ft psi ---
E03302 202.36 1054.32 67.56 0.00
E03319_2 174.41 812.73 59.07 0.00
DV04538_DV04539 26.79 854.95 65.79 0.00
DV04540 4.57 854.95 63.85 0.00

DV0454_DV04542 10.27 854.94 64.73 0.00
E03318_1 0.00 824.71 54.62 0.00
DV04302 18.23 856.58 49.09 0.00
DV04907 448.59 1081.05 23.36 0.00
C03712 183.53 929.50 16.64 0.00
DV04908 0.57 1080.84 25.83 0.00
E03301A 19.94 1058.58 50.12 0.00
E03301_AB 0.00 1058.58 50.12 0.00
NODE_051 0.00 1089.55 63.59 0.00
NODE_052 0.00 1088.84 75.68 0.00 DV04205 45.60 873.32 24.79 0.00
DV04404 4.85 847.16 47.95 0.00
EFID_042 0.00 930.04 5.81 0.00
EFID_043 0.00 925.15 23.18 0.00
C03900 0.00 925.30 24.15 0.00
DV04902 1.13 1087.67 11.64 0.00
C03909 59.86 910.96 80.73 0.00
C04000 0.00 930.41 17.28 0.00
C03907 114.85 911.46 81.25 0.00
C03901 98.03 921.81 79.77 0.00
C03902 45.32 919.36 81.73 0.00
EFID_045 0.00 918.96 81.75 0.00
C03905_1 3.41 914.80 81.79 0.00
C03906 29.63 914.17 81.69 0.00
C03904 8.56 914.89 81.21 0.00
C03711 179.56 930.63 25.43 0.00
DV03805 92.33 1086.56 44.71 0.00 DV03802 111.16 1086.67 44.61 0.00
C03908 30.21 911.03 81.03 0.00
NODE_010 0.00 919.33 81.78 0.00
C03802 54.16 927.35 22.71 0.00
DV03803 51.30 1086.77 47.10 0.00
DV03804 30.79 1086.78 46.92 0.00
EFID_046 0.00 930.99 36.00 0.00
EFID_047 0.00 930.95 36.53 0.00
C03911 0.00 910.16 81.61 0.00
C03910 23.65 910.20 81.72 0.00
C03912 23.93 910.16 82.00 0.00
C03800 0.00 931.01 36.43 0.00
C03801 51.30 928.60 22.71 0.00
EFID_048 0.00 928.95 22.86 0.00
EFID_049 0.00 929.99 27.50 0.00
C03903 13.39 919.29 85.29 0.00

Node Demand Head Pressure Quality
ID GPM ft psi --
EFID_050 0.00 777.04 36.73 0.00
C03710 11.40 931.17 40.83 0.00
C04007 235.99 774.60 32.87 0.00
C04008 14.24 774.60 32.61 0.00
C03520 65.54 843.04 74.90 0.00
DV03800 0.00 1091.32 25.51 0.00
EFID_051 0.00 1090.39 25.30 0.00
E03300 0.00 1063.01 54.51 0.00
EFID_052 0.00 1002.96 53.07 0.00
DV03106A_D 134.81 1000.71 55.11 0.00 E03200C 34.20 1063.04 54.41 0.00
E03318_2 22.80 824.20 54.85 0.00
NODE_050 0.00 1091.47 27.19 0.00
NODE_123 0.00 1087.07 46.18 0.00
NODE_013 0.00 779.01 40.01 0.00
DV03105 198.93 1000.35 50.19 0.00
C03905_2 13.69 914.68 85.98 0.00
E03200A 13.11 1063.58 54.42 0.00
C03911a 24.23 909.88 84.31 0.00
C03912a 4.57 910.13 85.92 0.00
DV04900 0.00 1252.10 78.60 0.00
DV03700 0.00 1092.71 10.00 0.00
DV03600 46.73 1252.13 78.44 0.00

C03709 184.11 932.25 57.40 0.00
DV03500 76.39 1252.59 80.38 0.00
DV03400 0.00 1252.62 80.42 0.00
E03200B 9.11 1063.49 54.37 0.00 C04001 16.25 778.87 34.53 0.00
DV03300 17.10 1253.02 80.45 0.00
DV04901 342.00 1091.05 12.51 0.00
DV03104 148.20 1017.54 51.03 0.00
C03708 59.86 931.51 96.08 0.00
C03707 163.59 933.34 81.85 0.00
NODE_008 0.00 933.26 79.44 0.00
E03100 6.83 1064.82 54.07 0.00
DV04909 106.59 1079.45 33.06 0.00
DV03200 66.98 1253.96 80.69 0.00
DV03102 28.50 1021.91 24.98 0.00
DV03103 99.19 1021.56 31.69 0.00
EFID_053 0.00 1021.18 37.67 0.00
E03000B 417.81 1065.20 54.65 0.00
C02218C 103.73 885.14 52.42 0.00
E03000A 5.70 1065.29 51.44 0.00
EFID_095 0.00 1064.81 54.32 0.00 NODE_117 0.00 1065.29 53.40 0.00
EFID_054 0.00 1067.91 55.58 0.00
E02900 124.27 1068.56 54.77 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
C03519 1.13 847.95 57.10 0.00
C03518 15.11 847.94 56.55 0.00
DV04910 2.86 1079.31 32.63 0.00
C03517 5.70 848.05 57.01 0.00
DV03000 11.40 1255.90 81.12 0.00
DV03100 0.00 1255.94 81.15 0.00
DV04911 0.57 1079.26 43.43 0.00 C03516 30.79 849.07 57.14 0.00
NODE_104 0.00 847.97 56.99 0.00
C02218B 17.10 889.41 40.00 0.00
E02800 91.20 1069.51 54.80 0.00
DV04912_DV04913 1.13 1079.18 52.39 0.00
C02214B 77.51 852.64 43.31 0.00
DV02900 85.50 1257.38 80.52 0.00
EFID_055 0.00 852.65 42.83 0.00
E02700 29.63 1069.87 54.90 0.00
DV02800 155.03 1257.74 79.42 0.00
DV04914 2.86 1079.10 40.68 0.00
DV02700 31.91 1257.85 80.15 0.00
C02214A 25.64 853.36 48.25 0.00
C03706_1 0.00 936.86 93.13 0.00
C03514 13.69 854.67 56.39 0.00
C03706_2 27.37 937.26 83.82 0.00
DV04915 2.86 1079.07 39.59 0.00 C03702 23.37 937.26 83.80 0.00
C03704_C03705 18.23 937.26 83.80 0.00
DV04916 74.10 1079.04 35.79 0.00
C02217 27.37 1069.19 79.56 0.00
C02218A 213.76 1067.34 90.04 0.00 DV02501_DV02502_DV02503 147.63 1090.25 91.68 0.00
C02214 42.19 853.58 40.00 0.00
C03515 14.24 853.49 56.50 0.00
E02600 1.71 855.91 40.00 0.00
NODE_024 0.00 1072.78 56.56 0.00
C03513 24.23 858.70 56.84 0.00
EFID_056 0.00 858.91 56.77 0.00
DV04917 2.86 1077.81 35.90 0.00
C03512 13.69 861.88 56.98 0.00
DV02600 3.41 1259.81 80.41 0.00
NODE_112 0.00 1079.03 35.70 0.00 C03511 11.40 864.11 58.14 0.00
C03510 18.23 869.25 58.17 0.00
C02216 94.61 1076.87 52.44 0.00
C03701B 254.21 1122.59 43.16 0.00

C03701A 245.10 1122.61 42.92 0.00
NODE_132 0.00 1122.60 43.16 0.00
EFID_057 0.00 1104.76 40.34 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi ---
EFID_058 0.00 1104.88 40.00 0.00
DV04918 11.40 1077.36 21.57 0.00
C02213 96.90 1080.34 75.66 0.00 C03509 2.29 871.40 56.67 0.00
C03700 0.00 1123.31 40.02 0.00
C03601B_2 271.89 1011.76 90.70 0.00
DV02500 0.00 1265.41 80.50 0.00
C02215 104.31 1088.28 45.79 0.00
E02500 126.53 1074.94 56.73 0.00
DV02400 118.57 1265.45 79.80 0.00
C03508 8.56 874.81 56.41 0.00
DV04919 74.38 1077.02 44.18 0.00
EFID_059 0.00 1082.56 61.20 0.00
C02212 79.80 1082.60 60.71 0.00
C03507 8.56 875.75 47.48 0.00
EFID_060 0.00 875.82 46.81 0.00
E02400 15.97 1075.63 56.94 0.00
NODE_204 0.00 1017.36 25.01 0.00
E02300 43.89 1075.94 57.09 0.00
C03506 136.23 877.61 36.84 0.00 EFID_061 0.00 878.42 36.37 0.00
C03505 66.11 891.40 35.00 0.00
EFID_062 0.00 879.43 36.32 0.00
DV02300 139.09 1270.06 83.67 0.00
C03601A 96.33 1227.02 73.29 0.00
EFID_064 0.00 1094.20 25.04 0.00
C03504 55.87 1039.27 86.82 0.00
C02211AB 380.77 1199.69 67.95 0.00
E02200 62.70 1079.81 57.74 0.00
C03503 108.87 1041.26 65.76 0.00
EFID_065 0.00 1042.01 63.34 0.00
DV02200 5.70 1271.87 84.13 0.00
DV02100 14.81 1272.10 82.94 0.00
DV02000 19.39 1272.65 83.75 0.00
E02000 13.11 1080.44 56.82 0.00
EFID_066 0.00 1046.21 40.03 0.00
C03501_1 0.00 1046.16 40.18 0.00 E02100 68.40 1081.04 58.04 0.00
C03502 137.93 1045.59 39.82 0.00
DV01900 79.23 1274.61 84.32 0.00
C03600_1 0.00 1373.85 81.25 0.00
C03302A 262.20 1373.82 80.66 0.00
C03302B 300.39 1373.82 80.66 0.00
C03600_2 0.00 1244.09 25.03 0.00
EFID_067 0.00 1373.88 79.26 0.00
EFID_068 0.00 1373.89 78.97 0.00
C02207A_F 889.77 1218.46 17.86 0.00

Node Results: (continued) ---
Node Demand Head Pressure Quality
ID GPM ft psi ---
NODE_129 0.00 1219.96 23.21 0.00
C02208 42.19 1212.61 41.87 0.00
C02210A_B 461.13 1206.02 58.40 0.00
C02209 224.01 1212.35 41.54 0.00
C02206 1.71 1220.04 25.31 0.00
E01900 2.86 1082.48 56.34 0.00
C03400D 219.46 1349.06 28.50 0.00
E01209 142.50 1081.00 55.64 0.00

E01208 3.41 1081.13 55.67 0.00
EFID_094 0.00 1082.58 56.05 0.00
DV01800A_D 70.11 1278.47 83.06 0.00
DV01700 74.67 1278.70 83.07 0.00
C02205 251.37 1221.01 42.57 0.00
C03501_2 171.00 1376.41 69.96 0.00
C03500 0.00 1376.43 69.53 0.00
E01207 14.81 1083.38 56.83 0.00
EFID_069 0.00 1083.42 56.86 0.00 E01205 1.13 1088.44 57.37 0.00
E01206 1.13 1088.29 58.76 0.00
C02204 193.80 1221.45 45.58 0.00
E01204 17.67 1088.88 57.70 0.00
E01203 34.20 1089.42 58.78 0.00
E01202 3.14 1090.69 74.42 0.00
C03400B 105.44 1350.73 31.36 0.00
C02203 69.83 1222.18 46.11 0.00
C03400C 228.00 1351.85 32.82 0.00
E01201 2.56 1091.37 82.95 0.00
DV01600 153.33 1280.75 85.65 0.00
EFID_070 0.00 1378.67 69.85 0.00
C03301 101.47 1378.67 69.85 0.00
DV01500 83.21 1281.73 85.05 0.00
DV01400 155.03 1281.92 85.37 0.00
C02202 102.60 1225.97 44.89 0.00
C03400A 108.30 1357.33 51.85 0.00 C04901DD 51.30 1447.04 62.18 0.00
C04901DB 193.80 1447.79 64.09 0.00
EFID_071 0.00 1379.97 47.35 0.00
C02201 134.51 1210.41 54.90 0.00
DV01300 114.00 1285.76 85.17 0.00
C04901DC 50.73 1447.03 62.42 0.00
NODE_007 0.00 1227.62 40.00 0.00
DV01200 63.83 1286.03 85.78 0.00
C04901DA 79.80 1453.54 69.34 0.00
EFID_400 0.00 1105.68 10.06 0.00
E01200 0.00 1105.59 9.87 0.00
C01205C 107.17 1086.89 40.00 0.00
NODE_023 0.00 1100.64 88.84 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality ID GPM ft psi --

C05400 97.47 1252.17 87.00 0.00
C01403C 7.99 1267.81 80.61 0.00
EFID_073 0.00 1288.47 87.28 0.00
C04901Ba 129.39 1459.22 57.41 0.00
C04901Bb_C04901C 450.30 1459.15 57.79 0.00
DV01104 222.87 1285.49 92.38 0.00
C03400 0.00 1382.88 26.60 0.00
E01000C 15.39 1100.47 62.30 0.00
C04901D 0.00 1461.26 40.01 0.00
C01205B 5.70 1275.26 89.30 0.00
C04901A 45.60 1461.25 40.10 0.00
C01205A 281.59 1277.29 79.65 0.00
C01205 0.00 1277.35 79.37 0.00
EFID_074 0.00 1267.85 40.00 0.00 EFID_075 0.00 1568.41 127.95 0.00
C01703A 124.27 1486.35 88.15 0.00
C01703B 139.09 1486.24 88.71 0.00
C01204 47.89 1281.49 60.89 0.00
E01000D 0.57 1100.47 61.95 0.00
C01702 8.56 1488.81 61.52 0.00
EFID_076 0.00 1489.12 58.05 0.00
C01203 30.79 1288.25 35.69 0.00
C05300 503.89 1338.18 40.00 0.00
EFID_077 0.00 1269.28 10.04 0.00
NODE_110 0.00 1291.99 23.39 0.00
C02600 96.05 1569.33 2.76 0.00

C01202 5.70 1290.59 24.98 0.00
C02100 750.98 1570.75 2.87 0.00
C02700 205.20 1569.06 2.14 0.00
C02200 0.00 1570.74 2.39 0.00
C02000 13.11 1570.83 1.54 0.00 C02300 103.45 1570.57 2.64 0.00
C02800 99.19 1568.89 3.02 0.00
C01403A 202.91 1465.95 40.09 0.00
C01403B 149.33 1466.01 40.01 0.00
C01900 5.70 1571.13 2.48 0.00
C03000 200.07 1568.67 3.67 0.00
C02900 80.93 1568.67 3.63 0.00
C03100 216.03 1568.66 3.71 0.00
EFID_078 0.00 1387.40 0.05 0.00
C02500 25.64 1569.69 2.44 0.00
C03200 0.00 1568.49 4.32 0.00
C01701 53.01 1495.31 30.00 0.00
C01800 2.86 1571.24 1.80 0.00
DV01103 165.87 1295.00 20.00 0.00
C03300 0.00 1568.31 4.41 0.00
C02400 10.83 1570.08 2.19 0.00

Node Demand Head Pressure Quality
ID GPM ft psi ---
C05100 203.49 1564.53 8.60 0.00
EFID_079 0.00 1562.23 10.15 0.00
EFID_080 0.00 1562.19 10.64 0.00
C01700 0.00 1571.41 2.00 0.00
C01600 11.40 1571.42 2.03 0.00
EFID_081 0.00 1571.36 1.96 0.00
EFID_082 0.00 1295.86 86.24 0.00
EFID_083 0.00 1562.21 7.90 0.00
C05000 54.71 1564.77 11.17 0.00
EFID_084 0.00 1562.28 9.05 0.00 EFID_085 0.00 1562.29 9.05 0.00
C04800 28.50 1563.04 30.61 0.00
NODE_109 0.00 1476.15 104.20 0.00
C05200 85.50 1562.39 7.83 0.00
C01500 15.97 1571.47 1.82 0.00
C01201 49.01 1494.16 40.00 0.00
C04900 0.00 1565.73 7.24 0.00
C01400 0.00 1571.50 1.96 0.00
C04700 355.39 1565.93 6.61 0.00
C01401A 13.11 1571.45 1.94 0.00
EFID_086 0.00 1486.23 78.64 0.00
DV01102 68.40 1297.60 0.03 0.00
C04200 159.60 1567.68 5.25 0.00
C01401B 28.50 1571.45 1.95 0.00
EFID_099 0.00 1567.72 4.67 0.00
C04600 221.73 1566.16 6.03 0.00
EFID_087 0.00 1489.15 70.04 0.00 C04300 88.34 1567.43 5.59 0.00
C01300 45.60 1571.75 0.54 0.00
C04400 97.47 1567.20 5.40 0.00
C04500 47.31 1566.72 6.50 0.00
C01200 0.00 1572.20 0.91 0.00
DV01101 117.41 1503.91 40.00 0.00
DV01100_DV01000 0.00 1570.40 0.11 0.00
NODE_203 0.00 1573.33 -1.98 0.00
M05900B 237.69 1626.97 11.23 0.00
C01100_1 0.00 1573.79 -0.08 0.00
EFID_088 0.00 1573.80 0.03 0.00
C01000 34.77 1573.80 0.03 0.00
NODE_135 0.00 1572.35 0.54 0.00
M06200 0.00 1631.49 27.44 0.00
M06100 3.99 1631.92 25.64 0.00
M06000 1.13 1632.06 25.66 0.00
C01100_2 11.40 1631.50 26.33 0.00 NODE_005 0.00 1627.63 24.78 0.00
M05900A 6.27 1632.51 3.97 0.00

