2.0 PROJECT DESCRIPTION

2.1 EL DORADO IRRIGATION DISTRICT OVERVIEW

The El Dorado Irrigation District (the District) is a public water agency located on the western slope of the Sierra Nevada mountain range in El Dorado County and serves a population of more than 100,000 people through more than 38,000 active water meter connections. The District’s water system contains more than 1,250 miles of pipe, 27 miles of ditches, five water treatment plants (WTPs), and 37 storage tanks and/or reservoirs. A total of thirty-seven pumping stations and two hundred pressure-regulating stations are needed for reliable operation of the system due to varying topography, which ranges in elevation from the heights of the Sierra Crest west of Lake Tahoe to lower foothills bordering the Central Valley near Folsom.

The District relies on surface water to meet its entire potable water demand, and one of the District’s main surface water conveyance facilities is the Upper Main Ditch, which is an unlined ditch located in the eastern region of the District within the community of Pollock Pines. Uses served by the Main Ditch include municipal, domestic, and agricultural purposes.

2.2 PROJECT OVERVIEW

The District proposes the Upper Main Ditch Piping Project (Upper Main Ditch Piping Project or Project) to convert the ditch from its current design as an open and unlined conveyance facility to a secure raw water transmission pipeline. The existing ditch is approximately 14- to 20-feet wide with the berm at bank-full width and up to five feet in depth and delivers a maximum of 15,080 acre-feet annually (afa) of raw water supplies from the El Dorado Forebay Reservoir (Forebay) near the community of Pollock Pines to the District’s Reservoir 1 WTP (a distance of approximately three miles) where it is then treated and distributed throughout the District’s public drinking water system.

The Upper Main Ditch passes through private property. The District asserts an easement across such property to own and operate the ditch for water supply conveyance. The easement right does not provide for public access along the ditch. However, a four- to five-foot side bench runs atop the outer ditch berm for District maintenance purposes, and the District is informed that some members of the public utilize this bench as a path. The ditch typically conveys raw water supplies during the spring and summer months, and is shut down for varying periods of time in the fall and winter months for maintenance. Because the ditch is open and unlined, it is susceptible to losses due to evaporation and seepage, and is also exposed to contamination from runoff and other sources.
2.3 PROJECT HISTORY

Thousands of miles of earthen/open ditches were constructed in the American River watershed in the 1800’s to support the gold mining industry. As land uses and water demands shifted from gold mining to agriculture and domestic and municipal uses, some of these ditch systems were incorporated into the water delivery systems of public and private water suppliers. Today, portions of this extensive system convey both treated and raw water to thousands of customers in the region. These earthen ditches have long served a valuable role in providing water service to the local foothill communities. However, seepage and evapotranspiration water losses from these unlined ditches presents a serious water management problem, especially during the historic drought period experienced by the State of California (State) during the period of 2011 to 2016.

In addition, substantial maintenance must be done on these systems to maintain operations, comply with water quality objectives and regulations, and meet increasing customer demand. Uncovered ditches are susceptible to contamination and failure, putting drinking water supplies at risk, and resulting in erosion and water quality issues.

The Main Ditch (also referred to as the “El Dorado Ditch”), of which the Upper Main Ditch is a part, was built by mining interests to serve mining, irrigation, and domestic water needs in the foothill area in the late 1800s. The Main Ditch historically flowed from Forebay Reservoir (Photo 2.3-1) downstream to the Placerville area. The section of the ditch from the Forebay Reservoir to the Reservoir 1 WTP is designated as the Upper Main Ditch.

The Reservoir 1 WTP (Photo 2.3-2) has a maximum production capacity of 26-million gallons per day (mgd). Raw water supplies stored at the Forebay Reservoir are conveyed through the Upper Main Ditch to the WTP, where they receive treatment to meet potable water standards. There are currently four existing District raw water customers served from the existing Upper Main Ditch, that receive water directly from the ditch before it reaches the WTP. Potable water from the WTP is stored in the Reservoir 1 storage reservoir adjacent to the WTP, and then delivered by gravity to the Camino area and to Reservoir 2/2A for distribution to other portions of the District’s western service area. A portion of the potable supplies are also pumped back uphill to the Pollock Pines Reservoir for distribution to customers at higher elevations (EID 2015).
Prior to the transfer of ownership and water rights, the District purchased water from Pacific Gas and Electric Company (PG&E) and its predecessor, the Western States Gas and Electric Co. The original water right claims date back to 1856, with additional claims being filed in the 1860s and 1870s. The water rights for diversions from Echo Lake were established in 1880 through a California Supreme Court decision. In 1918, the California Railroad Commission (predecessor to the California Public Utilities Commission) recognized the use of water from the El Dorado Ditch for irrigation and domestic purposes.

The El Dorado Ditch and the related water rights were sold to the Western States Gas and Electric Company in the early 1900s, primarily for hydroelectric power generation, although a smaller portion of the water conveyed through the El Dorado Ditch was maintained for delivery to some agricultural users. Over time, after several name changes and through agreements, the District took over the rights and responsibilities for delivering the non-power generating water to irrigation and domestic water users.

In 1997, the District took over all water rights and facilities along the original El Dorado Ditch (Federal Energy Regulatory Commission [FERC] Project 184) and, in 1999, the District acquired the entire FERC Project 184 from PG&E, after obtaining FERC License approval. Project 184 includes numerous reservoirs and associated dams, 22 miles of conveyance, a 21 megawatt (MW) renewable energy generating hydroelectric powerhouse, and other ancillary facilities.