M05900 8.56 1632.51 3.97 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
M05800 2.29 1632.50 4.56 0.00
M04419 45.60 1629.47 45.11 0.00
M04418 7.41 1629.86 38.84 0.00
M04417 5.70 1630.01 36.94 0.00
NODE_004 0.00 1630.49 37.13 0.00
NODE_125 0.00 1632.44 9.50 0.00
M06200b 157.89 1610.82 25.49 0.00 M05700 5.13 1632.95 4.53 0.00
M04420 11.40 1630.45 38.06 0.00
M04421 8.56 1630.41 40.13 0.00
M04422 5.98 1630.40 39.25 0.00
M04415 11.97 1630.81 46.53 0.00
M04416 14.24 1630.80 46.47 0.00
M04423 1.99 1630.40 39.33 0.00
M05600 43.43 1633.65 5.03 0.00
M04414 10.27 1631.53 44.89 0.00
NODE_202 0.00 1631.83 44.85 0.00
M05500 5.70 1634.14 4.65 0.00
M05400 3.41 1634.15 4.73 0.00
M05300 3.41 1634.40 4.72 0.00
M04413 45.60 1632.07 40.56 0.00
M04412 5.70 1632.26 37.92 0.00
M04411 8.56 1632.26 37.69 0.00
M04410 62.70 1632.29 37.46 0.00 M04401 2.86 1635.48 15.83 0.00
M05200 17.10 1634.91 4.97 0.00
M04800 4.57 1635.24 4.23 0.00
M04408 75.23 1630.30 7.68 0.00
M04409 402.99 1630.29 7.51 0.00
M04406 1.71 1631.13 22.82 0.00
M04407 5.70 1630.70 15.15 0.00
M04900 49.01 1635.15 4.99 0.00
M05000 1.71 1635.14 5.04 0.00
M05100 2.86 1635.14 5.04 0.00
CP_WB_DS_2 0.00 1635.77 2.48 0.00
M04405 11.40 1631.84 30.88 0.00
M04700 5.70 1635.36 4.27 0.00
M04404 5.70 1632.59 29.82 0.00
NODE_002 0.00 1633.09 32.35 0.00
NODE_200 0.00 1635.97 -0.68 0.00
M04600 10.83 1636.02 3.94 0.00 M04400 0.00 1638.97 5.27 0.00
M04500 2.86 1636.02 3.97 0.00
M04300 0.00 1636.02 3.99 0.00
M04200_1 0.00 1632.97 1.45 0.00
M04202 2.86 1632.97 1.45 0.00
M04201 11.40 1632.98 1.45 0.00

Node Results: (continued) --

Node Demand Head Pressure Quality
ID GPM ft psi --
M04403 84.93 1633.78 7.26 0.00
M04200_2 0.00 1636.17 4.15 0.00
M04203 3.41 1628.40 0.04 0.00
M04100 21.09 1636.73 4.15 0.00 EFID_093 0.00 1636.33 4.25 0.00
M03900 53.01 1637.99 4.61 0.00
M03800 74.10 1638.15 4.73 0.00
M04000 3.41 1637.94 4.76 0.00
M04204 5.70 1627.00 0.34 0.00
M04205 5.70 1626.86 0.14 0.00
M04206 17.10 1626.63 0.11 0.00

M03700 39.90 1638.68 3.61 0.00
M04207 5.70 1622.91 0.65 0.00
M04209 45.03 1619.10 0.63 0.00
M04208 9.11 1619.73 0.83 0.00
M03600 86.63 1640.39 5.06 0.00
M04210 11.40 1617.89 7.51 0.00
M03500 55.87 1640.90 5.03 0.00
M04211 8.56 1614.54 16.30 0.00
M04212 2.86 1614.54 16.37 0.00
M03400 27.93 1641.44 4.94 0.00 M03300 18.81 1641.52 4.89 0.00
NODE_113 0.00 1614.54 16.02 0.00
M03200 20.51 1641.99 5.19 0.00
M03100 11.40 1642.16 5.16 0.00
M03000 26.21 1642.27 4.76 0.00
M04213 5.70 1610.39 3.95 0.00
NODE_114 0.00 1642.27 5.25 0.00
NODE_115 0.00 1610.39 9.21 0.00
M02900 41.61 1643.30 5.38 0.00
M02800 22.80 1643.67 5.57 0.00
M02700 49.01 1644.13 5.59 0.00
M04214 139.64 1601.30 17.52 0.00
M04216 12.53 1601.29 17.51 0.00
M04215 120.83 1599.51 1.48 0.00
M02600 14.81 1644.43 5.47 0.00
EFID_089 0.00 1576.89 40.00 0.00
NODE_022 0.00 1646.00 5.64 0.00 EFID_090 0.00 1562.04 37.22 0.00
M02300A_C 58.71 1647.05 5.48 0.00
M02400_M02500 156.19 1553.67 40.60 0.00
M02200 22.80 1647.51 5.40 0.00
M02100 49.31 1647.83 5.38 0.00
M02000A 64.19 1648.78 5.21 0.00
M02000B 209.77 1648.84 5.46 0.00
M01900 0.00 1649.69 5.91 0.00
M01800 30.21 1650.09 4.83 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality
ID GPM ft psi --
M01700A 1.71 1650.93 5.72 0.00 M01700B 1.71 1650.93 5.72 0.00
M01600 119.70 1652.49 6.37 0.00
M01500 82.09 1653.96 6.44 0.00
M01400 25.09 1654.71 6.69 0.00
M01300 3.41 1655.22 6.59 0.00
M01200 91.20 1656.47 6.79 0.00
MHID_POD_East 2901.02 1661.47 5.13 0.00
M01100_1 2.86 1665.30 7.04 0.00
MHID_POD 2901.02 1665.49 7.02 0.00
M01100_2 17.10 1667.06 2.62 0.00
LHP_DS_2 0.00 560.02 15.00 0.00
LHP_US_2 0.00 822.52 128.74 0.00
LL_US_1 0.00 1039.51 131.94 0.00
LL_DS_1 0.00 792.70 25.00 0.00
CR_DS_1 0.00 1036.23 50.79 0.00
CR_US_1 0.00 1036.24 50.80 0.00
MC_WB_US 0.00 1631.46 24.98 0.00 MC_WB_DS 0.00 1573.80 0.00 0.00
CP_WB_US_2 0.00 1635.77 2.46 0.00
SR_WB_DS 0.00 1269.28 10.00 0.00
SR_WB_US 0.00 1553.72 133.25 0.00
EA_WB_US 0.00 1250.73 72.85 0.00
EA_WB_DS 0.00 1105.68 10.00 0.00
O_DS_2 0.00 1387.40 0.00 0.00
O_US_2 0.00 1566.48 77.60 0.00
CHL_DS_1 0.00 1094.20 25.00 0.00
CHL_US_1 0.00 1197.86 69.92 0.00
CHL_US_2 0.00 1562.40 185.02 0.00
GL_US_1 0.00 1545.72 74.54 0.00

GL_DS_1 0.00 1466.01 40.00 0.00
MCL_US_1 0.00 1070.27 74.73 0.00
DVP_US_1 0.00 1564.68 115.72 0.00
DVP_DS_1 0.00 1297.60 0.00 0.00
TL_DS 0.00 748.49 40.42 0.00 TL_US 0.00 748.50 40.43 0.00
KL_DS 0.00 766.31 40.00 0.00
KL_US 0.00 1016.29 148.31 0.00
PL_DS 0.00 830.06 47.00 0.00
PL_US 0.00 830.06 47.00 0.00
DSL_DS 0.00 759.91 40.00 0.00
DSL_US 0.00 1014.37 150.26 0.00
RRL_US 0.00 1048.95 132.39 0.00
RRL_DS 0.00 835.71 40.00 0.00
AL_US 0.00 1544.01 75.83 0.00
AL_DS 0.00 1461.31 40.00 0.00
NML_US 0.00 1367.38 179.16 0.00

Node Results: (continued) --
Node Demand Head Pressure Quality
ID GPM ft psi --
NML_DS 0.00 1046.21 40.00 0.00
NFL_US 0.00 1214.45 110.38 0.00
NFL_DS 0.00 1017.40 25.00 0.00
O_US_3 0.00 1367.03 145.60 0.00
O_DS_3 0.00 1123.31 40.00 0.00
BL_US 0.00 1489.17 58.05 0.00
BL_DS 0.00 1489.17 58.05 0.00
WL_DS 0.00 1290.70 25.00 0.00
WL_US 0.00 1486.20 109.71 0.00
CHH_US 0.00 1090.58 91.81 0.00
CHH_DS 0.00 1090.57 91.80 0.00
SHH_US 0.00 1247.05 122.52 0.00
SHH_DS 0.00 1022.00 25.00 0.00
US_LRL 0.00 981.66 138.34 0.00
DS_LRL 0.00 754.71 40.00 0.00 US_SHP 0.00 827.80 135.41 0.00
DS_SHP 0.00 607.61 40.00 0.00
TFL_DS 0.00 657.51 40.00 0.00
TFL_US 0.00 832.98 116.03 0.00
TLL_US 0.00 1072.78 133.97 0.00
TLL_DS 0.00 855.91 40.00 0.00
DRL_DS 0.00 940.07 85.00 0.00
DRL_US 0.00 1122.59 164.09 0.00
O_DS_1 0.00 1244.10 25.00 0.00
O_US_1 0.00 1373.85 81.22 0.00
US_WCP 0.00 1021.08 116.33 0.00
US_TL2 0.00 1017.04 135.08 0.00
PL2_US 0.00 1023.59 102.86 0.00
US_CR2 0.00 1010.02 150.02 0.00
US_ML 0.00 1052.14 95.34 0.00
US_NML2 0.00 1035.98 97.61 0.00
US_NEML 0.00 901.60 93.12 0.00 DS_NEML 0.00 779.01 40.00 0.00
US_DRL2 0.00 911.59 92.29 0.00
DS_DRL3 0.00 868.91 40.00 0.00
US_DRL3 0.00 915.54 60.20 0.00
US_BL2 0.00 1566.32 60.76 0.00
US_GL3 0.00 1465.85 125.77 0.00
US_WLB3 0.00 1566.07 71.13 0.00
US_WBL4 0.00 1266.54 117.83 0.00
US_CH3 0.00 1562.74 65.45 0.00
US_BL3 0.00 1060.35 114.02 0.00
US_MBH1 0.00 1071.85 134.56 0.00
US_DV3 0.00 1252.00 78.99 0.00
US_CRLO 0.00 1047.79 73.87 0.00
US_POL 0.00 1068.43 108.34 0.00
US_RA 0.00 1079.50 88.74 0.00

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Node Results: (continued) ---

Node Demand Head Pressure Quality
ID GPM ft psi --
US_ACH 0.00 1077.68 92.94 0.00
US_FS 0.00 1618.94 58.21 0.00
US_CHL3 0.00 1258.43 106.52 0.00
US_SHP2 0.00 1470.37 95.96 0.00
US_CLP 0.00 1562.29 9.05 0.00
US_CLP2 0.00 1549.27 131.45 0.00
NODE_300 0.00 1025.30 110.01 0.00
E06614 51.30 814.73 35.00 0.00
US_LHP2 0.00 946.38 78.85 0.00
US_WCP4 0.00 980.33 50.06 0.00
NODE_330 0.00 1005.28 92.91 0.00
US_MC 0.00 1634.77 28.86 0.00 Reservoir_1 -29000.00 1669.00 0.00 0.00 Reservoir Reservoir_2 -30843.67 1669.00 0.00 0.00 Reservoir

Link Results: --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Central_Lateral_Pipeline_000 39874.56 3.14 0.36 Open Central_Lateral_Pipeline_001a 39874.56 3.14 0.35 Open Central_Lateral_Pipeline_002 39301.12 3.10 0.34 Open Central_Lateral_Pipeline_003 38899.28 3.07 0.34 Open Central_Lateral_Pipeline_004 38883.31 3.06 0.34 Open Central_Lateral_Pipeline_005 38871.91 3.06 0.34 Open Central_Lateral_Pipeline_006 38546.98 3.04 0.33 Open Central_Lateral_Pipeline_007 38544.13 3.04 0.33 Open Central_Lateral_Pipeline_008 38538.43 3.04 0.33 Open Central_Lateral_Pipeline_009 38525.31 3.04 0.33 Open Central_Lateral_Pipeline_010 19699.30 3.49 0.69 Open Central_Lateral_Pipeline_011 19644.59 3.48 0.69 Open Central_Lateral_Pipeline_012 19441.10 8.82 6.64 Open Central_Lateral_Pipeline_015 34139.70 3.87 0.64 Open Central_Lateral_Pipeline_016 34025.42 3.86 0.64 Open Central_Lateral_Pipeline_017 33999.78 3.86 0.64 Open Central_Lateral_Pipeline_018 34036.25 3.86 0.64 Open Central_Lateral_Pipeline_019 33698.53 3.82 0.63 Open Central_Lateral_Pipeline_020 33903.73 3.85 0.64 Open Central_Lateral_Pipeline_021 33102.31 3.76 0.61 Open Central_Lateral_Pipeline_022 33102.31 3.76 0.61 Open Central_Lateral_Pipeline_023 33518.41 3.80 0.62 Open Central_Lateral_Pipeline_024 33318.34 3.78 0.60 Open Central_Lateral_Pipeline_025 33599.34 3.81 0.62 Open Central_Lateral_Pipeline_026 18517.73 8.40 6.06 Open Central_Lateral_Pipeline_027 18851.72 8.56 6.32 Open Central_Lateral_Pipeline_028 18851.72 8.56 6.26 Open

Link Results: (continued) ---

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Central_Lateral_Pipeline_029a 18851.72 8.56 6.27 Open Central_Lateral_Pipeline_029b 18851.72 8.56 6.29 Open Central_Lateral_Pipeline_030 18851.72 8.56 6.26 Open Central_Lateral_Pipeline_031a 18754.25 8.51 6.21 Open Central_Lateral_Pipeline_031b 18754.25 8.51 6.10 Open Christopher_Pipeline_000b 849.88 0.60 0.08 Open Christopher_Pipeline_001 847.03 0.60 0.06 Open Christopher_Pipeline_002A 836.20 0.59 0.06 Open Christopher_Pipeline_002B 836.20 1.67 0.72 Open Christopher_Pipeline_002C 836.20 1.67 0.72 Open Christopher_Pipeline_003 833.34 1.66 0.72 Open Christopher_Pipeline_004 748.41 1.50 0.59 Open Christopher_Pipeline_005 502.73 2.26 2.03 Open Christopher_Pipeline_006 497.03 2.24 1.99 Open Christopher_Pipeline_007 485.63 2.18 1.91 Open Christopher_Pipeline_008 478.22 2.15 1.85 Open Christopher_Pipeline_009 483.92 2.18 1.89 Open Christopher_Pipeline_010 402.99 1.81 1.35 Open Christopher_Pipeline_011 245.68 1.72 1.59 Open Christopher_Pipeline_012 182.98 1.28 0.92 Open Christopher_Pipeline_013 174.43 0.78 0.29 Open Christopher_Pipeline_014 168.73 1.18 0.79 Open Christopher_Pipeline_015a 123.13 0.86 0.44 Open Christopher_Pipeline_015b 123.13 1.53 1.77 Open Christopher_Pipeline_016 112.86 1.40 1.51 Open Christopher_Pipeline_017 86.64 1.07 0.93 Open Christopher_Pipeline_018 100.89 1.25 1.24 Open Christopher_Pipeline_019 58.71 1.41 2.24 Open Christopher_Pipeline_020 53.01 1.27 1.85 Open Christopher_Pipeline_021 45.60 1.14 1.54 Open Christopher_Pipeline_022 27.93 0.67 0.56 Open Christopher_Pipeline_024 1.99 0.05 0.00 Open Christopher_Pipeline_025 7.97 0.19 0.05 Open Christopher_Pipeline_026 16.53 0.41 0.24 Open Highline_Canal_001 74.38 0.79 0.48 Open

Highline_Canal_002 85.78 0.91 0.63 Open
Highline_Canal_003 7883.23 6.03 4.45 Open
Highline_Canal_004 88.64 0.36 0.06 Open
Highline_Canal_005 162.74 0.66 0.19 Open
Highline_Canal_006 165.59 0.67 0.20 Open
Highline_Canal_007 168.45 0.68 0.21 Open
Highline_Canal_008 169.58 0.69 0.21 Open
Highline_Canal_009 170.15 0.69 0.21 Open
Highline_Canal_010 173.01 0.70 0.22 Open
Highline_Canal_011 279.59 1.13 0.53 Open
Highline_Canal_012 280.16 1.13 0.53 Open Highline_Canal_013 1487.95 2.77 1.78 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Highline_Canal_014 1829.95 3.41 2.61 Open
Highline_Canal_015 1486.82 2.77 1.77 Open
Highline_Canal_016 728.75 2.10 1.36 Open
Highline_Canal_017 731.61 2.10 1.37 Open
Highline_Canal_018 1331.79 2.48 1.45 Open Highline_Canal_019a 1174.48 2.19 1.15 Open
Highline_Canal_020 782.91 2.25 1.55 Open
Ackerman_Hill_000 634.13 3.99 7.07 Open
Ackerman_Hill_001 638.41 4.01 7.15 Open Ackerman_Hill_002 649.24 4.08 7.38 Open
Ackerman_Hill_003 640.13 4.03 7.19 Open
Ackerman_Hill_004 651.53 4.10 7.43 Open
Ackerman_Hill_005 838.52 3.39 4.05 Open
Ackerman_Hill_006 1435.05 4.13 4.77 Open
Ackerman_Hill_007 971.06 3.93 5.31 Open
Ackerman_Hill_008 1029.49 4.16 5.92 Open
Ackerman_Hill_009 1248.38 3.59 3.68 Open
Ackerman_Hill_010 971.06 3.93 5.31 Open
Ackerman_Hill_011 855.62 3.59 4.59 Open
Ackerman_Hill_013 862.76 3.62 4.66 Open
Ackerman_Hill_014 2098.82 4.15 3.86 Open
Ackerman_Hill_016 58.73 1.41 2.24 Open
Ackerman_Hill_017 101.47 2.43 6.16 Open
Ackerman_Hill_018 151.92 3.50 11.85 Open
Ackerman_Hill_019 146.22 3.37 11.04 Open Ackerman_Hill_020 143.08 3.43 11.64 Open
Ackerman_Hill_021 634.13 3.99 7.07 Open
Ackerman_Hill_022 9.11 0.23 0.08 Open
Ackerman_Hill_023 41.63 1.04 1.30 Open
Ackerman_Hill_024 4.57 0.11 0.02 Open
Ackerman_Hill_025 148.81 3.56 12.52 Open
Ackerman_Hill_026 141.67 3.39 11.43 Open
Ackerman_Hill_027 5.70 0.14 0.02 Open
Ackerman_Hill_028 31.91 0.76 0.72 Open
Ackerman_Hill_029 35.90 0.86 0.90 Open
Ackerman_Hill_030 37.89 0.91 1.00 Open
Ackerman_Hill_031 42.46 1.02 1.23 Open
Ackerman_Hill_032 46.74 1.12 1.47 Open
Ackerman_Hill_033 50.73 1.21 1.71 Open
Ackerman_Hill_034 78.66 1.88 3.84 Open
Ackerman_Hill_035 78.66 1.88 3.84 Open Ackerman_Hill_036 63.02 1.51 2.55 Open
Ackerman_Hill_037 21.67 0.52 0.35 Open
Ackerman_Hill_038 21.67 0.52 0.35 Open
Ackerman_Hill_039 22.52 0.54 0.38 Open
Ackerman_Hill_040 3.71 0.09 0.01 Open
Ackerman_Hill_041 7.12 0.17 0.04 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Ackerman_Hill_042 8.56 0.20 0.06 Open