Although the District has been considering the piping of the Upper Main Ditch for many years, the District’s interest increased in response to the recent drought, as well as in compliance with the implementation of additional state-mandated conservation requirements. The District has applied for several grants to offset the Project cost, and with the recent heightened awareness of the need for water conservation, the Project has received funding support from the Bureau of Reclamation, California Department of Water Resources, and the El Dorado County Water Agency. The technical feasibility and scientific merit for this Project has been described in the following plans:

- Water Resources Development and Management Plan – El Dorado County Water Agency (2007 and 2014);
- Integrated Water Resources Master Plan – El Dorado Irrigation District (2013); and

## 2.4 PROJECT LOCATION

The Project is located in El Dorado County, California, within the community of Pollock Pines, on the north side of U.S. Highway 50, in the Pollock Pines United States Geological Survey (USGS) Quadrangle map, Sections 25, 26, 35 and 36, Township 11 North, Range 12 East and Range 13 East. The Project traverses parcels of land owned by the District, El Dorado County, and private landowners. from Forebay Reservoir at an elevation of 3,785 feet above mean sea level (amsl) to the inlet at the District’s Reservoir 1 WTP at an elevation of 3,754 feet msl (Figure 2.4-1). The three-mile long Upper Main Ditch is fairly uniform over its length, ranging from 14- to 20-feet in width and approximately 5-feet in depth, and maintaining a slope of approximately 0.1-percent to 0.2-percent. The specific location of individual elements of the Project are presented in the following sections. Figure 2.4-1 below illustrates the location of the proposed Project while Figures 2.7-2 and 2.7-4 illustrate the location of the Blair Road and Combined Alternatives in their respective descriptions in Section2.7.
2.5 PROJECT OBJECTIVES

The purpose of the Upper Main Ditch facility is to deliver water from the Forebay Reservoir to the Reservoir 1 WTP. This is an essential part of the District’s overall water distribution system. The purpose of the Project is to deliver the water from the Forebay to the Reservoir 1 WTP in a manner that conserves water, maximizes efficiency in both water and energy usage, improves water quality, increases the generation of renewable energy, reduces the District’s system-wide operational and maintenance costs, and improves water supply reliability. The Project would result in an estimated water savings of approximately 1,800 afa on average depending on flow rates and total diversions. In addition, the Project would result in improved raw water quality and a reduced need for additional water supplies.

Because the Upper Main Ditch is currently uncovered and unlined, a portion of the water conveyed through the ditch is lost to seepage and evapotranspiration. Annual losses from the ditch due to seepage and evapotranspiration are estimated to be in the range of 11-percent to 33-percent (Tully and Young 2017), depending on flow rates and annual diversions. Based on 2009 to 2015 data, minimum water savings of approximately 1,350 acre-feet per year and an average of nearly 1,800 acre-feet can be expected to result from piping the ditch.
Implementation of the Project would assist the District in meeting water conservation mandates. Article X, Section 2, of the California Constitution requires that the State’s water resources be put to maximum beneficial use, and recognizes the role of conservation in meeting that objective:

*It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.*

In recent years, the Governor and State Legislature have undertaken several efforts aimed at maximizing water conservation, such as requiring local water purveyors to reduce water usage. Most notably, the State Legislature passed Senate Bill 7X-7 (SB 7X-7), the Water Conservation Act of 2009, which included a mandate to reduce per capita urban water usage by 20 percent by the year 2020. This is also known as the “20 x 2020” mandate. As an urban retail water supplier, the District must comply with this legislation. Also, in response to the historic drought of 2011-2016, Governor Brown issued Executive Order B-29-15, directing the State Water Resources Control Board (SWRCB) to adopt emergency regulations requiring mandatory reduction in potable usage by 25-percent statewide. The subsequently-adopted emergency regulations required the District to reduce per capita consumption by 32-percent during the height of the drought in 2015 and 2016. Also in 2016, Governor Brown issued Executive Order B-37-16 directing the SWRCB to establish a long-term framework for water conservation and drought planning that specifically targets water losses through system leaks. That Executive Order also required the SWRCB to adopt permanent regulations that eliminate water waste and such regulations are currently under consideration by the SWRCB. In response to the Governor’s call for a long-term framework for water conservation and drought planning, the SWRCB, along with several other Brown Administration agencies, issued a report titled, Making Water Conservation a California Way of Life in April, 2017. That report directs agencies at all levels of California government to implement actions aimed using water more wisely, eliminating water waste, strengthening local drought resilience, and improved drought planning. Finally, the State Legislature recently passed two bills, Assembly Bill 1668 by Assembly Member Friedman, and Senate Bill 606 by Senator Hertzberg. Together, these bills establish mandatory long-term water usage targets that will require the District to reduce water system losses, indoor residential per capita water use, outdoor irrigation, and commercial, industrial, and institutional water usage. Implementation of the Project will help the District achieve the water conservation mandates described above.

As an interim benefit of the Project, there is a potential for an increase in hydroelectric power generation in the District’s system by retention of interim supplies in Forebay Reservoir in normal water years until the full 15,080 acre-feet conveyed through the Project is needed to meet water demand. By reducing water losses from the Upper Main Ditch, more water can be left in the District’s raw water system to generate hydroelectric power. The Project’s long-term benefit, when the full 15,080 acre-feet of supply is needed to meet demand, would be a reduced need to pump water supplies out of Folsom Reservoir to meet increasing water demand.

Water used for generation at the El Dorado Powerhouse is returned to the South Fork American River, which eventually flows to Folsom Reservoir, a Bureau of Reclamation facility. Water conserved by piping the Project would be used to generate power at this powerhouse. Renewable energy generated at the El Dorado Powerhouse is sold to PG&E and distributed through the California independent system operator (ISO) grid.
The Project would also provide the benefit of improved water quality. The existing unlined and uncovered Upper Main Ditch is currently susceptible to contamination and failure, resulting in erosion and water quality issues that increase the contaminant load that must be removed by the treatment process at the WTP.

The Upper Main Ditch alignment passes through a rural residential area and the ditch flows adjacent to homes and backyards. In addition, the ditch’s bench, the flat ledge along the side of the ditch that borders the ditch, has been used by some members of the public as a path despite the designation as private property. This location and use results in the direct human and animal access to the raw water prior to it reaching the WTP.

Previous water quality analysis conducted by the District has identified increases in such contaminants as total coliform, E. coli, and turbidity as the water travels through the earthen ditch downstream from the Forebay Reservoir to the WTP. Detection of increased coliform and E. coli samples are considered potential indicators of possible contamination from animal and human feces (USEPA 2012), which may come from a variety of sources, including: general storm runoff; runoff from upstream pastures; animals in the ditch, and adjacent septic systems.