Ackerman_Hill_043 4.58 0.11 0.02 Open
Ackerman_Hill_044 3.15 0.08 0.01 Open
Ackerman_Hill_045 1.71 0.04 0.00 Open Ackerman_Hill_046 4.57 0.11 0.02 Open
Ackerman_Hill_047 479.36 3.01 4.21 Open
Ackerman_Hill_048 173.84 4.01 15.21 Open
Ackerman_Hill_049 1438.19 4.13 4.79 Open
Ackerman_Hill_050 41.35 0.99 1.17 Open
Ackerman_Hill_051 27.10 0.65 0.53 Open
Ackerman_Hill_052 17.10 0.43 0.25 Open
Ackerman_Hill_053 7.99 0.20 0.06 Open
Ackerman_Hill_054 10.27 0.26 0.10 Open
Ackerman_Hill_055 1.42 0.04 0.00 Open
Allison_Line_000 1029.41 4.16 5.92 Open
Allison_Line_001a 1000.91 4.62 7.74 Open
Allison_Line_002 579.69 3.65 5.98 Open
Allison_Line_003 450.30 4.80 13.56 Open Arens_Lateral_Line_000 6.27 0.14 0.00 Open
Arens_Lateral_Line_001 237.69 2.53 4.15 Open Bailey/Luse/Schultz_000 26.21 0.01 0.00 Open
Bailey_Line_000 59.86 1.49 2.55 Open
Bartlett_Loop_000 18.23 0.44 0.26 Open
Bartlett_Loop_007 80.36 1.85 3.64 Open
Bartlett_Loop_008 22.23 0.51 0.34 Open
Bartlett_Loop_009 58.13 1.34 2.00 Open
Bartlett_Loop_010 39.90 0.92 1.00 Open
Bartlett_Loop_011 39.90 0.92 1.00 Open
Bietler_Line_000 324.93 3.46 7.40 Open
Bietler_Line_001 324.93 3.74 8.91 Open
Bietler_Line_002a 271.91 2.90 5.33 Open
Bietler_Line_003 271.91 3.00 5.81 Open
Bietler_Line_004 263.36 3.03 6.04 Open
Bietler_Line_005 139.09 3.46 12.15 Open
Bowcut_Pipeline_000 290.12 3.09 6.01 Open Bowcut_Pipeline_001 301.52 3.21 6.45 Open
Bowcut_Pipeline_002 355.66 3.79 8.76 Open Bowcut_Pipeline_003 346.54 3.69 8.35 Open
Bowcut_Pipeline_004 361.36 3.85 9.02 Open Bowcut_Pipeline_005 378.46 4.03 9.83 Open
Bowcut_Pipeline_006 384.16 4.10 10.10 Open Bowcut_Pipeline_007 389.86 1.58 0.98 Open
Bowcut_Pipeline_008 393.27 4.19 10.55 Open Bowcut_Pipeline_009 407.53 4.34 11.27 Open
Bowcut_Pipeline_010 396.13 4.22 10.99 Open Bowcut_Pipeline_011 0.00 0.00 0.00 Open
Bowcut_Pipeline_012 11.41 0.26 0.10 Open

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Bowcut_Pipeline_013 8.56 0.20 0.07 Open Bowcut_Pipeline_014 120.83 2.78 7.75 Open
Bowcut_Pipeline_015 133.36 3.19 10.24 Open Bowcut_Pipeline_016 273.00 3.02 5.86 Open
Bowcut_Pipeline_017 5.70 0.13 0.03 Open Bowcut_Pipeline_018 278.70 2.97 5.58 Open
Buckley_Line_000 120.83 3.18 10.71 Open
Buckley_Line_001 103.73 2.39 5.85 Open
Cameron_Hill_000 388.74 4.47 12.42 Open
Cameron_Hill_001a 388.74 4.30 11.27 Open
Cameron_Hill_003 506.16 3.44 5.63 Open Central_Lateral_Pipeline_013 503.89 3.17 4.62 Open
Central_Lateral_Pipeline_014 503.89 4.25 9.43 Open Central_Lateral_Pipeline_032 0.57 0.01 0.00 Open Central_Lateral_Pipeline_033 15.96 0.38 0.20 Open Central_Lateral_Pipeline_044 37774.34 2.98 0.32 Open Central_Lateral_Pipeline_045 21698.57 3.85 0.82 Open
Central_Lateral_Pipeline_046 21305.84 3.78 0.80 Open Central_Lateral_Pipeline_047 21698.57 3.85 0.82 Open Central_Lateral_Pipeline_048 21353.15 3.79 0.80 Open
Central_Lateral_Pipeline_049 21450.63 3.80 0.81 Open Central_Lateral_Pipeline_050 21538.97 3.82 0.81 Open Central_Lateral_Pipeline_051 21084.11 3.74 0.78 Open
Central_Lateral_Pipeline_052 20728.72 3.68 0.76 Open Central_Lateral_Pipeline_053 19355.60 8.79 6.58 Open Central_Lateral_Pipeline_054 18533.68 8.41 6.07 Open
Chamberlin_Pressure_Line_000 955.31 4.01 5.63 Open Chamberlin_Pressure_Line_001 1126.62 4.56 6.99 Open Chamberlin_Pressure_Line_002 982.69 3.97 5.43 Open
Chamberlin_Pressure_Line_003 1011.19 4.09 5.72 Open Chamberlin_Pressure_Line_004 507.30 3.45 5.66 Open Chamberlin_Pressure_Line_005 421.23 4.84 14.41 Open
Chamberlin_Pressure_Line_006 289.56 3.33 7.20 Open Chamberlin_Pressure_Line_007 289.56 3.33 7.20 Open Chamberlin_Pressure_Line_008 83.23 2.07 4.70 Open
Chamberlin_Pressure_Line_009 83.23 2.07 4.69 Open Chamberlin_Pressure_Line_010 67.83 1.56 2.66 Open Chamberlin_Pressure_Line_011 67.83 1.56 2.66 Open Chamberlin_Pressure_Line_012

105.74 2.44 6.06 Open Chamberlin_Pressure_Line_013 711.93 4.64 9.53 Open
Chamberlin_Pressure_Line_014 683.43 4.45 8.84 Open Chamberlin_Pressure_Line_015 657.21
4.28 8.22 Open Chamberlin_Pressure_Line_016 515.29 3.50 5.82 Open
Chamberlin_Pressure_Line_017 515.29 3.36 5.24 Open Chamberlin_Pressure_Line_018 80.37
2.00 4.40 Open Chamberlin_Pressure_Line_019 7.99 0.20 0.06 Open
Chamberlin_Pressure_Line_020 360.80 3.85 8.99 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Chamberlin_Pressure_Line_021 2171.45 3.96 3.39 Open Chamberlin_Pressure_Line_023 1691.49
4.86 6.46 Open Chamberlin_Pressure_Line_024 1955.98 4.66 5.36 Open
Chamberlin_Pressure_Line_025 2893.37 4.51 3.94 Open Chamberlin_Pressure_Line_026 2590.97
4.04 3.21 Open Chamberlin_Pressure_Line_027 2239.27 4.42 4.36 Open
Chamberlin_Pressure_Line_028 2452.46 4.84 5.16 Open Chamberlin_Pressure_Line_029 160.17
3.69 13.07 Open Chamberlin_Pressure_Line_030 200.63 4.62 19.84 Open
Chamberlin_Pressure_Line_031 1585.76 4.56 5.74 Open Chamberlin_Pressure_Line_032 1487.42
4.28 5.09 Open Chamberlin_Pressure_Line_033 210.32 3.52 9.93 Open
Chamberlin_Pressure_Line_034 243.39 2.69 4.74 Open Chamberlin_Pressure_Line_035 2.86 0.07
0.01 Open Chamberlin_Pressure_Line_036 5737.77 4.83 3.11 Open
Chamberlin_Pressure_Line_037 5737.77 4.29 2.33 Open Chamberlin_Road_Line_Overflow_000
278.72 3.21 6.71 Open Chamberlin_Road_Line_Overflow_001 165.30 3.96 15.21 Open
Chamberlin_Road_Line_Overflow_001b 53.01 1.27 1.85 Open Chamberlin_Road_Line_Overflow_002
277.59 3.19 6.66 Open Cherry_Hill_Line_000 147.63 3.88 15.52 Open Cherry_Hill_Line_001
147.63 3.40 11.24 Open Cherry_Hill_Line_002a 147.63 3.68 13.57 Open Chipping_Line_000
134.51 3.10 9.46 Open
Chipping_Line_002a 3634.63 3.63 2.03 Open
Chipping_Line_003 3634.63 4.32 3.11 Open
Chipping_Line_004 3500.12 4.09 2.77 Open
Chipping_Line_005 3397.52 4.90 4.38 Open
Chipping_Line_009 1263.70 3.76 4.11 Open
Chipping_Line_010a 882.93 3.87 5.40 Open
Chipping_Line_010b 882.93 3.57 12.21 Open Chipping_Line_011 1724.83 4.26 4.63 Open
Chipping_Line_012 1948.84 4.65 5.33 Open
Chipping_Line_014 1991.03 4.75 5.54 Open
Chipping_Line_015 560.89 3.53 5.63 Open
Chipping_Line_016 456.57 4.87 13.91 Open
Chipping_Line_017 361.96 4.16 10.88 Open
Chipping_Line_018 334.59 3.85 9.41 Open
Chipping_Line_019 322.04 3.43 7.29 Open
Chipping_Line_020 242.24 2.58 4.30 Open
Chipping_Line_021 3327.68 4.80 4.22 Open
Chipping_Line_022 3133.88 4.52 3.77 Open
Chipping_Line_023 2882.51 4.16 3.23 Open
Chipping_Line_024 889.77 3.60 4.52 Open
Chipping_Line_024b 2880.80 4.15 3.23 Open
Crag_Rat_Line_000 1050.49 4.41 6.71 Open
Crag_Rat_Line_001 472.50 3.21 4.94 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Crag_Rat_Line_002a 725.59 4.93 10.98 Open
Crag_Rat_Line_002b 725.59 4.93 10.98 Open
Crag_Rat_Line_003 293.53 4.19 12.49 Open
Crag_Rat_Line_004 178.97 4.71 22.17 Open
Crag_Rat_Line_006 53.01 1.27 1.85 Open
Crag_Rat_Line_007 259.90 2.77 4.90 Open
Crag_Rat_Line_008 62.69 1.44 2.30 Open
Crag_Rat_Line_009 25.64 0.59 0.44 Open
Crag_Rat_Line_010 125.96 3.14 10.11 Open
Crag_Rat_Line_011 23.93 0.60 0.47 Open Crag_Rat_Line_012 33.63 0.78 0.74 Open
Crag_Rat_Line_013 5.70 0.13 0.03 Open Dethman/Swyers_Line_000a 826.79 4.48 8.05 Open
Dethman/Swyers_Line_003 397.01 4.23 10.74 Open Dethman/Swyers_Line_008 429.79 4.58 12.44

Open Dethman/Swyers_Line_011 93.49 2.15 4.82 Open Dethman_Ridge_Line_000 8801.12 4.57 2.13 Open Dethman_Ridge_Line_001a 8301.80 4.66 2.31 Open Dethman_Ridge_Line_002 8556.02 4.45 2.02 Open Dethman_Ridge_Line_003 8283.57 4.65 2.31 Open Dethman_Ridge_Line_004 8260.20 4.64 2.29 Open Dethman_Ridge_Line_005 8232.83 4.62 2.27 Open Dethman_Ridge_Line_006 8232.83 4.62 2.27 Open Dethman_Ridge_Line_007 8069.25 4.53 2.19 Open Dethman_Ridge_Line_008 8009.39 4.78 2.50 Open Dethman_Ridge_Line_009 7825.27 4.67 2.39 Open Dethman_Ridge_Line_010 7813.87 4.66 2.39 Open Dethman_Ridge_Line_011 6790.71 4.70 2.64 Open Dethman_Ridge_Line_012 6790.71 4.70 2.64 Open Dethman_Ridge_Line_013 6611.15 4.57 2.51 Open Dethman_Ridge_Line_014 5952.49 4.83 3.05 Open Dethman_Ridge_Line_015 5952.49 4.83 3.05 Open Dethman_Ridge_Line_016 5768.96 4.68 2.88 Open Dethman_Ridge_Line_017 5625.33 4.73 3.00 Open Dethman_Ridge_Line_018 5454.33 4.59 2.83 Open Dethman_Ridge_Line_019 5309.84 4.31 2.47 Open Dethman_Ridge_Line_020 2061.67 4.92 5.91 Open Dethman_Ridge_Line_021 1842.79 4.39 4.80 Open Dethman_Ridge_Line_022 1757.29 4.19 4.40 Open Dethman_Ridge_Line_023 1474.57 4.24 5.01 Open Dethman_Ridge_Line_024 1389.64 4.14 4.90 Open Dethman_Ridge_Line_025 1283.06 3.82 4.22 Open Dethman_Ridge_Line_027 129.97 3.11 9.75 Open Dethman_Ridge_Line_028 48.44 1.16 1.56 Open Dethman_Ridge_Line_029 48.44 1.16 1.57 Open Dethman_Ridge_Line_030 245.38 2.89 5.61 Open Dethman_Ridge_Line_031 85.78 1.98 4.11 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Dethman_Ridge_Line_032 25.64 0.59 0.44 Open Dethman_Ridge_Line_034 375.93 4.01 9.71 Open Dethman_Ridge_Line_035 210.34 4.85 21.65 Open Dethman_Ridge_Line_036 369.36 4.08 10.25 Open Dethman_Ridge_Line_037 165.59 3.82 12.21 Open Dethman_Ridge_Line_038 165.59 3.82 13.91 Open Dethman_Ridge_Line_039 53.01 1.22 1.69 Open Dethman_Ridge_Line_042 47.59 1.10 1.38 Open Dethman_Ridge_Line_043 190.94 4.57 19.87 Open Dethman_Ridge_Line_044 828.21 3.35 3.95 Open Dethman_Ridge_Line_045 715.64 4.66 9.63 Open Dethman_Ridge_Line_046 715.64 4.50 8.84 Open Dethman_Ridge_Line_047 603.63 4.11 7.81 Open Dethman_Ridge_Line_048 418.94 4.82 14.26 Open Dethman_Ridge_Line_049 4933.90 4.00 2.15 Open Dethman_Ridge_Line_050 4825.32 3.91 2.07 Open Dethman_Ridge_Line_051 4447.13 3.61 1.78 Open Dethman_Ridge_Line_052 2140.08 4.05 3.60 Open Dethman_Ridge_Line_053 1744.49 4.16 4.34 Open Dethman_Ridge_Line_054 2385.46 4.35 4.04 Open Dethman_Ridge_Line_055 913.70 3.83 5.18 Open Dethman_Ridge_Line_056 913.70 4.00 5.75 Open Dethman_Ridge_Line_057 597.37 4.06 7.66 Open Dethman_Ridge_Line_058 909.71 3.98 5.71 Open Dethman_Ridge_Line_059 598.50 4.07 7.68 Open Dethman_Ridge_Line_060 320.91 3.55 7.90 Open Dethman_Ridge_Line_061 1739.36 4.30 4.70 Open Dethman_Ridge_Line_062 116.29 2.68 7.22 Open Dethman_Ridge_Line_063 2.86 0.07 0.01 Open Dethman_Ridge_Line_064 91.20 2.10 4.60 Open Dukes_Valley_Canal_000 10800.46 4.93 2.27 Open Dukes_Valley_Canal_001 9511.71 4.71 2.18 Open Dukes_Valley_Canal_002 9432.49 4.67 2.15 Open Dukes_Valley_Canal_003 9413.10 4.66 2.14 Open Dukes_Valley_Canal_004 9398.29 4.65 2.13 Open Dukes_Valley_Canal_005 9392.58 4.65 2.13 Open Dukes_Valley_Canal_006 9134.93 4.52 2.02 Open Dukes_Valley_Canal_007 8987.30 4.45 1.96 Open Dukes_Valley_Canal_008 9253.50 4.58 2.07 Open Dukes_Valley_Canal_009 8023.44 4.51 2.16 Open Dukes_Valley_Canal_010 8983.89 4.45 1.96 Open Dukes_Valley_Canal_011 8951.97 4.43 1.95 Open Dukes_Valley_Canal_012 8796.94 4.94 2.57 Open Dukes_Valley_Canal_013 8711.44 4.89 2.52 Open Dukes_Valley_Canal_014 8090.42 4.54 2.20 Open Dukes_Valley_Canal_015 8006.34 4.50 2.16 Open Dukes_Valley_Canal_016 8006.34 4.50 2.16 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Dukes_Valley_Canal_017 7929.96 4.45 2.12 Open Dukes_Valley_Canal_018 7883.23 4.43 2.10 Open Dukes_Valley_Canal_019 10225.90 4.47 1.84 Open Dukes_Valley_Canal_020 10225.90 4.47 1.84 Open Dukes_Valley_Canal_021 10162.07 4.44 1.82 Open Dukes_Valley_Canal_022 9581.83 4.74 2.21 Open Dukes_Valley_Canal_023 10048.07 4.97 2.41 Open Dukes_Valley_Canal_024 9656.50 4.78 2.24 Open Dukes_Valley_Canal_025 9893.04 4.90 2.34 Open Dukes_Valley_Canal_026 9809.83 4.85 2.31 Open Dukes_Valley_Pipeline_000a 10294.30 4.57 1.93 Open Dukes_Valley_Pipeline_000b 10294.30 4.70 1.74 Open Dukes_Valley_Pipeline_001 10225.90 4.47 1.84 Open Dukes_Valley_Pipeline_002 10800.46 4.93 2.27 Open Dunphin/Castaneda_Line_000 254.21 2.71 4.70 Open Eastside_Auxillary_000 220.56 2.35 3.62 Open Eastside_Auxillary_001 220.56 2.54 4.35 Open Eastside_Auxillary_002 218.00 2.51 4.25 Open Eastside_Auxillary_003 214.86 3.60 10.33 Open Eastside_Auxillary_003b 180.66 4.33 17.93 Open Eastside_Auxillary_004 162.99 3.90 14.82 Open Eastside_Auxillary_005 161.86 3.88