Turbidity is a measure of suspended material in water. The most likely source of increased turbidity in the Upper Main Ditch is from soil erosion in and upstream of the ditch. Sediment and contaminants entering the waterway must be removed through the treatment process at the WTP to produce potable drinking water for the District’s public drinking water system. Reducing turbidity provides an opportunity to reduce chemical treatment and solids handling costs at the WTP, and potentially reduces disinfection by-product formation and the cost of future water treatment process improvements.

In summary, the primary objectives of the Project are to:

- Reduce water loss from the Upper Main Ditch resulting from seepage and evapotranspiration, contribute to the District’s overall water conservation goals and objectives, and improve the District’s water supply reliability and sustainability;
- Protect drinking water quality by eliminating the potential for intentional or unintentional contamination of the open ditch, and improve District water security; and
- Reduce operations and maintenance costs that result from increased treatment and pumping costs associated with the additional flows entering the ditch through uncontrolled stormwater runoff from the adjacent watershed.

The Project also contributes toward the following secondary objectives:

- Reduce reliance on Central Valley Project (CVP) supplies at Folsom Reservoir;
- Aid in compliance with California’s 20 percent water conservation by 2020 mandate and additional conservation requirements mandated by the State through Executive Order B-37-16 (Making Water Conservation a California Way of Life), conservation regulations adopted by the SWRCB, and long-term conservation legislation adopted by the Legislature;
- Improve sustainability in terms of maintaining existing water supplies for future needs; and
- Provide water for renewable hydroelectric power generation (interim).
2.6 PROPOSED PROJECT

2.6.1 Proposed Project Details

The purpose of the proposed Project is to convey the District’s raw water supplies from the Forebay Reservoir to the Reservoir 1 WTP in a manner that conserves and uses water more efficiently and effectively, improves water quality, conserves energy and improves energy efficiency, increases the generation of renewable energy, and assists in preventing water-related crises. The proposed Project would result in an estimated water savings of approximately 1,800 afa on average, improve raw water quality, and reduce the need for new water supplies.

The proposed Project begins at the outlet of the Forebay Reservoir (Photo 2.6-1) and ends at the inlet to the Reservoir 1 WTP (Figure 2.6-1). The proposed Project includes construction of a new pipe connection downstream of the Forebay Valve House, piping of the water supply currently conveyed through the ditch in a buried 42-inch pipeline and improvements to the inlet facility at the Reservoir 1 WTP to include construction of a new metering vault and a new energy dissipation structure at the end of the discharge pipe.

The major components and tasks for the proposed Project include:

- Obtaining construction access, staging, and temporary and permanent easements;
- Grading and compaction work associated with preparation of construction and staging areas;
- Grading and compacting of the existing ditch bed;
- Tying into outlet pipe downstream of Forebay Reservoir Valve House;
- Installing approximately 15,400 linear feet of 42-inch pipe;
- Removing vegetation within 10-feet of the existing top of uphill bank and within 10- to 20- feet on the downhill top of ditch bank (width varies within this range depending on exact location of pipeline within the alignment);
- Installing associated appurtenances such as access manholes, turnouts, meters, valves, and connections;
- Reestablishing four existing raw water services;
- Constructing a new WTP inlet structure and flow measurement vaults at the Reservoir 1 WTP headworks; and
- Improving the supervisory control and data acquisition (SCADA) system automation and instrument control for flow and water quality measurements.
2.6.2 Proposed Project Components

As part of the preliminary analysis for the proposed Project, the District considered maximum and minimum operating water surface elevations in the Forebay Reservoir as a baseline for its hydraulic calculations. Based on a maximum design flow of 40 cubic feet per second (cfs), and a minimum flow of seven (7) cfs, the analysis recommended a 42-inch diameter pipe to convey the water supply that is currently conveyed through the Upper Main Ditch. Various pipe materials were considered including: Polyvinyl Chloride (PVC), Ductile Iron Pipe (DIP), Steel, and High-Density Polyethylene Pipe (HDPE). Final pipe material selection will be made when the Project is bid for construction.

The District considered several pipeline alignment alternatives to achieve the goals and objectives of the Project, including the proposed Project alignment, which follows the existing ditch alignment for the entire 15,400 feet. The District selected the proposed Project as the preferred alignment based on a number of factors, including ease of installation and overall cost. A discussion of the unique characteristics of the other alternatives is found in Section 2.7. The proposed Project shares many components with the other alternatives and the proposed Project details and elements common to the proposed Project and the alternatives are discussed below.

The proposed Project would follow the existing ditch beginning at the upstream end, as shown in Figure 2.6-1, with an air/vacuum release valve at the Forebay Reservoir Valve House. The new pipe would be placed within the ditch and backfilled with engineered fill and select backfill material. A reshaped ditch would be left in the compacted surface to allow for passage of stormwater flows up to the current 10-year storm event capacity. There are currently four existing District raw water customers served from the existing Upper Main Ditch. Four new service lines from the proposed Project pipeline in the ditch will be required to reconnect to the existing raw water services pursuant to the District’s existing policies and procedures. At the downstream end, a metering and inlet structure would also be constructed within the ditch to turn water into the Reservoir 1 WTP. In addition, minor earthwork, including tree removal, would be required to improve channel geometry, and prevent groundwater from undermining the pipe. The method employed for construction of the pipe would utilize heavy equipment to grade the ditch section to a uniform slope, fill areas that have eroded and compact the soil to prevent settlement.

2.6.2.1 Temporary and Permanent Easements

The District’s existing easement for the Upper Main Ditch is 50-feet on either side from the marginal limit of the ditch and provides the District with the right to own, operate, and maintain the existing ditch and make necessary and appropriate improvements to the ditch for the purpose of conveying District water supplies. The ditch footprint (top of bank top to top of bank) varies between 10- and 20-feet, meaning that the existing easement varies between 110- and 120-feet.

In order to convert the existing unlined ditch to a piped system, the District will need to obtain new easements both permanent and temporary. Permanent easements across private property of approximately 40-feet in width along the pipeline alignment are necessary to provide the District with the rights to install, maintain, and operate the pipeline. In addition, temporary construction easements of varying width would be necessary to construct the new pipeline.

The proposed Project Footprint figure illustrates existing and proposed easements and boundaries (Figure 2.6-1). Like the District’s existing easement, the new permanent easement would provide the right for the District and its contractors to access the pipeline but would not include any public right of access.
Additional temporary construction easements would be necessary to provide staging areas and any required access outside the existing easement (also shown on Figure 2.6-1). Access to construction areas would be a minimum of 12-feet wide adjacent to and over the pipeline on the downslope side of the ditch. As such, construction activities would be focused within the existing ditch footprint and, for the most part, take place on the downslope half of the existing easement corridor, which would limit disturbance to the upslope side of the ditch, except for the removal of trees on the edge of the ditch that present a falling hazard. The pipeline would generally follow the existing ditch; however, where the pipeline is located on the uphill side of the ditch, construction activities would disturb up to 20-feet of that uphill half of the existing easement. Thus, the construction corridor would vary in width with an average maximum width of approximately 40- to 50- feet. Staging areas would be utilized for placement of a construction trailer, storing equipment, fill material, and construction materials.

2.6.2.2 Vegetation Removal

The existing ditch provides a utility corridor generally free of trees. However, some trees have established themselves within the ditch alignment. The proposed Project has been designed to minimize tree removal by following the existing ditch corridor as much as feasible. However, construction and operation of the proposed Project would require some removal of trees adjacent to the existing ditch corridor. To prevent degradation of the proposed Project pipe installation due to root intrusion, all existing woody vegetation, including trees, would be removed within the existing ditch up to the top of the uphill bank of the ditch. Also, any woody vegetation including trees within 10-feet of the top of bank on the uphill side of the ditch that are deemed a falling hazard or unsafe would be removed. Woody material including trees within 10- to 20-feet of the ditch downhill of the top of bank would also be removed and prevented from reestablishment. In limited areas where the pipeline alignment is uphill of the existing ditch, trees would be removed within 10- to 20-feet of ditch uphill of the top of bank.

Figure 2.6-2 (Panels 1 through 3) illustrates the approximate location of trees to be removed as a part of the Project. There are approximately 50 trees located on the existing ditch bench and roughly 400 trees located within the ditch alignment. Overall, approximately 335 trees at various locations on the proposed pipeline alignment would likely need to be removed as a part of the proposed Project. Figure 3.1-4 in the Aesthetics Section (3.1) illustrates additional details of tree removal. Trees may also be affected by fill placement resulting from berm reshaping.
2.6.2.3 Pipeline Grading and Compaction

The following steps are anticipated in the construction and installation of the proposed Project in the sections where the pipeline would be placed substantially under the existing ditch or the berm, and substantially within the ditch footprint:

- **Step 1** – Clearing and grubbing existing ditch and bench to a maximum of 10-feet (as needed) of the uphill top of ditch bank to a maximum of 20-feet (as needed) of the downhill top of bank on either side in preparation for placement of pipe and access;
- **Step 2** – Scarifying and compacting the existing ditch subgrade in preparation of fill;
- **Step 3** – Reshaping and placing fill within the existing ditch;
- **Step 4** – Trenching and installation of the pipe
- **Step 5** – Backfilling the pipe with specified bedding material and compacting, with the final backfill reestablishing the ditch with the 10-year recurrence interval storm event capacity and incorporating a v-ditch for intermittent flow using soil from the trench that would be temporarily stored on the bench.

Where the pipeline alignment follows the existing ditch, the alignment would vary between being completely under the existing ditch to partially under the ditch and partially under the berm, to completely under the berm. In areas where the pipeline would be completely under the berm the pipeline would be farther below the ground surface than the portions under the ditch. Prior to pipe installation, the bottom of the trench would be prepared to be firm, smooth, free of standing water, and free of any soft or hard spots, large rocks, and any foreign material.

Figure 2.6-3 below provides an example of a cross-section showing what the proposed pipeline alignment would look like after construction. Backfill in the pipe trench above the pipe zone and in the remaining ditch section would be free from organic matter, debris, and rocks larger than six-inches in diameter or length, and compacted to at least 90-percent, and 95-percent at road crossings. Imported granular bedding material would be used to level out the irregular trench bottom and to allow an easily shaped bedding surface. Approximately 46,000 cubic yards of imported fill would be required for the proposed Project.

A remnant channel would be left in the compacted surface for sections of the alignment within the existing ditch to allow storm water flows from the upslope watershed to continue following pre-Project drainage patterns. For areas where the pipeline alignment is not within the existing ditch, the ditch would be partially filled and reshaped to provide a similar level of stormwater capacity for flows up to the 10-year event. Flows in excess of the 10-year event would pass over the alignment and follow the natural drainage courses as they do under existing conditions. The balance of the compacted cover surface would have an average two-percent downgradient slope.
Pipeline Access

Access to the proposed Project would be limited to a few locations due to the existing topography and lack of access roads. The proposed Project has sufficient area to allow District personnel to access all points along the alignment from public roads that cross the Upper Main Ditch and from new easements that would be acquired. The access is assumed to be a minimum of 12-feet wide adjacent to and over the pipeline. The entire access would be located within existing and any newly acquired easements.

To efficiently construct the new pipeline, it is anticipated that placement of the pipe would occur in one direction with construction traffic (i.e., excavation equipment, rock and water trucks, backhoes, and excavators) flowing in the same direction between the nearest upstream and downstream access points. The one-way traffic would keep equipment moving during construction, so the bench would need to be cleared and maintained open as construction moves along. Completed backfilling of the pipe trench to proposed finished grade would provide the necessary support for the construction equipment.