14.63 Open Eastside_Auxillary_006 160.73 3.85 14.44 Open Eastside_Auxillary_007 145.91 3.49 12.07 Open Eastside_Auxillary_008 142.50 3.41 11.56 Open Eastside_Canal_000 18517.73 4.77 1.52 Open Eastside_Canal_000_1 18517.73 4.77 1.52 Open Eastside_Canal_002 18514.87 4.77 1.52 Open
Eastside_Canal_003 18433.36 4.75 1.51 Open
Eastside_Canal_006 18446.47 4.75 1.51 Open
Eastside_Canal_007 18370.66 4.73 1.50 Open
Eastside_Canal_008 18326.77 4.72 1.50 Open
Eastside_Canal_009 18310.80 4.71 1.49 Open
Eastside_Canal_010 18184.27 4.99 1.72 Open
Eastside_Canal_011 18182.56 4.99 1.72 Open
Eastside_Canal_012 18152.93 4.98 1.72 Open
Eastside_Canal_013 18061.73 4.96 1.70 Open
Eastside_Canal_014 17937.46 4.92 1.68 Open
Eastside_Canal_015 17937.46 4.92 1.68 Open
Eastside_Canal_016 4026.91 3.53 6.10 Open Eastside_Canal_017 4026.91 3.53 1.79 Open
Eastside_Canal_018 3898.09 4.93 4.10 Open
Eastside_Canal_019 3760.16 4.55 3.45 Open
Eastside_Canal_020 7843.62 4.84 2.61 Open
Eastside_Canal_021 7765.53 4.80 2.57 Open
Eastside_Canal_022 7479.40 4.62 2.39 Open
Eastside_Canal_023 7362.27 4.55 2.33 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Eastside_Canal_025 7181.00 4.43 2.21 Open
Eastside_Canal_026 15654.32 4.30 1.31 Open
Eastside_Canal_027 15591.62 4.28 1.30 Open Eastside_Canal_028 15449.69 4.24 1.27 Open
Eastside_Canal_029 14913.32 4.09 1.19 Open
Eastside_Canal_030 14539.41 3.99 0.00 Open
Eastside_Canal_031 14887.68 4.09 1.19 Open
Eastside_Canal_032 14472.15 3.97 1.13 Open
Eastside_Canal_033 14187.72 3.89 1.09 Open
Eastside_Canal_034 14176.32 3.89 1.09 Open
Eastside_Canal_035 6057.81 4.53 2.58 Open
Eastside_Canal_036 5571.02 4.89 3.26 Open
Eastside_Canal_037 5488.94 4.81 3.17 Open
Eastside_Canal_038 4516.81 3.96 2.21 Open
Eastside_Canal_039 4169.68 3.66 1.91 Open
Eastside_Canal_041 2898.89 4.52 3.96 Open
Eastside_Canal_042 17931.76 4.92 1.68 Open
Eastside_Canal_043 17507.11 4.81 1.61 Open
Eastside_Canal_044 17513.94 4.81 1.61 Open Eastside_Canal_045 17507.11 4.81 1.61 Open
Eastside_Canal_046 17450.69 4.79 1.60 Open
Eastside_Canal_047 17484.88 4.80 1.60 Open
Eastside_Canal_048 17494.00 4.80 1.60 Open
Eastside_Canal_049 13125.83 4.91 2.00 Open
Eastside_Canal_050 13037.20 4.87 1.97 Open
Eastside_Canal_051 13048.60 4.88 1.97 Open
Eastside_Canal_052 13031.50 4.87 1.97 Open
Eastside_Canal_053 12869.04 4.81 1.93 Open
Eastside_Canal_054 12667.25 4.73 1.87 Open
Eastside_Canal_055 12343.21 4.61 12.21 Open
Eastside_Canal_056 12561.24 4.69 1.84 Open
Eastside_Canal_057 12343.21 4.61 1.78 Open
Ehrentraut_000 5.70 0.14 0.03 Open
Fisher_Line_000 156.19 3.99 16.00 Open
Fisher_Line_001 156.19 3.60 12.47 Open Fisher_Line_002 156.19 3.60 12.47 Open
Gilkerson_Line_000 401.84 4.28 10.98 Open
Gilkerson_Line_001 210.90 4.86 21.74 Open
Gilkerson_Line_002 7.99 0.22 0.08 Open
Gilkerson_Line_003 373.34 3.98 9.69 Open Gilkerson_Line_004a 360.23 4.37 12.31 Open
Gilkerson_Line_004b 360.23 3.84 8.99 Open Gilkerson_Line_005 7.99 0.20 0.06 Open
Highline_Canal_000 88.64 2.04 4.37 Open
Hukari_Line_000 203.49 3.64 10.97 Open

Hukari_Line_002 102.60 2.56 6.92 Open
Hukari_Line_003 100.89 2.42 6.10 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status ID GPM fps ft/Kft -- Kellly_Line_000a 142.78 3.10 9.11 Open
Kellly_Line_001 142.78 3.42 11.60 Open
Kennedy_Line_000 242.24 2.68 4.69 Open
Lariza_Line_000a 414.39 4.42 11.62 Open
Lariza_Line_001 5.70 0.13 0.04 Open
Lenz_Butte_Line_000 1023.17 4.14 5.85 Open Lenz_Butte_Line_001 1023.17 4.14 5.85 Open
Lenz_Butte_Line_002 1023.17 4.14 5.85 Open Lenz_Butte_Line_003 971.87 3.93 5.32 Open
Lenz_Butte_Line_004 1023.17 4.14 5.85 Open Lenz_Butte_Line_005 917.71 3.71 4.78 Open
Lenz_Butte_Line_006 363.38 4.02 9.95 Open Lenz_Butte_Line_007 5.70 0.13 0.03 Open
Lenz_Butte_Line_008 5.70 0.13 0.03 Open Lenz_Butte_Line_010 424.38 4.52 12.15 Open
Lenz_Butte_Line_011 424.38 4.52 12.15 Open Lenz_Butte_Line_012 374.21 3.99 9.62 Open
Lenz_Butte_Line_013 5.13 0.12 0.02 Open Lenz_Butte_Line_014 10.83 0.25 0.09 Open
Loop_Line_000 10.55 0.24 0.08 Open
Loop_Line_001 112.01 2.68 7.40 Open
Loop_Line_001a 2758.52 3.98 2.98 Open
Loop_Line_002 36.49 0.91 1.02 Open
Loop_Line_003 197.79 4.93 23.33 Open
Loop_Line_004 197.21 4.91 23.20 Open
Loop_Line_005 98.03 2.44 6.36 Open
Loop_Line_006 540.92 3.52 5.73 Open
Loop_Line_007 144.76 3.47 11.89 Open
Loop_Line_008 144.76 3.61 13.09 Open
Loop_Line_009 1.13 0.03 0.00 Open Loop_Line_010 234.27 2.69 4.86 Open
Loop_Line_011 1352.88 4.03 4.66 Open
Loop_Line_012 1352.88 4.03 4.66 Open
Loop_Line_013 1251.99 3.73 4.04 Open
Loop_Line_014 1095.81 4.60 7.25 Open
Loop_Line_015 985.22 4.13 5.96 Open
Loop_Line_016 984.09 4.13 5.94 Open
Loop_Line_017 443.18 4.42 11.19 Open
Loop_Line_020 2634.83 4.81 4.86 Open
Loop_Line_021 4499.58 3.95 2.20 Open
Loop_Line_022 4243.64 3.72 1.97 Open
Loop_Line_023 3437.95 4.34 3.25 Open
Loop_Line_024a 2767.64 4.33 3.66 Open
Loop_Line_024b 2767.64 3.99 2.99 Open
Loop_Line_025 4445.43 3.90 2.15 Open
Loop_Line_026 869.26 3.52 4.33 Open
Loop_Line_027 117.14 2.70 7.32 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Loop_Line_028 117.14 2.70 7.32 Open
Loop_Line_029 2447.86 4.63 4.62 Open
Loop_Line_030 1094.98 4.59 7.24 Open
Loop_Line_035 113.72 2.72 7.61 Open
Loop_Line_036 9.11 0.21 0.06 Open
Loop_Line_038 2624.29 4.96 5.25 Open Lower_Highline_Pressure_001 601.33 3.78 6.40 Open
Lower_Highline_Pressure_003 388.72 4.14 10.33 Open Lower_Highline_Pressure_005 601.33 3.78 6.40 Open Lower_Highline_Pressure_006 204.34 4.71 20.52 Open
Lower_Highline_Pressure_007 145.64 3.36 10.96 Open Lower_Highline_Pressure_008 140.79 3.24 10.29 Open Lower_Highline_Pressure_009 200.35 4.62 19.80 Open
Lower_Highline_Pressure_014 133.37 3.07 9.31 Open Lower_Highline_Pressure_015 127.67 2.94 8.58 Open Lower_Highline_Pressure_016 24.23 0.58 0.43 Open Lower_Highline_Pressure_017 53.00 1.32 2.04 Open Lower_Highline_Pressure_018 50.44 1.16 1.54 Open
Lower_Highline_Pressure_019 41.32 1.03 1.28 Open Lower_Highline_Pressure_020a 367.35 4.06 10.15 Open Lower_Highline_Pressure_021 343.42 3.79 8.96 Open Lower_Highline_Pressure_024

9.69 0.23 0.08 Open Lower_Highline_Pressure_025 9.69 0.24 0.09 Open
Lower_Highline_Pressure_027 232.84 2.68 4.81 Open Lower_Highline_Pressure_028a 216.02
3.78 11.65 Open Main_Canal_001 30843.67 4.80 1.15 Open
Main_Canal_002 30826.57 4.80 1.15 Open
Main_Canal_003 27925.55 4.35 0.96 Open
Main_Canal_004 27922.69 4.35 0.96 Open
Main_Canal_005 25021.67 3.90 0.78 Open
Main_Canal_006 24930.47 4.92 1.38 Open
Main_Canal_007 24927.06 4.91 1.38 Open
Main_Canal_008 24901.97 4.91 1.38 Open
Main_Canal_009 24819.89 4.89 1.37 Open
Main_Canal_010 24700.19 4.87 1.36 Open
Main_Canal_011 24456.78 4.82 1.33 Open
Main_Canal_012 24392.59 4.81 1.33 Open
Main_Canal_013 24698.47 4.87 0.00 Open
Main_Canal_014 24696.76 4.87 1.36 Open
Main_Canal_015 24666.55 4.86 1.35 Open Main_Canal_016 24666.55 4.86 1.35 Open
Main_Canal_017 24343.29 4.80 1.32 Open
Main_Canal_018 24320.48 4.80 1.32 Open
Main_Canal_019 24261.77 4.78 1.31 Open
Main_Canal_021 22281.04 4.39 1.12 Open
Main_Canal_022 22218.90 4.38 0.00 Open
Main_Canal_023 22217.18 4.38 1.12 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft ---
Main_Canal_024 22221.75 4.38 1.10 Open
Main_Canal_025 22275.34 4.39 1.12 Open
Main_Canal_026 22270.77 4.39 1.12 Open Main_Canal_027 22200.08 4.38 1.11 Open
Main_Canal_028 22196.67 4.38 1.11 Open
Main_Canal_029 22193.25 4.38 1.12 Open
Main_Canal_030 22187.55 4.37 1.11 Open
Main_Canal_031 22144.12 4.37 1.11 Open
Main_Canal_032 22139.00 4.37 1.11 Open
Main_Canal_033 21884.20 4.31 1.08 Open
Main_Canal_034 21883.07 4.31 1.08 Open
Main_Canal_036 21879.08 4.31 1.08 Open
Main_Canal_037a 50709.79 4.76 0.84 Open
Main_Canal_037b 50709.79 4.76 0.00 Open Dukes_Valley_Pipeline_002a 10800.46 4.93 6.10
Open Main_Canal_039 23130.92 4.56 1.20 Open
Main_Canal_041 23951.13 4.72 1.28 Open
Main_Canal_042 23939.73 4.72 1.28 Open
Main_Canal_043 23919.21 4.72 1.28 Open Main_Canal_044 23900.40 4.71 1.28 Open
Main_Canal_045 23872.47 4.71 1.27 Open
Main_Canal_046 23559.54 4.65 1.24 Open
Main_Canal_047 23816.60 4.70 1.27 Open
Main_Canal_048 23690.07 4.67 1.26 Open
Main_Canal_049 23729.97 4.68 1.26 Open
Main_Canal_050 23615.97 4.66 1.25 Open
Main_Canal_051 23562.96 4.65 1.24 Open
Main_Canal_052 23538.45 4.64 1.24 Open
Main_Canal_053 23538.45 4.64 1.24 Open
Main_Canal_054 24105.58 4.75 1.30 Open
Main_Canal_055 24090.77 4.75 1.30 Open
Main_Canal_056 24041.76 4.74 1.29 Open
Main_Canal_057 24018.96 4.74 1.29 Open
Main_Canal_058 23977.34 4.73 1.28 Open Main_Canal_Tavern_Chute_000 21886.48 4.32 1.09
Open Main_Canal_Tavern_Chute_001 21884.20 4.31 1.08 Open Marsh/Chamberlin_Line_000
5235.57 4.59 2.90 Open Marsh/Chamberlin_Line_001 5229.87 4.59 2.90 Open Marsh/
Chamberlin_Line_002a 6053.27 4.91 3.15 Open Marsh/Chamberlin_Line_003 5737.77 4.83 3.11
Open Marsh/Chamberlin_Line_004 3113.95 4.86 4.52 Open Marsh/Chamberlin_Line_005 2980.00
4.65 4.16 Open Marsh/Chamberlin_Line_006 2974.30 4.64 4.15 Open Marsh/
Chamberlin_Line_007a 2893.37 4.51 3.94 Open Marsh/Chamberlin_Line_008 5737.77 4.29 2.33
Open Marsh/Chamberlin_Line_009 5737.77 4.29 2.33 Open Marsh/Chamberlin_Line_011 5224.17
4.58 2.90 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Marsh/Chamberlin_Line_012 5212.77 4.57 2.89 Open Marsh/Chamberlin_Line_013 0.00 0.00 0.00 Open Marsh/Chamberlin_Line_014 5737.77 4.29 2.33 Open Mathieson_Line_000 67.26 1.77 3.62 Open
Mathieson_Line_001 3.99 0.09 0.02 Open
Mathieson_Line_002 9.69 0.22 0.07 Open Mobile_Home_Line_000 145.34 2.89 7.64 Open
Mobile_Home_Line_001 77.51 1.79 3.41 Open Mobile_Home_Line_002 77.51 1.79 3.41 Open
Mobile_Home_Line_003 25.64 0.59 0.44 Open Mud_Alley_Line_000 28.50 0.71 0.64 Open
Mud_Alley_Line_001 4.57 0.11 0.02 Open
Mud_Alley_Line_002 52.73 1.31 2.02 Open
Nafsinger_Line_000 31.36 0.72 0.64 Open
Nafsinger_Line_001 11.40 0.26 0.10 Open
Nafsinger_Line_002 17.10 0.39 0.21 Open
Nafsinger_Line_003 22.80 0.53 0.35 Open
Nafsinger_Line_004 31.36 0.72 0.63 Open
Nafsinger_Line_005 127.13 3.62 14.21 Open
Nafsinger_Line_006 31.36 0.78 0.77 Open Neal_Creek_Lateral_000 157.89 3.78 13.97 Open
Neal_Creek_Lateral_001 157.89 3.78 13.97 Open Neal_Mill_Line_000 250.23 2.67 4.57 Open
Neal_Mill_Line_001 14.24 0.33 0.15 Open
Neal_Mill_Line_002 658.66 4.59 9.71 Open
Neal_Mill_Line_003 392.18 4.18 10.50 Open
Neal_Mill_Line_004 142.50 3.28 10.53 Open Neal_Mill_Line_005 144.79 3.34 10.84 Open
Neal_Mill_Line_006 389.33 4.15 10.36 Open
Neal_Mill_Line_007 166.46 3.84 14.03 Open
Neal_Mill_Line_008 21.67 0.50 0.32 Open
Neal_Mill_Line_009 16.25 0.37 0.19 Open
Neal_Mill_Line_010 642.41 4.04 7.24 Open
Neufeldt_Line_000a 271.89 3.30 7.31 Open
Neufeldt_Line_001 271.89 3.13 6.40 Open
Nunamaker_Line_000 909.16 3.81 5.13 Open Nunamaker_Line_001a 738.16 4.00 6.52 Open
Nunamaker_Line_002 600.23 3.91 6.95 Open
Nunamaker_Line_003 600.23 3.77 6.38 Open
Nunamaker_Line_004 600.23 3.91 6.95 Open
Nunamaker_Line_005 491.36 3.34 5.33 Open
Nunamaker_Line_006 435.49 4.44 11.43 Open
Nunamaker_Line_007 369.37 3.94 9.39 Open Nunamaker_Line_008 369.37 3.94 9.39 Open
Nunamaker_Line_009 369.37 3.94 9.39 Open
Nunamaker_Line_010 233.14 2.49 4.01 Open
Nunamaker_Line_011 233.14 2.49 4.01 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Nunamaker_Line_012 224.59 2.39 3.74 Open
Nunamaker_Line_013 216.03 3.62 10.44 Open
Nunamaker_Line_014 213.74 3.58 10.23 Open
Nunamaker_Line_015 195.51 4.68 20.76 Open
Nunamaker_Line_016 184.11 4.41 18.57 Open
Nunamaker_Line_017 66.67 1.60 2.83 Open Nunamaker_Line_018 87.48 2.10 4.68 Open
Nunamaker_Line_019 118.27 2.83 8.18 Open
Nunamaker_Line_020 170.43 4.08 16.10 Open
Nunamaker_Line_021 170.43 4.08 16.10 Open
Nunamaker_Line_022 146.19 3.50 12.12 Open
Nunamaker_Line_023 132.51 3.17 10.10 Open
Nunamaker_Line_024 81.78 1.96 4.13 Open
Nunamaker_Line_025 65.54 1.63 3.02 Open
Nunamaker_Line_026 15.11 0.36 0.18 Open
Nunamaker_Line_027 137.93 3.18 9.91 Open
Oanna_000a 11403.75 4.55 1.81 Open
Oanna_000b 11403.75 4.61 0.00 Open
Oanna_001 10742.54 4.91 2.24 Open

Oanna_002 10742.54 4.91 2.24 Open
Oanna_003 10742.54 4.50 1.82 Open
Oanna_004 10641.07 4.46 1.44 Open Oanna_006 9731.92 4.82 2.27 Open
Oanna_007 9731.92 4.82 2.30 Open
Oanna_008 562.59 3.83 6.85 Open
Oanna_009b 8801.12 4.94 2.56 Open
Oanna_010 300.39 3.45 7.44 Open
Oanna_011a 368.21 4.23 11.60 Open
Oanna_012 368.21 4.23 11.23 Open
Oanna_013 9169.33 4.54 2.03 Open
Omori_Line_001 1000.91 4.05 5.61 Open
Omori_Line_002 375.63 4.15 10.58 Open
Omori_Line_003 295.83 3.27 6.80 Open
Omori_Line_004 102.03 2.44 6.22 Open
Omori_Line_005 50.73 1.21 1.71 Open
Paasch_Line_000 972.12 4.84 8.82 Open
Paasch_Line_001 407.56 4.69 13.55 Open
Paasch_Line_002 613.33 4.17 8.04 Open
Paasch_Line_003 913.99 3.70 4.75 Open Paasch_Line_005 802.56 3.51 4.52 Open
Poole_Line_000 302.39 3.48 7.78 Open
Poole_Line_001 302.39 3.67 8.90 Open
Poole_Line_002 172.71 4.30 18.15 Open
Poole_Line_003 91.20 2.27 5.56 Open
Rasmussen_Line_001 1796.36 4.44 4.80 Open
Rasmussen_Line_002 1776.42 4.58 5.42 Open Rasmussen_Line_003a 1501.68 4.80 6.73 Open