2.6.2.4 Appurtenances

Isolation Valves

The installed pipeline would connect to the Valve House at the Forebay Reservoir where a 36-inch bonneted knife gate valve (a valve which opens by lifting a round or rectangular gate/wedge out of the path of the water) would be available to isolate flows from the reservoir. A pair of additional throttling valves would be installed at the downstream end of the proposed Project at the inlet into the Reservoir 1 WTP. These valves would be utilized to accurately regulate the flows to the desired flow rate. This installation is common to all the alignments considered. An
INTERMEDIATE ISOLATION VALVE

Intermediate isolation valve would be placed near the middle of the installed pipeline reach to allow for dewatering a portion of the pipeline (if necessary).

Air/Vacuum Release Valves

Combination air/vacuum release valves (AVRV) would be located at all significant high points along the installed pipe alignment, on constant slopes every 1,000 feet, and installed on the downstream side of isolations valves. AVRV's release air trapped in the line, primarily during filling, and allow air into the line during emptying of the pipeline. Based on preliminary design, it is anticipated that the AVRV's would be approximately six-inch valves, but actual size would be confirmed during final design.

Blow-off Valves

Blow-off valve (BOV) assemblies would be located at low points in the installed pipeline and upstream of isolation valves to facilitate line draining, and to allow the removal of sediments that may accumulate in the low areas. Based on a preliminary sizing, it is anticipated the BOVs would be six-inches to eight-inches in size, but size would be confirmed during final design.

Manways

Manways would be located at strategic locations (possibly near services and roadway access points) to facilitate inspection of the installed pipeline. A manway would consist of a vertical tee in the pipeline with a bolted blind flange. The vertical tee would be 24-inch in diameter for easy access. Accessories would likely include a concrete box cover and lid, and a lifting ring on the blind flange.

2.6.2.5 Pipeline Connection at Forebay Reservoir Valve House

As part of the El Dorado Forebay Dam Project (SCH#2013032036), the existing Valve House would be relocated further downstream along the Upper Main Ditch and a 36-inch steel pipe through the dam would be extended to accommodate the widened dam. Each of the alignments considered for the proposed Project would connect the 36-inch steel pipe to the new 42-inch pipe at this location. Depending on the sequence of this Project in relation to the El Dorado Forebay Dam Project, if the proposed Project is constructed first, then the Valve House relocation and associated improvements would be included in the proposed Project.

2.6.2.6 Inlet Structure at Reservoir 1 WTP

A new structure at the inlet to the WTP would be installed to house a magnetic flow meter and throttling valve and to dissipate energy from the pipeline entering the treatment plant headworks. The proposed structure would consist of two enclosed concrete boxes each approximately 15-feet long by 9-feet wide by 8-feet high. One would house the meter and throttling valve and the other would act as the energy dissipater.

The boxes would have appropriate openings in the structure for District access and cleaning. Due to anticipated daily fluctuations in the Forebay Reservoir water surface elevation, the throttling valve would be automated to regulate the flows to the Reservoir 1 WTP. The existing SCADA system that monitors flows in the Main Ditch would be expanded.

2.20
to provide real-time data on the flow and volume entering the plant. The structure would have a sump to collect any debris that may enter the system at the Forebay Reservoir intake. The level of debris would be monitored and cleaned by the District, as needed. Emergency overflow would continue into the Main Ditch downstream of the Reservoir 1 WTP as it does currently.

2.6.2.7 Stormwater Considerations

In addition to water deliveries from Forebay Reservoir, the Upper Main Ditch passively intercepts stormwater runoff that would otherwise naturally flow down slope. The drainage area of the Upper Main Ditch between Forebay and Reservoir 1 WTP is approximately 315 acres (Figure 2.6-4). The final design of the constructed pipeline alignment surface leaves a remnant channel in place, thereby allowing stormwater for 10-year storm flows to continue following pre-Project drainage patterns (see Figure 2.6-3, Figure 2.6-4 and shown on the 60-percent design drawings in Appendix B.8).
2.6.2.8 Proposed Construction Activities

Construction of the proposed Project is anticipated to be completed within two consecutive construction seasons during the annual Upper Main Ditch outage (fall and winter months). Depending on construction sequencing and water demand patterns it is possible that construction could extend into the first quarter of the following year, but prior to the increase in consumptive water demands.

2.6.2.9 Construction Equipment

Contractor equipment could include construction office and equipment trailers; warehousing and equipment maintenance facilities; and fuel pumps and fuel storage tanks. Mobile construction equipment utilized for the Project would depend on the selected contractor’s planned operations, but may include the following equipment:

- Excavators
- Scrapers
- Bulldozers
- Graders
- Rollers
- Concrete trucks
- Asphalt trucks
- Compactors
- Conveyors
- Water trucks
- Off-road hauling trucks
- Vehicle maintenance truck
- Front-end loaders

- Pickup trucks
- Air compressors
- Welding equipment
- Pumps and piping
- Generators
- Back-up lighting systems
- Communications and safety equipment
- Timber harvesting equipment
- Erosion control materials
- Highway trucks
- Cranes
- Miscellaneous equipment customary to the mechanical and electrical crafts, and vehicles used to deliver equipment and materials

2.6.2.10 Access Roads and Staging Areas

Access to the Project site would be accomplished using established roads including, but not limited to, U.S. Highway 50, Sly Park Road, Pony Express Trail, Forebay Road, Blair Road, Gilmore Road, Patrick Lane, Pony Express Court, and Pinewood Lane, which are paved, all-weather roads suitable for the anticipated loads. Potential site access and staging areas are shown on Figure 2.6-1 and local construction access routes are shown in greater detail on Figure 2.6-5.

Project activities would require the limited use of private property driveways from these roads; roads and driveways would be repaired to pre-construction conditions. Staging areas would be selected and developed by the contractor within limits approved by the District and by separate agreements with landowners. Several potential staging areas and temporary easements have been identified (Figure 2.6-1).
2.6.2.11 Construction-Related Traffic

Highway and local road truck trips would include mobilization activities and transport of commercially-quarried materials, construction materials, and segments of pipe, as well as trips related to waste disposal and tree removal. Engineered fill would be obtained from a specified commercial sand and gravel operation or other suitable and authorized sites. The on-site haul trips include the transport of borrow and excavated materials, construction materials, pipe, waste disposal, and tree removal.