Link Results: (continued) --
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Rasmussen_Line_004 1225.23 4.96 8.17 Open
Rasmussen_Line_005 690.84 4.34 8.28 Open Rasmussen_Line_007 668.04 4.35 8.47 Open
Rasmussen_Line_008 493.63 3.21 4.83 Open
Rasmussen_Line_009 57.00 1.37 2.12 Open
Rasmussen_Line_010 424.38 4.69 13.26 Open
Rasmussen_Line_011 408.41 4.51 12.35 Open
Rasmussen_Line_012 408.41 4.51 12.35 Open
Rasmussen_Line_013 394.16 4.36 11.56 Open
Rasmussen_Line_014 258.79 2.86 5.30 Open
Rasmussen_Line_015 258.79 2.86 5.30 Open
Rasmussen_Line_016 258.79 2.86 5.30 Open
Rasmussen_Line_017 249.10 2.75 4.94 Open
Rasmussen_Line_018 232.00 2.56 4.33 Open
Rasmussen_Line_019 222.88 2.46 4.02 Open
Rasmussen_Line_020 118.86 2.85 8.26 Open
Rasmussen_Line_021 97.19 2.33 5.69 Open
Rasmussen_Line_022 436.63 4.82 13.97 Open Rasmussen_Line_023 359.11 3.97 9.73 Open
Rasmussen_Line_024 353.41 3.91 9.45 Open
Rasmussen_Line_025 291.84 3.36 7.30 Open
Rasmussen_Line_026 178.41 4.44 19.27 Open
Rasmussen_Line_027 178.41 4.44 19.27 Open
Rasmussen_Line_029 178.41 4.44 19.27 Open
Rasmussen_Line_030 22.80 0.53 0.35 Open
Rasmussen_Line_031 104.02 2.49 6.45 Open
Rasmussen_Line_032 72.11 1.80 3.60 Open
Rasmussen_Line_034 16.53 0.41 0.24 Open
Rasmussen_Line_035 3.41 0.09 0.01 Open
Rasmussen_Line_036 54.44 1.30 1.95 Open
Rasmussen_Line_037 49.59 1.19 1.64 Open
Rasmussen_Line_038 97.19 2.33 5.69 Open
Rasmussen_Line_039 274.74 3.16 6.53 Open
Rasmussen_Line_040 202.36 3.54 10.33 Open Rasmussen_Line_041 174.41 4.18 16.80 Open
Rock_Acres_Line_000 502.20 3.42 5.55 Open Rock_Acres_Line_001 502.20 3.42 5.55 Open
Rock_Acres_Line_002 226.59 2.42 3.80 Open Rock_Acres_Line_003 225.45 2.49 4.11 Open
Rock_Acres_Line_004 226.02 2.50 4.13 Open Rock_Acres_Line_005 220.88 2.44 3.96 Open
Rock_Acres_Line_006 199.79 4.78 21.62 Open Rock_Acres_Line_007 71.26 1.71 3.20 Open
Rock_Acres_Line_008 80.37 1.92 4.00 Open Rock_Acres_Line_009 203.78 4.88 22.44 Open

Rock_Acres_Line_013 71.26 1.71 3.20 Open
Shaw_Line_000 59.86 1.49 2.55 Open

Link Results: (continued) --- Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Shaw_Line_003 76.39 1.90 4.01 Open
Shaw_Line_004 13.39 0.33 0.16 Open
Shaw_Line_005 493.34 3.36 5.37 Open
Shaw_Line_006 349.99 4.02 10.23 Open
Shaw_Line_007 395.31 4.55 12.81 Open
Shaw_Line_008 310.94 3.58 8.21 Open
Shaw_Line_009 281.31 3.24 6.82 Open
Shaw_Line_010 166.46 4.15 16.95 Open
Shaw_Line_011 336.59 3.87 9.51 Open
Shaw_Line_012 328.04 3.77 9.07 Open
Shaw_Line_013 336.59 3.87 9.51 Open Sheirbon_Hill_Line_000 621.02 4.22 8.24 Open Sheirbon_Hill_Line_002a 609.62 4.71 10.86 Open Sheirbon_Hill_Line_003 481.94 3.03 4.25 Open Sheirbon_Hill_Line_004 481.94 3.03 4.25 Open Sheirbon_Hill_Line_005 581.12 3.65 6.01 Open Sheirbon_Hill_Line_006 333.74 3.56 7.78 Open Sheirbon_Hill_Line_007 134.81 3.23 10.43 Open Sheirbon_Hill_Line_008 198.93 4.58 19.52 Open Sheppard_Ditch_000 388.74 4.72 14.18 Open
Sheppard_Ditch_001 222.87 2.56 4.43 Open
Sheppard_Ditch_002 222.87 2.38 3.69 Open
Sheppard_Ditch_003 388.74 4.58 13.15 Open
Sheppard_Line_000b 110.59 2.55 6.58 Open Sherrard_Road_Line_000 97.47 2.43 6.29 Open
Shute_Road_Line_000 391.57 4.17 10.47 Open Shute_Road_Line_001 380.17 4.37 11.92 Open
Shute_Road_Line_002 377.32 4.34 11.75 Open Shute_Road_Line_003 376.75 4.16 10.63 Open
Shute_Road_Line_004 373.33 4.13 10.46 Open Shute_Road_Line_005 284.42 3.14 6.32 Open
Summit_Road_Line_000 45.60 1.05 1.28 Open Summit_Road_Line_001 52.43 1.21 1.65 Open
Summit_Road_Line_002 660.63 4.15 7.62 Open Summit_Road_Line_003 111.14 2.56 6.64 Open
Summit_Road_Line_004 111.14 2.66 7.29 Open Summit_Road_Line_005 80.36 1.85 3.64 Open
Summit_Road_Line_006 660.63 4.15 7.62 Open Summit_Road_Line_007 525.24 3.30 4.98 Open
Summit_Road_Line_008 462.26 4.93 14.23 Open Summit_Road_Line_009 546.91 3.44 5.37 Open
Summit_Road_Line_010 546.91 3.44 5.37 Open Summit_Road_Line_011 457.98 4.88 13.99 Open
Summit_Road_Line_012 412.38 4.40 11.52 Open Summit_Road_Line_013 370.77 3.95 9.46 Open
Summit_Road_Line_014 318.34 3.39 7.13 Open Summit_Road_Line_015 288.40 3.07 5.81 Open

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
Summit_Road_Line_016 191.50 4.41 18.20 Open
Sweet_Line_000 29.93 0.72 0.64 Open
Sweet_Line_001 285.57 3.04 5.83 Open
Sweet_Line_002 82.09 1.89 3.79 Open
Sweet_Line_003 51.30 1.18 1.59 Open
Sweet_Line_004 315.51 3.36 7.01 Open Sweet_Line_005 315.51 3.36 7.02 Open
Sweet_Line_006 203.49 4.69 20.36 Open
Sweet_Line_007 92.33 2.13 4.71 Open
Tallman_Line_000a 1.71 0.05 0.00 Open
Thomsen_Line_000 861.27 4.67 8.68 Open
Thomsen_Line_001a 861.27 3.48 4.25 Open
Thomsen_Line_002 205.77 3.60 10.64 Open
Thomsen_Line_003 99.19 2.47 6.50 Open
Thomsen_Line_006 655.50 4.12 7.52 Open
Thomsen_Line_007 151.61 3.49 11.71 Open
Tiffany_Line_000a 11.68 0.31 0.14 Open
Webb_Drive_Line_000 154.46 3.70 13.42 Open Webb_Drive_Line_001 148.76 3.56 12.51 Open
Webb_Drive_Line_002 80.93 2.02 4.46 Open Webb_Drive_Line_003 111.71 2.78 8.10 Open
Webb_Drive_Line_004 143.06 3.43 11.64 Open Webb_Drive_Line_005 117.41 2.81 8.07 Open
Webb_Drive_Line_006 29.64 0.71 0.63 Open Webb_Drive_Line_007 5.70 0.13 0.03 Open
Webb_Drive_Line_008 14.26 0.34 0.16 Open Webb_Drive_Line_009 11.40 0.27 0.11 Open
Webb_Drive_Line_010 195.50 4.68 20.76 Open Webb_Drive_Line_011 210.32 3.52 9.93 Open
Webb_Drive_Line_012 165.86 3.97 15.31 Open Webster_Pressure_Line_000 911.15 3.69 4.72

Open Webster_Pressure_Line_001 336.30 3.87 9.50 Open Webster_Pressure_Line_002 125.97 3.14 10.12 Open Webster_Pressure_Line_003 324.90 3.74 8.91 Open Webster_Pressure_Line_004 210.33 3.52 9.93 Open Webster_Pressure_Line_005 911.15 3.69 4.71 Open Wheeler_Road_Line_000 38.77 0.97 1.14 Open Wheeler_Road_Line_001 35.91 0.89 0.99 Open Wheeler_Road_Line_002 273.32 3.02 5.87 Open Wheeler_Road_Line_003 178.41 4.27 17.52 Open Wheeler_Road_Line_004 275.03 2.93 5.44 Open Whiskey_Creek_Pipeline_001 1304.13 4.17 5.18 Open Whiskey_Creek_Pipeline_002 1252.83 3.99 4.75 Open Whiskey_Creek_Pipeline_003 1177.02 4.76 7.58 Open Whiskey_Creek_Pipeline_004 914.25 3.70 4.75 Open Whiskey_Creek_Pipeline_005 914.25 3.83 5.19 Open Whiskey_Creek_Pipeline_006 658.93 4.48 9.18 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Whiskey_Creek_Pipeline_007 645.24 4.39 8.83 Open Whiskey_Creek_Pipeline_009 503.87 3.43 5.59 Open Whiskey_Creek_Pipeline_010 503.87 3.43 5.59 Open Whiskey_Creek_Pipeline_012 710.76 4.63 9.50 Open Whiskey_Creek_Pipeline_013 699.36 4.40 8.47 Open Whiskey_Creek_Pipeline_014 658.33 4.58 9.70 Open Whiskey_Creek_Pipeline_015 601.33 3.78 6.40 Open Whiskey_Creek_Pipeline_016a 2898.89 4.17 3.24 Open Whiskey_Creek_Pipeline_017 2112.83 4.17 3.91 Open Whiskey_Creek_Pipeline_018 2022.21 3.99 3.61 Open Whiskey_Creek_Pipeline_019 2027.91 4.01 3.63 Open Whiskey_Creek_Pipeline_020 1916.76 4.94 6.24 Open Whiskey_Creek_Pipeline_021 1502.38 4.67 6.29 Open Whiskey_Creek_Pipeline_022 1450.51 4.51 5.89 Open Whiskey_Creek_Pipeline_023 1450.51 4.51 5.89 Open Whitesell_East_000 13.69 0.34 0.17 Open
Whitesell_West_000 24.23 0.60 0.48 Open Winklebleck_Line_000 527.84 3.59 6.09 Open Winklebleck_Line_001a 478.83 3.43 5.77 Open Winklebleck_Line_002 473.13 2.98 4.11 Open Winklebleck_Line_003 442.34 4.89 14.32 Open Winklebleck_Line_004 394.46 4.54 12.76 Open Winklebleck_Line_005 394.46 4.54 12.75 Open Winklebleck_Line_006 112.87 2.81 8.25 Open Winklebleck_Line_007 107.17 2.91 9.24 Open Wy'east_Road_Line_000 111.14 2.66 7.29 Open Wy'east_Road_Line_001 4.85 0.12 0.02 Open Wy'east_Road_Line_002 53.86 1.29 1.91 Open
Yasui_Line_000 661.20 4.31 8.31 Open
Yasui_Line_001 552.90 3.48 5.48 Open
Yasui_Line_002 219.46 2.34 3.58 Open
Yasui_Line_003 324.90 3.46 7.41 Open Lower_Highline_Pressure_004a 422.92 4.86 14.52 Open Lower_Highline_Pressure_028b 216.02 4.98 22.76 Open Thomsen_Line_001b 861.27 3.48 6.10 Open
Kellly_Line_000b 142.78 3.29 10.59 Open
Paasch_Line_004b 802.56 3.25 3.73 Open
Eastside_Canal_024a 6884.60 4.93 2.95 Open Dethman/Swyers_Line_000b 826.79 3.34 3.94 Open Rasmussen_Line_000a 1796.36 4.44 4.99 Open Rasmussen_Line_003b 1501.68 4.32 5.18 Open Allison_Line_001b 1000.91 4.05 5.62 Open
Oanna_005a 10641.07 4.46 1.79 Open
Nunamaker_Line_001b 738.16 4.64 9.88 Open Neufeldt_Line_000b 271.89 2.90 5.32 Open
Oanna_009a 8801.12 4.57 2.17 Open
Bietler_Line_002b 271.91 2.90 5.32 Open

Link Results: (continued) --

Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --

Winklebleck_Line_001b 478.83 3.01 4.20 Open Cherry_Hill_Line_002b 147.63 3.68 13.57 Open Sheirbon_Hill_Line_002b 609.62 3.83 6.57 Open Panorama_Point_Line_000 28.50 0.66 0.53 Open Whiskey_Creek_Pipeline_024 1444.35 4.49 5.84 Open Lariza_Line_000c 385.89 4.11 10.19 Open
Lariza_Line_000b 414.39 4.42 11.60 Open Sheppard_Line_000a 110.59 3.00 12.21 Open
Tiffany_Line_000b 11.68 0.27 0.06 Open
Tallman_Line_000b 1.71 0.04 0.00 Open Dethman_Ridge_Line_001b 8301.80 4.50 2.22 Open
Oanna_011b 368.21 3.93 9.39 Open
Thomsen_Line_001c 861.27 3.48 4.21 Open
Paasch_Line_004a 802.56 3.25 3.73 Open
Paasch_Line_004c 802.56 3.25 3.72 Open
Crag_Rat_Line_002c 725.59 4.93 10.99 Open Neal_Mill_Line_002b 658.66 4.14 7.57 Open Dethman_Ridge_Line_061b 1739.36 5.00 6.84 Open Bietler_line_002c 271.91 2.90 5.37 Open Cherry_Hill_Line_002c 147.63 3.68 13.55 Open Whiskey_Creek_Pipeline_006b 2112.83 4.53

4.76 Open Whiskey_Creek_Pipeline_10b 478.79 3.01 4.20 Open Central_Lateral_Pipeline_001b 39874.56 3.14 0.35 Open Central_Lateral_Pipeline_001c 39346.72 3.10 0.34 Open Whiskey_Creek_Pipeline_10c 390.44 4.16 10.41 Open Main_Canal_Combine_000a 29000.00 4.52 1.03 Open Main_Canal_Combine_000b 29000.00 4.52 1.03 Open Main_Canal_035 21709.79 4.34 1.11 Open
V_LHP_2 216.02 2.45 262.50 Active Valve
V_LL_1 2767.64 4.42 246.81 Active Valve
V_SR_WB 18851.72 8.56 284.44 Active Valve
V_EA_WB 18754.25 8.51 145.05 Active Valve
V_CHL_2 3634.63 4.58 334.77 Active Valve
V_CHL_1 882.93 3.61 103.66 Active Valve
V_MC_WB 50709.79 4.76 57.66 Active Valve
V_CP_WB_2 836.20 2.37 0.00 Open Valve
V_DVP_1 10294.30 4.67 267.08 Active Valve V_MCL_1 2239.27 1.89 199.32 Active Valve
V_GL_1 360.23 4.09 79.71 Active Valve
V_KL 142.78 3.65 249.97 Active Valve
V_DSL 826.79 3.38 254.46 Active Valve
V_RRL 1501.68 4.26 213.23 Active Valve
V_O_2 11403.75 5.94 179.08 Active Valve
V_O_3 8801.12 3.99 243.71 Active Valve
V_NFL 271.89 3.09 197.05 Active Valve
V_NML 738.16 4.71 321.16 Active Valve
V_AL 1000.91 4.09 82.69 Active Valve

Link Results: (continued) ---
Link Flow VelocityUnit Headloss Status
ID GPM fps ft/Kft --
V_WL 478.83 5.43 195.50 Active Valve
V_SHH 609.62 3.89 225.05 Active Valve
V_O_1 368.21 4.18 129.75 Active Valve
V_LRL 414.39 4.70 226.94 Active Valve
V_TFL 11.68 0.30 175.47 Active Valve
V_TLL 1.71 0.04 216.87 Active Valve
V_DRL 8301.80 5.89 182.53 Active Valve
V_SHP 110.59 2.82 220.19 Active Valve
V_WCP 127.13 3.25 49.28 Active Valve
V_LHP 388.72 4.41 63.27 Active Valve
V_HUL 203.49 2.31 107.30 Active Valve
V_TL 861.27 3.52 265.63 Active Valve
V_PL2 972.12 3.97 191.27 Active Valve
V_CR2 293.53 3.33 253.97 Active Valve V_CR3 178.97 4.57 133.78 Active Valve
V_ML 67.26 1.72 81.66 Active Valve
V_NML2 435.49 4.94 144.58 Active Valve
V_NEML 658.66 4.20 122.58 Active Valve
V_DRL2 245.38 2.78 120.72 Active Valve
V_DRL3 1739.36 4.93 46.63 Active Valve
V_BL2 324.93 3.69 71.02 Active Valve
V_GL3 7.99 0.20 198.00 Active Valve
V_WLB3 527.84 3.37 71.91 Active Valve
V_WBL4 107.17 2.74 179.65 Active Valve
V_CH3 506.16 3.23 58.83 Active Valve
V_BUL3 120.83 3.08 170.93 Active Valve
V_MBH1 145.34 0.41 218.27 Active Valve
V_DV3 7883.23 12.58 159.29 Active Valve
V_CRLO 277.59 3.15 78.25 Active Valve V_POL 302.39 3.43 227.03 Active Valve
V_RA 502.20 3.21 112.51 Active Valve
V_ACH 2098.82 3.35 179.88 Active Valve
V_FS 156.19 3.99 42.04 Active Valve
V_CHL3 147.63 3.77 153.54 Active Valve
V_SHP2 388.74 4.41 175.37 Active Valve
V_CLP 19355.60 8.79 0.00 Open Valve
V_CLP2 503.89 3.22 211.08 Active Valve
V_WCP2 658.93 1.37 138.49 Active Valve
V_WCP3 51.30 1.31 168.15 Active Valve
V_LHP2 658.33 4.20 20.48 Active Valve
V_WCP4 1252.83 3.55 0.00 Open Valve

V_MC 29000.00 5.14 3.29 Active Valve

Appendix E
Detailed Cost Estimates

TABLE E-1. CAPITAL COSTS FOR THE EAST FORK IRRIGATION DISTRICT EASTSIDE SERVICE AREA DELIVERY SYSTEM.

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Eastside Canal	Pipe	18	21	302	feet	$19,205	$1,921	$2,689	$7,144	$30,959
Eastside Canal	Pipe	20	21	130	feet	$8,294	$829	$1,161	$3,085	$13,369
Eastside Canal	Pipe	20	26	452	feet	$23,438	$2,344	$3,281	$8,719	$37,782
Eastside Canal	Pipe	24	21	2,456	feet	$156,151	$15,615	$21,861	$58,088	$251,716
Eastside Canal	Pipe	26	21	784	feet	$49,846	$4,985	$6,978	$18,543	$80,352
Eastside Canal	Pipe	26	26	396	feet	$34,748	$3,475	$4,865	$12,926	$56,014
Eastside Canal	Pipe	28	26	3,274	feet	$333,104	$33,310	$46,635	$123,915	$536,964
Eastside Canal	Pipe	36	26	3,376	feet	$567,827	$56,783	$79,496	$211,232	$915,338
Eastside Canal	Pipe	42	26	20,922	feet	$4,787,066	$478,707	$670,189	$1,780,789	$7,716,751
Eastside Canal	Turnout	N/A	N/A	39	each	$312,000	$31,200	$43,680	$116,064	$502,944
Crag Rate Pipeline	Pipe	4	17	1,816	feet	$7,151	$715	$1,001	$2,660	$11,527
Crag Rate Pipeline	Pipe	4	21	1,823	feet	$115,909	$11,591	$16,227	$43,118	$186,845
Crag Rate Pipeline	Pipe	4	26	1,275	feet	$3,336	$334	$467	$1,241	$5,378
Crag Rate Pipeline	Pipe	4	32.5	54	feet	$113	$11	$16	$42	$183
Crag Rate Pipeline	Pipe	6	11	2,092	feet	$26,518	$2,652	$3,712	$9,865	$42,746
Crag Rate Pipeline	Pipe	6	26	1,248	feet	$7,098	$710	$994	$2,641	$11,442
Crag Rate Pipeline	Pipe	8	21	1,531	feet	$97,314	$9,731	$13,624	$36,201	$156,869
Crag Rate Pipeline	Pipe	10	26	7	feet	$106	$11	$15	$40	$171
Crag Rate Pipeline	Turnout	N/A	N/A	10	each	$80,000	$8,000	$11,200	$29,760	$128,960
Crag Rate Pipeline	PRV Station	4	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Crag Rate Pipeline	PRV Station	6	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dethman/Swyers Line	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Whiskey Creek Pipeline	Pipe	4	13.5	297	feet	$1,441	$144	$202	$536	$2,323
Whiskey Creek Pipeline	Pipe	4	21	1,400	feet	$88,985	$8,899	$12,458	$33,102	$143,444
Whiskey Creek Pipeline	Pipe	4	26	703	feet	$1,838	$184	$257	$684	$2,964

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Whiskey Creek Pipeline	Pipe	4	32.5	1,287	feet	$2,713	$271	$380	$1,009	$4,374
Whiskey Creek Pipeline	Pipe	5.375	19	923	feet	$4,664	$466	$653	$1,735	$7,518
Whiskey Creek Pipeline	Pipe	6	11	1,144	feet	$14,506	$1,451	$2,031	$5,396	$23,384
Whiskey Creek Pipeline	Pipe	6	32.5	1,538	feet	$7,072	$707	$990	$2,631	$11,400
Whiskey Creek Pipeline	Pipe	8	21	3,359	feet	$213,530	$21,353	$29,894	$79,433	$344,210
Whiskey Creek Pipeline	Pipe	8	26	1,469	feet	$14,174	$1,417	$1,984	$5,273	$22,849
Whiskey Creek Pipeline	Pipe	8	32.5	2,025	feet	$15,742	$1,574	$2,204	$5,856	$25,376
Whiskey Creek Pipeline	Pipe	10	26	765	feet	$11,459	$1,146	$1,604	$4,263	$18,471
Whiskey Creek Pipeline	Pipe	10	32.5	77	feet	$927	$93	$130	$345	$1,495
Whiskey Creek Pipeline	Pipe	12	13.5	771	feet	$30,087	$3,009	$4,212	$11,192	$48,500
Whiskey Creek Pipeline	Pipe	12	19	534	feet	$15,174	$1,517	$2,124	$5,645	$24,461
Whiskey Creek Pipeline	Pipe	12	21	1,384	feet	$87,964	$8,796	$12,315	$32,723	$141,798
Whiskey Creek Pipeline	Pipe	14	21	388	feet	$24,640	$2,464	$3,450	$9,166	$39,720
Whiskey Creek Pipeline	Pipe	16	15.5	4,202	feet	$227,353	$22,735	$31,829	$84,575	$366,493
Whiskey Creek Pipeline	Pipe	16	21	2,120	feet	$134,764	$13,476	$18,867	$50,132	$217,240
Whiskey Creek Pipeline	Pipe	20	13.5	286	feet	$27,420	$2,742	$3,839	$10,200	$44,200
Whiskey Creek Pipeline	Turnout	N/A	N/A	23	each	$184,000	$18,400	$25,760	$68,448	$296,608
Whiskey Creek Pipeline	PRV Station	4	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Whiskey Creek Pipeline	PRV Station	6	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Whiskey Creek Pipeline	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Whiskey Creek Pipeline	PRV Station	14	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Kelly Pipeline	Pipe	4	26	1,476	feet	$3,862	$386	$541	$1,437	$6,225
Kelly Pipeline	Pipe	4	32.5	1	feet	$3	$0	$0	$1	$4
Kelly Pipeline	Pipe	5.375	11	1,530	feet	$12,784	$1,278	$1,790	$4,756	$20,608
Kelly Pipeline	Turnout	N/A	N/A	1	each	$8,000	$800	$1,120	$2,976	$12,896
Kelly Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Loop Pipeline	Pipe	4	21	996	feet	$63,334	$6,333	$8,867	$23,560	$102,094
Loop Pipeline	Pipe	4	26	3,081	feet	$8,061	$806	$1,128	$2,999	$12,994
Loop Pipeline	Pipe	4	32.5	454	feet	$957	$96	$134	$356	$1,542
Loop Pipeline	Pipe	6	26	1,867	feet	$10,622	$1,062	$1,487	$3,951	$17,122
Loop Pipeline	Pipe	8	32.5	636	feet	$4,941	$494	$692	$1,838	$7,966
Loop Pipeline	Pipe	10	21	1,712	feet	$108,830	$10,883	$15,236	$40,485	$175,434
Loop Pipeline	Pipe	10	26	655	feet	$9,820	$982	$1,375	$3,653	$15,829
Loop Pipeline	Pipe	12	21	1,815	feet	$115,400	$11,540	$16,156	$42,929	$186,025
Loop Pipeline	Pipe	16	21	1,209	feet	$76,832	$7,683	$10,757	$28,582	$123,854
Loop Pipeline	Pipe	16	26	155	feet	$5,155	$516	$722	$1,918	$8,310
Loop Pipeline	Pipe	18	13.5	765	feet	$59,440	$5,944	$8,322	$22,112	$95,818
Loop Pipeline	Pipe	18	26	2,791	feet	$117,274	$11,727	$16,418	$43,626	$189,045
Loop Pipeline	Pipe	18	32.5	16	feet	$546	$55	$76	$203	$880
Loop Pipeline	Pipe	20	21	75	feet	$4,765	$477	$667	$1,773	$7,681
Loop Pipeline	Pipe	24	21	1,903	feet	$120,980	$12,098	$16,937	$45,004	$195,019
Loop Pipeline	Turnout	N/A	N/A	24	each	$192,000	$19,200	$26,880	$71,424	$309,504
Loop Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Loop Pipeline	PRV Station	16	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Lower Highline Pressure Pipeline	Pipe	4	15.5	0	feet	$0	$0	$0	$0	$0
Lower Highline Pressure Pipeline	Pipe	4	17	1,039	feet	$4,090	$409	$573	$1,522	$6,594
Lower Highline Pressure Pipeline	Pipe	4	21	2,334	feet	$148,361	$14,836	$20,771	$55,190	$239,159
Lower Highline Pressure Pipeline	Pipe	4	26	1,861	feet	$4,869	$487	$682	$1,811	$7,849
Lower Highline Pressure Pipeline	Pipe	4	32.5	2,105	feet	$4,438	$444	$621	$1,651	$7,154
Lower Highline Pressure Pipeline	Pipe	5.375	15.5	440	feet	$2,682	$268	$376	$998	$4,324
Lower Highline Pressure Pipeline	Pipe	6	21	33	feet	$2,068	$207	$290	$769	$3,334

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Lower Highline Pressure Pipeline	Pipe	6	26	2,291	feet	$13,037	$1,304	$1,825	$4,850	$21,015
Lower Highline Pressure Pipeline	Pipe	6	32.5	2	feet	$8	$1	$1	$3	$13
Lower Highline Pressure Pipeline	Pipe	8	32.5	102	feet	$794	$79	$111	$295	$1,279
Lower Highline Pressure Pipeline	Turnout	N/A	N/A	17	each	$136,000	$13,600	$19,040	$50,592	$219,232
Lower Highline Pressure Pipeline	PRV Station	4	N/A	3	each	$225,000	$22,500	$31,500	$83,700	$362,700
Lower Highline Pressure Pipeline	PRV Station	6	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Lower Highline Pressure Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Paasch Pipeline	Pipe	6	21	5	feet	$330	$33	$46	$123	$532
Paasch Pipeline	Pipe	8	21	1,345	feet	$85,534	$8,553	$11,975	$31,819	$137,881
Paasch Pipeline	Pipe	10	13.5	1,078	feet	$29,906	$2,991	$4,187	$11,125	$48,209
Paasch Pipeline	Pipe	10	21	1,109	feet	$70,536	$7,054	$9,875	$26,239	$113,704
Paasch Pipeline	Pipe	10	32.5	587	feet	$7,113	$711	$996	$2,646	$11,467
Paasch Pipeline	Turnout	N/A	N/A	4	each	$32,000	$3,200	$4,480	$11,904	$51,584
Paasch Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Rasmussen Pipeline	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Tallman Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Thomsen Pipeline	Pipe	4	21	1,183	feet	$75,193	$7,519	$10,527	$27,972	$121,212
Thomsen Pipeline	Pipe	4	32.5	0	feet	$1	$0	$0	$0	$1
Thomsen Pipeline	Pipe	5.375	21	2,963	feet	$188,395	$18,840	$26,375	$70,083	$303,693
Thomsen Pipeline	Pipe	8	32.5	3	feet	$21	$2	$3	$8	$34
Thomsen Pipeline	Pipe	10	13.5	1,196	feet	$33,187	$3,319	$4,646	$12,345	$53,497
Thomsen Pipeline	Pipe	10	32.5	685	feet	$8,301	$830	$1,162	$3,088	$13,381
Thomsen Pipeline	Turnout	N/A	N/A	4	each	$32,000	$3,200	$4,480	$11,904	$51,584
Thomsen Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
					Total:	**$11,265,148**	**$1,126,515**	**$1,577,121**	**$4,190,635**	**$18,159,419**

Notes:

- Line item costs may not add up to the total costs due to rounding errors.

TABLE E-2. ALTERNATIVE A CAPITAL COSTS FOR THE EAST FORK IRRIGATION DISTRICT MAIN CANAL SERVICE AREA DELIVERY SYSTEM.

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Main Canal	Pipe	54	26	4,074	feet	$1,541,366	$154,137	$215,791	$573,388	$2,484,683
Main Canal	Pipe	54	41	47,470	feet	$11,565,373	$1,156,537	$1,619,152	$4,302,319	$18,643,381
Main Canal	Pipe	48	26	872	feet	$260,794	$26,079	$36,511	$97,015	$420,399
Main Canal	Pipe	48	41	18,820	feet	$3,622,999	$362,300	$507,220	$1,347,756	$5,840,275
Main Canal	Pipe	66	N/A	38	feet	$20,945	$2,094	$2,932	$7,791	$33,763
Main Canal	Turnout	N/A	N/A	49	each	$392,000	$39,200	$54,880	$145,824	$631,904
Main Canal	PRV Station	66	N/A	1	each	$280,000	$28,000	$39,200	$104,160	$451,360
Arens Lateral Pipeline	Pipe	4	32.5	0	feet	$0	$0	$0	$0	$0
Arens Lateral Pipeline	Pipe	6	32.5	1,334	feet	$6,135	$613	$859	$2,282	$9,889
Arens Lateral Pipeline	Turnout	N/A	N/A	2	each	$16,000	$1,600	$2,240	$5,952	$25,792
Bowcut Pipeline	Pipe	4	26	1	feet	$2	$0	$0	$1	$4
Bowcut Pipeline	Pipe	4	32.5	337	feet	$711	$71	$99	$264	$1,146
Bowcut Pipeline	Pipe	6	26	1,553	feet	$8,834	$883	$1,237	$3,286	$14,240
Bowcut Pipeline	Pipe	6	32.5	4,524	feet	$20,800	$2,080	$2,912	$7,737	$33,529
Bowcut Pipeline	Turnout	N/A	N/A	16	each	$128,000	$12,800	$17,920	$47,616	$206,336
Christopher Pipeline	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Fisher Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
					Total:	**$18,013,958**	**$1,801,396**	**$2,521,954**	**$6,701,192**	**$29,038,500**

Notes:

- Line item costs may not add up to the total costs due to rounding errors.

TABLE E-3. ALTERNATIVE B CAPITAL COSTS FOR THE EAST FORK IRRIGATION DISTRICT MAIN CANAL SERVICE AREA DELIVERY SYSTEM.

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Main Canal	Pipe	66	Steel	38	feet	$20,945	$2,094	$2,932	$7,791	$33,763
Main Canal	Pipe	54	26	4,074	feet	$1,541,366	$154,137	$215,791	$573,388	$2,484,683
Main Canal	Pipe	54	41	36,434	feet	$8,876,697	$887,670	$1,242,738	$3,302,131	$14,309,236
Main Canal	Pipe	48	26	1,257	feet	$375,658	$37,566	$52,592	$139,745	$605,560
Main Canal	Pipe	48	41	24,809	feet	$4,775,854	$477,585	$668,620	$1,776,618	$7,698,676
Main Canal	Turnout	N/A	N/A	49	each	$392,000	$39,200	$54,880	$145,824	$631,904
Main Canal	PRV Station	66	N/A	1	each	$280,000	$28,000	$39,200	$104,160	$451,360
Christopher Pipeline	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Fisher Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Arens Lateral Pipeline	Pipe	6	32.5	1,334	feet	$6,135	$613	$859	$2,282	$9,889
Arens Lateral Pipeline	Turnout	N/A	N/A	2	each	$16,000	$1,600	$2,240	$5,952	$25,792
Bowcut Pipeline	Pipe	4	32.5	337	feet	$711	$71	$99	$264	$1,146
Bowcut Pipeline	Pipe	6	26	1,553	feet	$8,834	$883	$1,237	$3,286	$14,240
Bowcut Pipeline	Pipe	6	32.5	4,524	feet	$20,800	$2,080	$2,912	$7,737	$33,529
Bowcut Pipeline	Turnout	N/A	N/A	16	each	$128,000	$12,800	$17,920	$47,616	$206,336
					Total:	**$16,593,001**	**$1,659,300**	**$2,323,020**	**$6,172,596**	**$26,747,917**

Notes:

- Line item costs may not add up to the total costs due to rounding errors.

TABLE E-4. CAPITAL COSTS FOR THE EAST FORK IRRIGATION DISTRICT CENTRAL SERVICE AREA DELIVERY SYSTEM.