2.6.2.12 Backfill Material

California Department of Transportation (Caltrans) identified two available backfill material sites, Piney Point and Bullion Bend, which are located within a 6-mile radius (and 4-miles of one another) east of the Upper Main Ditch site along the Highway 50 corridor. Both sites are used by Caltrans to stockpile materials (i.e. soil, rock, debris) from landslide and highway maintenance operations. It is expected that the District could take as much material as needed from either site, although agreements/permits with both United States Forest Service (USFS) and/or Caltrans would be required. The material at these sites may not be suitable without significant processing (Domenichelli and Associates 2016). If the material is used, the District would be responsible for all costs associated with processing and hauling the material, and erosion and sediment control measures. Vehicle access and staging areas at both sites are considered adequate, though traffic control measures would likely be necessary to ensure public safety.

2.6.2.13 Construction Schedule

The preliminary Project schedule includes mobilization, construction, testing, and final completion of the proposed Project within a two-year period with mobilization and construction activities occurring during the annual fall/winter ditch outage. The Reservoir A WTP can typically satisfy demands through March if needed to accommodate an extended outage of the Upper Main Ditch. The work week for construction activities is generally anticipated to occur Monday through Friday although weekend work may be necessary due to weather limitations.

In total, approximately 15,400 feet of 42-inch waterline would be installed, tested, and accepted by the District. Pipe installation and backfill is the largest single activity and is estimated to occur over approximately 30 weeks (7-months) split between two construction seasons. Construction progress would vary from 100-feet per day to 200-feet of pipe per day depending on site specific conditions. An additional 4-6 weeks (approximately 1- to 1.5-months) would be required to construct the inlet structure at the Reservoir 1 WTP; however, some of these activities may be done concurrently. The total construction timeline for the proposed Project would be approximately 12 months spread over two construction seasons and the breakdown of the construction timeline would be as follows (Table 2.6-1):
**Table 2.6-1 Approximate Proposed Project Construction Timeline**

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Approximate Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>1 Month</td>
</tr>
<tr>
<td>Clearing and Grubbing</td>
<td>1 Month</td>
</tr>
<tr>
<td>Placement of Pipeline Season 1</td>
<td>3.5 Months</td>
</tr>
<tr>
<td>Placement of Pipeline Season 2</td>
<td>3.5 Months</td>
</tr>
<tr>
<td>Placement of Tie-Ins, Services, and Other Appurtenances</td>
<td>2 Months</td>
</tr>
<tr>
<td>Final Testing, Surface Restoration, and Construction Closeout</td>
<td>2 Months</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12 Months</strong></td>
</tr>
</tbody>
</table>

### 2.6.3 Project Operation and Maintenance

Operation and Maintenance (O&M) of the pipeline would require less work and fewer interruptions of service than the current open and unlined ditch. The District would follow its standard O&M protocols as for other pipelines in the District’s service area.

### 2.7 ALTERNATIVES

The primary purpose of the proposed Project is to deliver water from the Forebay Reservoir to the Reservoir 1 WTP in a more safe, efficient, and effective manner than the current unlined and uncovered ditch system. The primary objectives are to conserve water conveyed by reducing seepage and evapotranspiration and improve water quality by reducing or eliminating potential contamination.

A range of conceptual alternatives were first identified and evaluated, including the required “No Project” alternative, which would leave the operation of the ditch system in its current state. Other alternatives included lining the ditch, as well as consideration of alternative pipeline alignments, including utilizing the existing ditch (the proposed Project), an alignment that utilized a portion of Blair Road, and a combined alternative.

Public comments received for the proposed Project were thoroughly evaluated and considered while developing project alternatives. In addition to written and verbal comments received since the Notice of Preparation/Initial Study (NOP/IS) was issued on June 17, 2015, the District held a scoping meeting at Pollock Pines Community Center on June 29, 2015, to accept comments on the proposed Project and potential alternatives. The alternative selection and descriptions are discussed in the following sections.

#### 2.7.1 Alternative Selection

#### 2.7.1.1 CEQA Requirements

Section 15126.6(a) of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives.
An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that foster informed decision making and public participation. An EIR is not required to consider alternatives that are infeasible. The Lead Agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. Section 15126.6(b) further states the purpose of the alternatives analysis, as follows:

*Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code [PRC] Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.*

The CEQA Guidelines further require that the alternatives be compared to the project’s environmental impacts and that the “no project” alternative be considered (CEQA Guidelines Section 15126.6[d] [e]). In defining “feasibility” CEQA Guidelines Section 15126.6(f)(1) states:

*Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.*

In determining what alternatives should be considered in the EIR, it is necessary to acknowledge the goals and objectives of a project, the project’s significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, an EIR must contain a discussion of “potentially feasible” alternatives, the ultimate determination whether an alternative is feasible or infeasible is made by the Lead Agency’s decision-making body (Public Resources Code [PRC] Section 21081[a][3]).

The CEQA Guidelines suggest the EIR should identify any alternatives that were considered by the Lead Agency but have been rejected as infeasible during the planning or scoping process. This discussion must include a brief explanation regarding the reasons underlying the lead agency’s determination. Among the factors listed in the CEQA Guidelines to eliminate alternatives from further consideration are: failure to meet the basic objectives of the proposed Project; infeasibility; and inability to avoid significant environmental impacts. In this case, the purpose of the Project is to deliver water from the Forebay Reservoir to Reservoir 1 WTP in such a manner as to minimize system losses and reduce the potential for contamination.

Again, the alternatives considered are to be limited to those that would avoid or substantially lessen any of the significant effects of the proposed Project (CEQA Guidelines Section 15126.6 [f]), while still addressing the goals and objectives of the Project. Alternatives that are not considered feasible are not to be considered, and the range of alternatives that are considered must be reasonable. Section 15126 of the CEQA Guidelines requires an EIR to identify and discuss a No Project Alternative, as well as a reasonable range of alternatives to the proposed Project.
All alternatives considered involve conveyance of raw water from the Forebay Reservoir to the Reservoir 1 WTP. The alternatives originally considered, therefore, are as follows:

- No Project Alternative (i.e., maintaining the use of the existing unlined, uncovered ditch);
- Lining Alternative (i.e., maintaining use of the existing ditch alignment, but lining the ditch with an impervious material to reduce or eliminate water losses through percolation);
- Piping Alternative (i.e., conveying flows through an appropriately-sized pipe). Several pipeline alignments were considered as discussed below in Section 2.7.1.3.

Each of the alternatives shares some common features, including the connections to the outlet facility at the Forebay Reservoir and to the inlet facility at the Reservoir 1 WTP at the site where the existing ditch enters the headworks structure.

2.7.1.2 Alternatives Selection Methodology and Screening Criteria

A range of potential alternatives was developed and subjected to the screening criteria. Several representative alternatives were considered consistent with CEQA Guidelines. The following criteria were used to screen potential alternatives:

- Does the alternative meet most or all of the project objectives?
- Is the alternative potentially feasible?
- Would the alternative substantially reduce one or more of the significant impacts associated with the project?

Based on the State CEQA Guidelines, “feasible” is defined as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors” (CEQA Guidelines Section 15364). CEQA does not require that an EIR determine the ultimate feasibility of a selected alternative, but rather that an alternative be potentially feasible.

The significant effects of the proposed Project may include those that are significant and unavoidable or that are less than significant with mitigation. The alternative should provide a means of reducing the level of impact that would otherwise result from implementation of the proposed Project. Those alternatives that meet all or most of the Project objectives, that are potentially feasible, and that would reduce one or more of the proposed Project’s impacts are discussed in greater detail below.

2.7.1.3 Alternatives Considerations

Three primary pipeline alignment alternatives are being considered in detail by the District (Figure 2.7-1):

- The proposed Project, which follows the existing ditch alignment between the Forebay Reservoir and Reservoir 1 WTP;
UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018

- The Blair Road Alternative, which mainly follows Blair Road with short portions following the existing ditch alignment and a couple “cross-country” segments for the distance between the Forebay Reservoir and Reservoir 1 WTP; and

- The Combination Alternative, which combines components of the proposed Project with the Blair Road Alternative connecting the alignment in segments of Blair Road with the alignment in segments of the existing Upper Main Ditch by utilizing “cross-country” segments between the Forebay Reservoir and Reservoir 1 WTP.

Preliminary engineering studies and options reports, included in Appendix B, evaluated the feasibility of the three alternative alignments equally, including such factors as the ease of installation, easement acquisition requirements, O&M considerations, as well as on cost considerations.

Based on these evaluations, the proposed Project was selected as the preferred alignment by the District based on several factors, including: Project feasibility and effectiveness in achieving Project objectives compared to the alternatives, lack of substantial environmental benefits offered by the alternatives, and reduced impacts from the reduced O&M activities that would result from constructing the Project.
2.7.1.4 Alternatives Considered but Eliminated from Further Consideration

Section 15126.6(f) states: “The range of alternatives required in an EIR is governed by a ‘rule of reason’ that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the objectives of the project.”

An alternative that would line the Upper Main Ditch using concrete, gunite, or other similar material, was considered by the District. This alternative could potentially address some of the objectives associated with piping the ditch, including reducing potential water losses due to percolation. However, the ditch would remain open with the lining and subject to evaporative losses, and the flows would still be vulnerable to stormwater inflow, resulting in sedimentation and potential contamination, and the impacts to water quality and to operations at the plant would still remain. As a result, this potential alternative was determined to not meet most of the project objectives and was eliminated from further consideration.

Other potential pipeline alignments were also dismissed from further evaluation due to such factors as lack of significant environmental benefits when compared with the preferred alternative, potential adverse effects on existing infrastructure (roads) and neighborhoods, ease of installation, easement acquisition requirements, hydraulic constraints, O&M considerations, as well as on cost considerations.

2.7.2 Proposed Alternatives

As noted, the alternatives considered in detail by the District include the No Project Alternative and the Piping Alternative, which includes several potential alignments, including the proposed Project, the Blair Road Alternative, and the Combined Alternative. The piping alternatives meet the basic objectives of the proposed Project and are considered potentially feasible. As such, the alternatives, along with the No Project Alternative, will be evaluated for their potential to lessen one or more potentially significant impacts (CEQA Guidelines Section 15126).

Based on the information received, the alternatives to the proposed Project are as follows:

- No Project Alternative
- Piping Alternatives
  - Existing Upper Main Ditch (the Proposed Project);
  - Blair Road Alternative; and
  - Combined Alternative.
2.7.2.1 Blair Road Alternative

General Blair Road Alternative Details

The Blair Road Alternative (Figure 2.7-2 and 2.7-3), is approximately 12,300-feet in length. The Blair Road Alternative would begin at the Forebay Valve House and cut cross-country across District-owned property approximately 400-feet to reach Blair Road. The Blair Road alignment would then remain within the existing public right-of-way of Blair Road for approximately 8,200-feet until it reaches the existing ditch crossing. From there, the Blair Road Alternative alignment would continue in the existing ditch for approximately 1,500-feet before traveling approximately 2,200-feet cross-country across private property to the Reservoir 1 WTP.

The section of the Blair Road Alternative that would be installed in the existing ditch would be constructed in the same manner as the proposed Project. The transition between the non-constructed sections of ditch and constructed sections of ditch would leave a graded slope in place to allow normal gravity flow of stormwater within the channel to be conveyed as under the current (No Project) conditions.

Blair Road is a County road and approximately 24-feet in width. There are no sewer facilities located within Blair Road, but there is a six-inch asbestos cement (AC) potable water line located within a portion of Blair Road from Pinewood Lane to Apple Creek Court. Since the new line is a raw water pipeline, California Department of Public Health separation standards for the two pipelines will apply. An El Dorado County encroachment would be obtained and would define pavement replacement requirements.