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Central Lateral Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Central Lateral Pipeline	PRV Station	30	N/A	3	each	$420,000	$42,000	$58,800	$156,240	$677,040
Allison Pipeline	Pipe	4	26	127	feet	$331	$33	$46	$123	$534
Allison Pipeline	Pipe	6	26	1,575	feet	$8,962	$896	$1,255	$3,334	$14,446
Allison Pipeline	Pipe	6	32.5	5	feet	$23	$2	$3	$9	$37
Allison Pipeline	Pipe	8	32.5	340	feet	$2,641	$264	$370	$983	$4,258
Allison Pipeline	Pipe	10	21	2,460	feet	$156,369	$15,637	$21,892	$58,169	$252,068
Allison Pipeline	Pipe	10	32.5	465	feet	$5,637	$564	$789	$2,097	$9,086
Allison Pipeline	Turnout	N/A	N/A	8	each	$64,000	$6,400	$8,960	$23,808	$103,168
Allison Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dethman Ridge Line	Pipe	4	21	5,242	feet	$333,270	$33,327	$46,658	$123,977	$537,232
Dethman Ridge Line	Pipe	4	26	3,756	feet	$9,827	$983	$1,376	$3,656	$15,841
Dethman Ridge Line	Pipe	4	32.5	2,065	feet	$4,352	$435	$609	$1,619	$7,016
Dethman Ridge Line	Pipe	5.375	26	261	feet	$980	$98	$137	$365	$1,580
Dethman Ridge Line	Pipe	6	19	1,659	feet	$12,725	$1,273	$1,782	$4,734	$20,513
Dethman Ridge Line	Pipe	6	21	5,038	feet	$320,324	$32,032	$44,845	$119,160	$516,362
Dethman Ridge Line	Pipe	6	26	1,571	feet	$8,941	$894	$1,252	$3,326	$14,413
Dethman Ridge Line	Pipe	6	32.5	3,815	feet	$17,540	$1,754	$2,456	$6,525	$28,275
Dethman Ridge Line	Pipe	8	19	2,966	feet	$38,578	$3,858	$5,401	$14,351	$62,188
Dethman Ridge Line	Pipe	8	21	1,527	feet	$97,049	$9,705	$13,587	$36,102	$156,443
Dethman Ridge Line	Pipe	8	26	148	feet	$1,432	$143	$201	$533	$2,309
Dethman Ridge Line	Pipe	8	32.5	548	feet	$4,259	$426	$596	$1,584	$6,866
Dethman Ridge Line	Pipe	10	21	723	feet	$45,989	$4,599	$6,438	$17,108	$74,134
Dethman Ridge Line	Pipe	10	26	70	feet	$1,045	$104	$146	$389	$1,684
Dethman Ridge Line	Pipe	10	32.5	2,701	feet	$32,724	$3,272	$4,581	$12,173	$52,751
Dethman Ridge Line	Pipe	12	26	1,227	feet	$25,868	$2,587	$3,621	$9,623	$41,699

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Dethman Ridge Line	Pipe	12	32.5	70	feet	$1,194	$119	$167	$444	$1,925
Dethman Ridge Line	Pipe	14	26	525	feet	$13,342	$1,334	$1,868	$4,963	$21,507
Dethman Ridge Line	Pipe	14	32.5	2,064	feet	$42,353	$4,235	$5,929	$15,755	$68,273
Dethman Ridge Line	Pipe	16	26	643	feet	$21,341	$2,134	$2,988	$7,939	$34,401
Dethman Ridge Line	Pipe	16	32.5	4	feet	$102	$10	$14	$38	$164
Dethman Ridge Line	Pipe	24	26	1,014	feet	$75,742	$7,574	$10,604	$28,176	$122,097
Dethman Ridge Line	Pipe	24	32.5	2,687	feet	$161,863	$16,186	$22,661	$60,213	$260,924
Dethman Ridge Line	Pipe	26	32.5	230	feet	$16,260	$1,626	$2,276	$6,049	$26,210
Dethman Ridge Line	Pipe	28	32.5	923	feet	$75,798	$7,580	$10,612	$28,197	$122,187
Dethman Ridge Line	Pipe	30	21	2,984	feet	$189,685	$18,968	$26,556	$70,563	$305,772
Dethman Ridge Line	Pipe	30	32.5	337	feet	$31,768	$3,177	$4,448	$11,818	$51,210
Dethman Ridge Line	Pipe	34	11	0	feet	$37	$4	$5	$14	$59
Dethman Ridge Line	Turnout	N/A	N/A	74	each	$592,000	$59,200	$82,880	$220,224	$954,304
Dethman Ridge Line	PRV Station	6	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dethman Ridge Line	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dethman Ridge Line	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dethman Ridge Line	PRV Station	24	N/A	1	each	$100,000	$10,000	$14,000	$37,200	$161,200
Oanna Pipeline	Pipe	4	19	541	feet	$1,910	$191	$267	$711	$3,080
Oanna Pipeline	Pipe	4	21	2,643	feet	$168,000	$16,800	$23,520	$62,496	$270,816
Oanna Pipeline	Pipe	4	32.5	490	feet	$1,033	$103	$145	$384	$1,666
Oanna Pipeline	Pipe	5.375	21	537	feet	$34,149	$3,415	$4,781	$12,704	$55,049
Oanna Pipeline	Pipe	6	17	1,719	feet	$14,630	$1,463	$2,048	$5,442	$23,584
Oanna Pipeline	Pipe	6	21	2,646	feet	$168,212	$16,821	$23,550	$62,575	$271,157
Oanna Pipeline	Pipe	6	26	1,932	feet	$10,992	$1,099	$1,539	$4,089	$17,719
Oanna Pipeline	Pipe	6	32.5	626	feet	$2,878	$288	$403	$1,071	$4,640
Oanna Pipeline	Pipe	8	19	288	feet	$3,749	$375	$525	$1,395	$6,043
Oanna Pipeline	Pipe	8	21	382	feet	$24,275	$2,428	$3,399	$9,030	$39,132

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Oanna Pipeline	Pipe	8	26	4,323	feet	$41,729	$4,173	$5,842	$15,523	$67,267
Oanna Pipeline	Pipe	8	32.5	1,006	feet	$7,822	$782	$1,095	$2,910	$12,610
Oanna Pipeline	Pipe	10	11	1,384	feet	$46,201	$4,620	$6,468	$17,187	$74,476
Oanna Pipeline	Pipe	10	26	5	feet	$68	$7	$9	$25	$109
Oanna Pipeline	Pipe	30	32.5	2	feet	$175	$18	$25	$65	$282
Oanna Pipeline	Pipe	32	13.5	2,661	feet	$653,911	$65,391	$91,548	$243,255	$1,054,105
Oanna Pipeline	Pipe	32	21	1,139	feet	$72,403	$7,240	$10,136	$26,934	$116,714
Oanna Pipeline	Pipe	32	32.5	3,310	feet	$354,907	$35,491	$49,687	$132,025	$572,110
Oanna Pipeline	Pipe	34	26	1,967	feet	$295,028	$29,503	$41,304	$109,750	$475,585
Oanna Pipeline	Pipe	34	32.5	0	feet	$1	$0	$0	$0	$2
Oanna Pipeline	Pipe	36	21	1,008	feet	$64,086	$6,409	$8,972	$23,840	$103,307
Oanna Pipeline	Turnout	N/A	N/A	28	each	$224,000	$22,400	$31,360	$83,328	$361,088
Oanna Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Oanna Pipeline	PRV Station	6	N/A	3	each	$225,000	$22,500	$31,500	$83,700	$362,700
Oanna Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Oanna Pipeline	PRV Station	30	N/A	1	each	$140,000	$14,000	$19,600	$52,080	$225,680
Oanna Pipeline	PRV Station	32	N/A	1	each	$140,000	$14,000	$19,600	$52,080	$225,680
Chipping Pipeline	Pipe	4	17	653	feet	$2,572	$257	$360	$957	$4,145
Chipping Pipeline	Pipe	4	21	1,820	feet	$115,721	$11,572	$16,201	$43,048	$186,543
Chipping Pipeline	Pipe	4	26	521	feet	$1,363	$136	$191	$507	$2,197
Chipping Pipeline	Pipe	4	32.5	1,009	feet	$2,128	$213	$298	$792	$3,431
Chipping Pipeline	Pipe	5.375	13.5	1,111	feet	$7,707	$771	$1,079	$2,867	$12,423
Chipping Pipeline	Pipe	6	21	902	feet	$57,365	$5,736	$8,031	$21,340	$92,472
Chipping Pipeline	Pipe	6	26	472	feet	$2,684	$268	$376	$999	$4,327
Chipping Pipeline	Pipe	6	32.5	2,422	feet	$11,133	$1,113	$1,559	$4,141	$17,946
Chipping Pipeline	Pipe	8	32.5	1,052	feet	$8,176	$818	$1,145	$3,042	$13,180
Chipping Pipeline	Pipe	10	19	339	feet	$6,852	$685	$959	$2,549	$11,046

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Chipping Pipeline	Pipe	10	32.5	333	feet	$4,033	$403	$565	$1,500	$6,501
Chipping Pipeline	Pipe	12	21	1,542	feet	$98,048	$9,805	$13,727	$36,474	$158,053
Chipping Pipeline	Pipe	14	21	1,366	feet	$86,862	$8,686	$12,161	$32,313	$140,022
Chipping Pipeline	Pipe	14	26	1,376	feet	$34,947	$3,495	$4,893	$13,000	$56,334
Chipping Pipeline	Pipe	18	26	1,156	feet	$48,585	$4,858	$6,802	$18,074	$78,319
Chipping Pipeline	Pipe	18	32.5	324	feet	$10,997	$1,100	$1,540	$4,091	$17,728
Chipping Pipeline	Pipe	20	26	596	feet	$30,904	$3,090	$4,327	$11,496	$49,817
Chipping Pipeline	Pipe	24	11	1,936	feet	$322,239	$32,224	$45,113	$119,873	$519,449
Chipping Pipeline	Pipe	24	15.5	1,148	feet	$139,707	$13,971	$19,559	$51,971	$225,207
Chipping Pipeline	Turnout	N/A	N/A	20	each	$160,000	$16,000	$22,400	$59,520	$257,920
Chipping Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Chipping Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Chipping Pipeline	PRV Station	12	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Chipping Pipeline	PRV Station	18	N/A	1	each	$100,000	$10,000	$14,000	$37,200	$161,200
Gilkerson Pipeline	Pipe	4	11	1,307	feet	$7,633	$763	$1,069	$2,839	$12,304
Gilkerson Pipeline	Pipe	4	21	753	feet	$47,877	$4,788	$6,703	$17,810	$77,177
Gilkerson Pipeline	Pipe	6	21	2,089	feet	$132,821	$13,282	$18,595	$49,410	$214,108
Gilkerson Pipeline	Pipe	6	32.5	5	feet	$25	$2	$3	$9	$40
Gilkerson Pipeline	Turnout	N/A	N/A	5	each	$40,000	$4,000	$5,600	$14,880	$64,480
Gilkerson Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Winklebleck Pipeline	Pipe	4	21	943	feet	$59,965	$5,997	$8,395	$22,307	$96,664
Winklebleck Pipeline	Pipe	4	32.5	246	feet	$518	$52	$72	$193	$834
Winklebleck Pipeline	Pipe	6	19	324	feet	$2,485	$248	$348	$924	$4,006
Winklebleck Pipeline	Pipe	6	26	473	feet	$2,690	$269	$377	$1,001	$4,337
Winklebleck Pipeline	Pipe	6	32.5	5	feet	$24	$2	$3	$9	$38
Winklebleck Pipeline	Pipe	8	13.5	1,380	feet	$24,646	$2,465	$3,450	$9,168	$39,730
Winklebleck Pipeline	Pipe	8	26	1,007	feet	$9,722	$972	$1,361	$3,617	$15,672

Pipeline Name	***Item***	***Nominal Diameter***	***Pressure Rating***	***Quantity***	***Units***	***Construction Costs***	***Engineering, Construction Management, Survey***	***General Management, General Contractor***	***Contingency Costs***	***Total Costs***
Winklebleck Pipeline	Pipe	8	32.5	594	feet	$4,617	$462	$646	$1,717	$7,442
Winklebleck Pipeline	Turnout	N/A	N/A	5	each	$40,000	$4,000	$5,600	$14,880	$64,480
Winklebleck Pipeline	PRV Station	6	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Winklebleck Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
					Total:	**$8,304,559**	**$830,456**	**$1,162,638**	**$3,089,296**	**$13,386,949**

Notes:

- Line item costs may not add up to the total costs due to rounding errors.

TABLE E-5. CAPITAL COSTS FOR THE EAST FORK IRRIGATION DISTRICT DUKES VALLEY SERVICE AREA DELIVERY SYSTEM.

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Dukes Valley Canal	Pipe	30	21	2,480	feet	$157,651	$15,765	$22,071	$58,646	$254,134
Dukes Valley Canal	Pipe	32	21	13,166	feet	$837,030	$83,703	$117,184	$311,375	$1,349,293
Dukes Valley Canal	Pipe	32	26	1,327	feet	$176,368	$17,637	$24,692	$65,609	$284,306
Dukes Valley Canal	Pipe	32	32.5	1,499	feet	$160,740	$16,074	$22,504	$59,795	$259,113
Dukes Valley Canal	Pipe	34	17	1,637	feet	$367,025	$36,702	$51,383	$136,533	$591,644
Dukes Valley Canal	Pipe	34	21	6,430	feet	$408,813	$40,881	$57,234	$152,079	$659,007
Dukes Valley Canal	Turnout	N/A	N/A	22	each	$176,000	$17,600	$24,640	$65,472	$283,712
Dukes Valley Canal	PRV Station	16	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dukes Valley Canal	PRV Station	30	N/A	1	each	$140,000	$14,000	$19,600	$52,080	$225,680
Cameron Hill Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Cameron Hill Pipeline	PRV Station	6	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Cameron Hill Pipeline	PRV Station	10	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Marsh/Chamberlin Pipeline	Pipe	4	21	5,367	feet	$341,199	$34,120	$47,768	$126,926	$550,013
Marsh/Chamberlin Pipeline	Pipe	4	26	6,178	feet	$16,164	$1,616	$2,263	$6,013	$26,057
Marsh/Chamberlin Pipeline	Pipe	4	32.5	2,085	feet	$4,396	$440	$615	$1,635	$7,087
Marsh/Chamberlin Pipeline	Pipe	5.375	32.5	27	feet	$81	$8	$11	$30	$130
Marsh/Chamberlin Pipeline	Pipe	6	17	688	feet	$5,851	$585	$819	$2,177	$9,433
Marsh/Chamberlin Pipeline	Pipe	6	21	5	feet	$342	$34	$48	$127	$551
Marsh/Chamberlin Pipeline	Pipe	6	26	2,807	feet	$15,972	$1,597	$2,236	$5,942	$25,747
Marsh/Chamberlin Pipeline	Pipe	6	32.5	1,853	feet	$8,518	$852	$1,193	$3,169	$13,732
Marsh/Chamberlin Pipeline	Pipe	8	26	1,516	feet	$14,628	$1,463	$2,048	$5,442	$23,580
Marsh/Chamberlin Pipeline	Pipe	8	32.5	2,583	feet	$20,075	$2,007	$2,810	$7,468	$32,360
Marsh/Chamberlin Pipeline	Pipe	10	21	1,962	feet	$124,747	$12,475	$17,465	$46,406	$201,092
Marsh/Chamberlin Pipeline	Pipe	10	32.5	58	feet	$706	$71	$99	$262	$1,137

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Marsh/Chamberlin Pipeline	Pipe	12	26	628	feet	$13,233	$1,323	$1,853	$4,923	$21,331
Marsh/Chamberlin Pipeline	Pipe	12	32.5	626	feet	$10,645	$1,065	$1,490	$3,960	$17,160
Marsh/Chamberlin Pipeline	Pipe	14	32.5	39	feet	$790	$79	$111	$294	$1,274
Marsh/Chamberlin Pipeline	Pipe	16	21	894	feet	$56,866	$5,687	$7,961	$21,154	$91,669
Marsh/Chamberlin Pipeline	Pipe	16	32.5	1,300	feet	$34,816	$3,482	$4,874	$12,952	$56,124
Marsh/Chamberlin Pipeline	Pipe	18	21	2,121	feet	$134,864	$13,486	$18,881	$50,169	$217,400
Marsh/Chamberlin Pipeline	Pipe	24	21	498	feet	$31,639	$3,164	$4,430	$11,770	$51,003
Marsh/Chamberlin Pipeline	Pipe	24	26	849	feet	$63,418	$6,342	$8,878	$23,591	$102,229
Marsh/Chamberlin Pipeline	Pipe	24	32.5	392	feet	$23,646	$2,365	$3,311	$8,796	$38,118
Marsh/Chamberlin Pipeline	Pipe	26	21	1,828	feet	$116,198	$11,620	$16,268	$43,226	$187,312
Marsh/Chamberlin Pipeline	Turnout	N/A	N/A	63	each	$504,000	$50,400	$70,560	$187,488	$812,448
Marsh/Chamberlin Pipeline	PRV Station	4	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Marsh/Chamberlin Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Marsh/Chamberlin Pipeline	PRV Station	16	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Marsh/Chamberlin Pipeline	PRV Station	22	N/A	1	each	$100,000	$10,000	$14,000	$37,200	$161,200
Shute Road Pipeline	PRV Station	6	N/A	2	each	$150,000	$15,000	$21,000	$55,800	$241,800
Sheirbon Hill Pipeline	Pipe	4	26	349	feet	$913	$91	$128	$340	$1,472
Sheirbon Hill Pipeline	Pipe	6	26	1,874	feet	$10,659	$1,066	$1,492	$3,965	$17,183
Sheirbon Hill Pipeline	Pipe	8	13.5	815	feet	$14,549	$1,455	$2,037	$5,412	$23,453
Sheirbon Hill Pipeline	Pipe	8	21	5	feet	$342	$34	$48	$127	$551
Sheirbon Hill Pipeline	Pipe	8	26	856	feet	$8,267	$827	$1,157	$3,075	$13,326
Sheirbon Hill Pipeline	Pipe	8	32.5	161	feet	$1,248	$125	$175	$464	$2,012
Sheirbon Hill Pipeline	Turnout	N/A	N/A	6	each	$48,000	$4,800	$6,720	$17,856	$77,376
Sheirbon Hill Pipeline	PRV Station	8	N/A	1	each	$75,000	$7,500	$10,500	$27,900	$120,900
Dukes Valley Canal	Pipe	30	21	2,480	feet	$157,651	$15,765	$22,071	$58,646	$254,134

Pipeline Name	Item	Nominal Diameter	Pressure Rating	Quantity	Units	Construction Costs	Engineering, Construction Management, Survey	General Management, General Contractor	Contingency Costs	Total Costs
Dukes Valley Canal	Pipe	32	21	13,166	feet	$837,030	$83,703	$117,184	$311,375	$1,349,293
Dukes Valley Canal	Pipe	32	26	1,327	feet	$176,368	$17,637	$24,692	$65,609	$284,306
Dukes Valley Canal	Pipe	32	32.5	1,499	feet	$160,740	$16,074	$22,504	$59,795	$259,113
					Total:	**$4,900,401**	**$490,040**	**$686,056**	**$1,822,949**	**$7,899,446**

Notes:

- Line item costs may not add up to the total costs due to rounding errors.

Appendix F
NLine Energy Inc. Hydroelectric Energy Generation Analyses

Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Neal Creek (Location A)

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Neal Creek (Location A) Site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a "fatal flaw" summary of the site's technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the "Go", "No-Go," and "Unknown" criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Neal Creek Location A	Comments
Eligible Sites	**Go**	The proposed hydroelectric site is located about 2,000 linear ft south of 2870 Bear Ridge Drive, Hood River, OR within the Central Lateral (45°36'2.55"N, 121°30'49.32"W). The site would consist of using an existing, 1,382-ft long, 30-inch high pressure pipeline that draws from the Central Lateral Canal and discharges to Neal Creek.
Data Availability	**Go**	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP which included daily estimates of flow data through the Neal Creek Central Lateral pipeline from 2008. FCA staff confirmed on the elevation difference and the existence of any diversions

		between the pipe inlet (1,542 ft msl) and pipe outlet (1,240 ft msl). For this analysis, NLine Energy assumed that Central Lateral deliveries did not vary drastically on a yearly basis and consequently used 2008 estimated flow data as a predictor of future flows. An updated SIP with up to date flow data will be available by summer of 2017. Recent flow data would be considered during subsequent phases.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Central Lateral has a maximum diversion allotment of 80 cfs, half of which is diverted towards the Neal Creek and can be sent to proposed hydroelectric station. The data indicates the flows range from 2 to 40 cfs with net head ranging from 294 ft to 302 ft after accounting for friction losses through the 1,382 ft pipe. The site requires no residual downstream pressure.
Technology Availability	**Go**	Multiple technologies could be implemented at this site: Pelton, Crossflow, Turgo, or Francis turbine technologies fit the operating parameters of the site. For this Feasibility Assessment, only the Turgo technology was analyzed. Using daily flows from 2008 and assuming an 80 percent net efficiency, the estimated annual generation for this site was calculated as 2,900,000 kWh with a nameplate rating of approximately 760 kW. During the subsequent analysis, all technologies would be further analyzed to determine the appropriate technology and generation estimates.
Civil Implementation	**Go**	It is assumed that EFID controls the land of which a new powerhouse facility (30-ft x 40-ft) would be constructed. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from $3M - $3.9M including contingencies. The project cost range is influenced by turbine technologies, interconnection costs, environmental compliances, and other attributes of the project to be refined in subsequent analysis.
Interconnection	**Unknown**	It is assumed that 150-ft south east of the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and Installation of new three-phase distribution will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole array with ground bank and step-up transformer.
Water Rights	**Go**	Per the SIP, EFID has the consumptive water rights for this site. Documentation of hydroelectric

		generation rights as part of the existing water right will be required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.
Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Small hydroelectric projects are exempt from local permit requirements. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process process by applying to the ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**Unknown**	Multiple power monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric's transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on numerous stakeholder conversations, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from $3.3M to $4.2M with a simple payback ranging from 18 to 22 years assuming no grants or outside funding sources.
Recommendation	**Unknown**	Given the above revenue projections, project cost range, site location, and distance to nearest

		power, this project has initial moderate financial attributes, but does produce significant long-term revenue benefits. NLine Energy recommends subsequent analysis to refine environmental, interconnection and project cost estimate assumptions, as well as seek state and federal funding for the project.

Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Neal Creek (Location B)

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Neal Creek (Location B) Site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a “fatal flaw” summary of the site’s technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the “Go”, “No-Go,” and “Unknown” criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Neal Creek Location B	Comments
Eligible Sites	**Go**	The proposed hydroelectric site is located adjacent to the intersection of Bear Ridge and Sherrard Drive, Hood River, OR within the Central Lateral (45°36'22.11"N, 121°30'30.23"W). The site consists of an existing, 4,150-ft long, 30-inch high pressure pipeline that draws from the Central Lateral Canal and discharges to Neal Creek. Location B is sited on the existing piping at a lower elevation.
Data Availability	**Go**	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP which included daily estimates of flow data through the Neal Creek Central Lateral pipeline

		from 2008. FCA staff confirmed on the elevation difference and the existence of any diversions between the pipe inlet (1,542 ft msl) and pipe outlet (1,074 ft msl). For this analysis, NLine Energy assumed that Lower Central Lateral deliveries did not vary drastically on a yearly basis and consequently used 2008 estimated flow data as a predictor of future flows. An updated SIP with up to date flow data will be available by summer of 2017. Recent flow data would be considered during subsequent phases.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Central Lateral has a maximum diversion allotment of 80 cfs, half of which is diverted towards the Neal Creek and can be sent to proposed hydroelectric station. The data indicates the flows range from 2 to 40 cfs with net head ranging from 446 ft to 468 ft after accounting for friction losses through the 4,150 ft pipe. The site requires no residual downstream pressure.
Technology Availability	**Go**	Multiple technologies could be implemented at this site: Pelton, Crossflow, Turgo, or Francis turbine technologies fit the operating parameters of the site. For this Feasibility Assessment, only the Turgo technology was analyzed. Using daily flows from 2008 and assuming an 80 percent net efficiency, the estimated annual generation for this site was calculated as 4,500,000 kWh with a nameplate rating of approximately 1,150 kW. During the subsequent analysis, all technologies would be further analyzed to determine the appropriate technology and generation profile.
Civil Implementation	**Unknown**	At the time of this analysis, NLine Energy is unsure if EFID controls the land of which a new powerhouse facility (30-ft x 40-ft) would be constructed through fee simple, easement or right-of-way. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from $3.2M - $4M including contingencies. The project cost range is influenced by turbine technologies, interconnection costs, environmental compliances, and other attributes of the project to be refined in subsequent analysis.
Interconnection	**Unknown**	It is assumed that within 100 ft from the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and Installation of new three-phase distribution will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole

		array with ground bank and step-up transformer.
Water Rights	**Go**	Per the SIP, it is assumed that EFID has the consumptive water and/or hydropower rights for this site. Documentation of hydroelectric generation rights as part of the existing water right will be required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.
Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Small hydroelectric projects are exempt from local permit requirements. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process by applying to ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**Go**	Multiple monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on conversations with stakeholders, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from $7M to $8M with a simple payback

		ranging from 14 to 17 years assuming no grants or outside funding sources.
Recommendation	**Go**	Given the above revenue projections, project cost range, site location, and distance to nearest power, this project has favorable financial attributes. NLine Energy recommends subsequent analysis of this site.

NLINE ENERGY

Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Neal Creek (Location C)

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Neal Creek (Location C) Site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a "fatal flaw" summary of the site's technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the "Go", "No-Go," and "Unknown" criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Neal Creek Location C	Comments
Eligible Sites	**Go**	The proposed hydroelectric site is located near 2674 Swyers Drive, Hood River, OR adjacent to the Central Lateral Box No.4 (45°36'48.62"N, 121°30'20.13"W). The site consists of installing a new 4,300 ft pipe to an existing, 4,150-ft long, 30-inch high pressure pipeline that draws from the Central Lateral Canal and discharges to Neal Creek.
Data Availability	**Go**	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP which included daily estimates of flow data through the Neal Creek Central Lateral pipeline from 2008. FCA staff confirmed on the elevation difference and the existence of any diversions

		between the pipe inlet (1,542 ft msl) and pipe outlet (950 ft msl). For this analysis, NLine Energy assumed that Central Lateral deliveries did not vary drastically on a yearly basis and consequently used 2008 estimated flow data as a predictor of future flows. An updated SIP with up to date flow data will be available by summer of 2017. Recent flow data would be considered during subsequent phases.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Central Lateral has a maximum diversion allotment of 80 cfs, half if which is diverted towards the Neal Creek and can be sent to proposed hydroelectric station. The data indicates the flows range from 2 cfs to 40 cfs with net head ranging from 545 ft to 590 ft after accounting for friction losses through the 8,450 ft pipe. The site requires no residual downstream pressure.
Technology Availability	**Go**	Multiple technologies could be implemented at this site. Pelton, Turgo, or Francis turbine technologies fit the operating parameters of the site. For this Feasibility Study, only the Pelton technology was analyzed. Using daily flows from 2008 and assuming an 80 percent water to wire efficiency, the estimated annual generation for this site was calculated as 5,500,000 kWh with a nameplate rating of approximately 1,500 kW. During subsequent analysis, all technologies would be further analyzed to determine the appropriate technology and generation portfolio.
Civil Implementation	**Go**	It is assumed that EFID controls the land of which a new powerhouse facility (28-ft x 36-ft) would be constructed. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from \$3.4M - \$4.2M including contingencies. The new pipeline costs would be expected to range \$500,000 - \$900,000 depending on the geography and terrain yielding a total project cost range of \$3.9M to \$5.1M. The additional piping cost would be recovered through additional generation / revenue in < 10 years.
Interconnection	**Unknown**	It is assumed that within 150 ft from the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and Installation of new three-phase distribution will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole array with ground bank and step-up transformer.

Water Rights	**Go**	Per the SIP, it is assumed that EFID has the consumptive water and/or hydropower rights for this site. Documentation of hydroelectric generation rights as part of the existing water right will be required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.
Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Small hydroelectric projects are exempt from local permit requirements. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process process by applying to the ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**Go**	Multiple monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on conversations with stakeholders, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from $9M to $10M with a simple payback ranging from 13 to 16 years assuming no grants or outside funding sources.

Recommendation	**Go**	Given the above revenue projections, project cost range, site location, and distance to nearest power, this project has favorable financial attributes. NLine Energy recommends subsequent analysis of this site.

Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Odell Creek

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Odell Creek Site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a "fatal flaw" summary of the site's technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the "Go", "No-Go," and "Unknown" criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Odell Creek	Comments
Eligible Sites	**Go**	The proposed hydroelectric site is located adjacent to the Lower Dukes Valley Box near 4398 Central Vale Road, Hood River, OR (45°35'48.59"N, 121°33'53.12"W). The site consists of an existing, 3,900-ft long, 24-inch high pressure steel pipeline that draws from Cameron Hill and discharges into the Lower Dukes Valley Box.
Data Availability	**Go**	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP, which included daily estimates of flow data through the Dukes Valley Pipeline from 2008. FCA staff confirmed on the elevation difference between the pipe inlet (1,571 ft msl) and pipe outlet (1,100 ft msl). For this analysis, NLine Energy assumed that Lower Dukes Valley deliveries did not vary drastically on a yearly basis and consequently used 2008 estimated daily flow data as a

		predictor of future flows. An updated SIP with up to date flow data will be available by summer of 2017. Recent flow data would be considered during subsequent phases.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Dukes Valley lateral has a maximum diversion allotment of 23.8 cfs, of which 22 cfs can be sent to proposed hydroelectric station. The data indicates the flows range from 5 to 22 cfs with net head ranging from 450 ft to 470 ft after accounting for friction losses through the 3,900 linear ft pipe. The site requires no residual downstream pressure.
Technology Availability	**Go**	Multiple hydroelectric turbine technologies could be implemented at this site: Pelton, Turgo, or Francis turbine technologies fit the operating parameters of the site. For this Feasibility Study, only the Pelton technology was analyzed. Using daily flows from 2008 and assuming an 80 percent water to wire efficiency, the estimated annual generation for this site was calculated as 2,600,000 kWh with a turbine nameplate rating of approximately 650 kW. During subsequent analysis, all technologies would be further analyzed as well as additional years of flow data to determine the appropriate technology and further refine turbine/generator sizing.
Civil Implementation	**Go**	It is assumed that EFID controls the land of which a new powerhouse facility (30-ft x 36-ft) would be constructed. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from $2.9M - $3.8M including contingencies. The project cost range is influenced by turbine technologies, interconnection costs, environmental compliances, and other attributes of the project to be refined in subsequent analysis.
Interconnection	**Unknown**	It is assumed that 200-ft north of the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and installation of new three-phase distribution and will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole array with ground bank and step-up transformer.
Water Rights	**Go**	Per the SIP, EFID has the consumptive water rights for this site. Documentation of hydroelectric generation rights as part of the existing water right will be required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.

Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process process by applying to the ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**Unknown**	Multiple monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on conversations stakeholders, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from $2.8M to $3.7M with a simple payback ranging from 18 to 22 years assuming no grants or outside funding sources.
Recommendation	**Unknown**	Given the above revenue projections, project cost range, site location, and distance to nearest power, this project has initial moderate financial attributes, but does produce significant long-term revenue benefits. NLine Energy recommends subsequent analysis to refine environmental,

		interconnection and project cost estimate assumptions, as well as seek state and federal funding for the project.

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Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Tavern Chute

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Tavern Chute Site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a "fatal flaw" summary of the site's technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the "Go", "No-Go," and "Unknown" criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Tavern Chute	Comments
Eligible Sites	Go	The proposed hydroelectric site is located downstream of the Tavern Chute Distribution Center, 8414 OR-35, Hood River, OR along the Main Canal on the west side of Highway 35 at (45°35'15.34"N, 121°33'1.36"W). The project would consist of installing a new 250 linear foot section of pipe inside or adjacent to the Main Canal and delivering flows to a hydroelectric turbine.
Data Availability	Go	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP which included daily estimates of flow data through the Main Canal from 2008. FCA staff confirmed on the elevation difference and the existence of any diversions between the pipe inlet (1,625 ft msl) and pipe outlet (1,575 ft msl). For this analysis, NLine Energy assumed that Main Canal deliveries did not vary drastically on a yearly basis and consequently used 2008 estimated

		flow data as a predictor of future flows.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Main Canal has a maximum diversion allotment of 120 cfs, with approximately 90 cfs being diverted towards the Tavern Chute and that be sent to the proposed hydroelectric station. The data indicates the flows range from 19 to 90 cfs with a net head of approximately 50 ft.
Technology Availability	**Go**	Multiple technologies could be implemented at this site. Crossflow, Kaplan, Francis, Rickly Hydro PROPEL™ Kaplan, or Natel Energy's FreeJet™ turbine would fit the operating parameters of the site. For this Feasibility Assessment, only the Natel Free Jet technology was analyzed. Using daily flows from 2008 and assuming a 65 percent net efficiency, the estimated annual generation for this site was calculated as 850,000 kWh with a nameplate rating of approximately 285 kW. During the subsequent analysis, all technologies would be further analyzed to determine the appropriate technology and generation profiles.
Civil Implementation	**Go**	It is assumed that EFID controls the land of which a new powerhouse facility (18-ft x 12-ft) in-canal or diversion canal would be constructed. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from $1.8M – $2.3M including contingencies. The project cost range is influenced by turbine technologies, interconnection costs, environmental compliances, and other attributes of the project to be refined in subsequent analysis.
Interconnection	**Unknown**	It is assumed that within 150 ft from the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and Installation of new three-phase distribution will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole array with ground bank and step-up transformer.
Water Rights	**Go**	Per the SIP, it is assumed that EFID has the consumptive water and/or hydropower rights for this site. Documentation of hydroelectric generation rights as part of the existing water right will be required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.

Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Small hydroelectric projects are exempt from local permit requirements. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process process by applying to the ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**No-Go**	Multiple monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on conversations with stakeholders, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from negative ($794,000) to $305,000 with a simple payback ranging from 28 to 32 years assuming no grants or outside funding sources.
Recommendation	**No-Go**	Given the above revenue projections, project cost range, site location, and distance to nearest power, this project has unfavorable financial attributes. This project will require a significant grant in order to signal favorable financial attributes.

Small Hydro Feasibility Assessment for:
East Fork Irrigation District – Toll Bridge

1.0 Project Overview

NLine Energy reviewed a hydroelectric generation site located at the Toll Bridge site for East Fork Irrigation District (EFID). This Feasibility Assessment provides a "fatal flaw" summary of the site's technical, environmental, regulatory and financial feasibility as they pertain to hydroelectric project development. Table 1 overviews the "Go", "No-Go," and "Unknown" criteria as a first step to determine project viability:

Table 1: Feasibility Assessment Matrix

Criteria	Toll Bridge	Comments
Eligible Sites	**Go**	The proposed hydroelectric site is located west of the USGS Gauge Station, 7140 Toll Bridge Road, Mt. Hood, OR along the Main Canal and west of Highway 35 (45°31'24.06"N, 121°34'5.85"W). The project would consist of installing a new 850 linear foot section of pipe directly downstream of the existing sand trap / fish screen facility inside delivering flows to a hydroelectric turbine.
Data Availability	**Go**	Telemetry and metering have not yet been implemented into the EFID network but are part of the Farmers Conservation Alliance (FCA) System Improvement Plan (SIP). FCA provided the EFID SIP which included daily estimates of flow data through the Main Canal for 2010 and 2011. FCA staff confirmed on the elevation difference and the existence of any diversions between the pipe inlet (1,675 ft msl) and pipe outlet (1,650 ft msl). For this analysis, NLine Energy assumed that

		Main Canal deliveries did not vary drastically on a yearly basis and consequently used 2010 and 2011 estimated flow data as a predictor of future flows.
Hydraulic Profile	**Go**	Irrigation demands drive flow availability, typically from March through October. The Main Canal has a maximum diversion allotment of 120 cfs, most of which could be sent to the proposed hydroelectric station. The data indicates the flows range from 20 to 115 cfs with net head ranging from 20 ft to 25 ft after accounting for friction losses through the 850 ft pipe.
Technology Availability	**Go**	Multiple technologies could be implemented at this site. A Hydrodynamic Screw, Natel Energy's FreeJet™, Kaplan, Mavel's Microturbine, and Rickly's PROPEL™ Kaplan turbine technologies fit the operating parameters of the site. For this Feasibility Assessment, only the Rickly PROPEL™ Kaplan technology was analyzed. Using daily flows from 2010 and 2011 and assuming an 80 percent net efficiency, the estimated annual generation for this site was calculated as 600,000 kWh with a nameplate rating of approximately 180 kW. During subsequent analysis, all technologies would be further analyzed to determine the appropriate technology and generation profile.
Civil Implementation	**Go**	It is assumed that EFID controls the land of which a new powerhouse facility (16-ft x 24-ft) or diversion canal would be constructed. Based on historical projects of similar size and technology in NLine Energy databases, project cost estimates for a fully installed project range from $1.9M - $2.4M including contingencies, whereas the pipeline would cost an additional $85,000 to $150,000 depending on geography and soil type. The total estimated project cost is $2M-$2.55M. The project cost range is influenced by turbine technologies, interconnection costs, environmental compliances, and other attributes of the project to be refined in subsequent analysis.
Interconnection	**Unknown**	It is assumed that within 100 ft from the site, there is a Hood River Electric Cooperative (HREC), three phase distribution circuit. Substation capacity and Installation of new three-phase distribution will be analyzed in subsequent analysis. Interconnection facilities will include a new three pole array with ground bank and step-up transformer.
Water Rights	**Go**	Per the SIP, it is assumed that EFID has the consumptive water and/or hydropower rights for this site. Documentation of hydroelectric generation rights as part of the existing water right will be

		required per the Oregon Department of Water Resources (ODWR) hydroelectric permitting process.
Environmental	**Go**	It is assumed that the site will qualify for a NEPA Categorical Exclusion or Environmental Assessment based on the attributes of the site.
Permitting & Licensing	**Go**	This site qualifies for a FERC Qualifying Conduit Facility exemption through a Notice of Intent filing. Federal legislation (HR 267) signed into law in August 2013 allows for a streamlined permitting in 60 days from time of filing. Small hydroelectric projects are exempt from local permit requirements. Considering that this project would qualify for a conduit FERC Qualifying Conduit Facility exemption, EFID controls the water conveyance system, and has a certificated water right, this site would be eligible for the expedited state permitting process process by applying to the ODWR for a certificate to use the water for hydroelectric purposes under HB 2785.
Financial Benefit	**No-Go**	Multiple monetization options were identified in this analysis. As a potential PURPA Qualifying Facility, this site would be eligible for Schedule 37 through Pacific Power or Schedule 201 through Portland General Electric. Under Schedule 37, power would be wheeled through HREC before accessing the Pacific Power transmission system. Under Schedule 201, power would be wheeled through HREC and potentially Bonneville Power before reaching the Portland General Electric transmission system. Although Schedule 201 rates are up to 30 percent higher than Schedule 37 rates, Schedule 37 was used in this analysis to be conservative. The thirty-year average rate for this tariff is $0.088 per kWh. Based on conversations with stakeholders, wheeling charges vary based on the specific project; namely project capacity (kW), distance to nearest three-phase power, distance to the nearest substation, and operations and maintenance costs newly for installed distribution circuit. To be conservative, a wheeling charge of $1,000/MW/month was assumed. Furthermore, the estimated 30-year net revenue ranges from negative ($1,005,000) to ($505,000) with a simple payback of 30+ years assuming no grants or outside funding sources.
Recommendation	**No-Go**	Given the above revenue projections, project cost range, site location, and distance to nearest power, this project has unfavorable financial attributes. This project will require a significant grant in

		order to signal favorable financial attributes.