Due to the road width of Blair Road, this alternative would primarily be within the paved roadway, and trenches along the roadway would need to be minimized. The depth of trench required for the pipe would require additional trench safety equipment including shoring and trench plates. Existing drainage along Blair Road includes multiple culverts that would require deeper trenching to cross the new pipeline under the culverts, which would require additional air release valves and blow-off valves. The trench in Blair Road would be approximately five feet in width, and the total width of pavement removal would be seven feet to allow an additional one foot on each side of the trench (T-trench) to be removed.

There are currently four existing District raw water customers served from the existing Upper Main Ditch, and continuation of service to these customers would be provided. Four new service lines would be required from the proposed pipeline in Blair Road to reconnect to the existing services.
Legend:
- Blair Road Alternative Footprint
- Existing Ditch Alignment Corridor
- Proposed Staging and Access
- Reservoir 1: Treatment Plant
- Raw Water Service

Project Location:
Provenance: Stantec
Prepared by: Stantec
Scale: 1:4000

Client/Project:
El Dorado Irrigation District
Upper Main Ditch Piping Project

Paper No.: 2.7-3
Panel 2

Proposed Blair Road
Alternative Footprint
Blair Road Alternative Components
Temporary and Permanent Easements

The Blair Road Alternative would require the fewest number of permanent easements by utilizing the existing Blair Road public right-of-way. Most of this alternative follows Blair Road; thus easement acquisitions would not be necessary along the existing road. Under the Blair Road Alternative, the connection from the Forebay Valve House to Blair Road would be on District-owned property. The Blair Road Alternative would require new permanent easements on approximately 2,200 feet of private property along the cross-country sections and would require renegotiation of easements and access for 1,500-feet of right-of-way along the existing ditch alignment. The District will need to obtain new easements across private parcels to provide the District with the rights to install, maintain, and operate the pipeline.

Vegetation Removal

The Blair Road Alternative would avoid tree and vegetation removal where feasible. However, with this alternative, tree removal may be necessary at narrow points along Blair Road and would be required within the densely treed cross-country portions. Approximately 100 trees would be removed along the cross-country portions and another approximately 25 trees would be removed during construction within the ditch portion of this alternative. The pipeline alignment in Blair Road may require approximately 20 trees to be removed in narrow areas. Operations of the pipeline would prevent the establishment of woody vegetation over the top of the cross-country portions to prevent degradation of the proposed pipe due to root intrusion. A total of approximately 145 trees would be removed for this alternative. Actual trees to be removed would be determined during final design, based on proximity to pipe, construction access, and hazard trees.

Pipeline Grading and Compaction

Since this alternative follows Blair Road for most of the alignment, the grading and compaction would be different from the proposed Project. Trenches would have to be excavated along the road to approximately 7- to 8-feet in depth. The total width of pavement removal would be seven feet with an additional one foot on each side of the trench, however, due to the width of the road, it is essential for trenching to be minimized as much as possible. Trench safety measures such as shoring and trench plates will be utilized to support the minimized trenching efforts.

The culverts that intercept many portions of Blair Road would require deeper trenching and additional blow-off and air release valves (described under their respective headings in the Project Description of the proposed Project).

Appurtenances

Under this alternative, isolation valves, air release valves, blow-off valves, and manways would still all be required. As discussed above, additional blow-off valves and air release valves would be needed along the Blair Road portion of the alignment. Access to these valves and manways for operations and maintenance would be easier due to the location along Blair Road.

Blair Bridge Undercrossing

The Blair Road Alternative would cross under Blair Bridge. The District has coordinated with El Dorado County to ensure that the updates to the bridge would not impact the Blair Road Alternative should the District approve it.
Pipeline Connection at Forebay Reservoir Valve House

Under the Blair Road Alternative, the pipe would be connected at the Forebay Reservoir Valve House. No additional changes would be made to the construction or location of this connection from the proposed Project versus the Blair Road Alternative.

Inlet Structure at Reservoir 1 WTP

The Blair Road Alternative would require an inlet structure at Reservoir 1 WTP. The inlet structure under this alternative would be the same as the proposed Project.

Stormwater Considerations

Since this alternative would be located along Blair Road, additional stormwater factors would need to be considered for runoff from the road and the surrounding area. Additional blow-off valves and air release valves would be required due to presence of low points along this alternative. The stormwater considerations under the Blair Road Alternative would be similar to the proposed Project for the portions that will be piped within the Upper Main Ditch. The section of the Blair Road Alternative that would be installed in the existing ditch would be constructed in the same manner as the proposed Project and the transition between the constructed sections and non-constructed sections of ditch would include a graded slope to allow normal gravity flow of stormwater within the channel as under the current (No Project) conditions. The ditch would continue to have the capacity to passively receive and convey stormwater flows during storm events. Except where the Blair Road Alternative would be located within the existing ditch corridor, the District would no longer use the existing ditch under this alternative. As such, the District’s existing easements across private parcels to own and operate the unused portions of the ditch would revert to the underlying property owners. The District would take appropriate future maintenance actions within its pipeline easement rights to maintain the ditch as necessary to protect and maintain District facilities. Additionally, for the portions of the Blair Road Alternative that would go through cross-country terrain, the pipeline would be placed underground and the surface would be regraded with a two-percent cross slope over the pipe for maintenance purposes.

Proposed Blair Road Alternative Construction Activities

Construction Equipment

The construction equipment necessary for the Blair Road Alternative would be similar to the proposed Project, however, additional trench safety equipment including shoring and trench plates would be needed. Additionally, repaving and road repairs for impacts to Blair Road would be included.

Access Roads and Staging Areas

Similar to the proposed Project, access to the Blair Road Alternative site would be accomplished using established roads including, but not limited to, U.S. Highway 50, Sly Park Road, Pony Express Trail, Forebay Road, Blair Road, Gilmore Road, and Pony Express Court, which are paved, all-weather roads suitable for the anticipated loads. Potential access routes and alternative access routes are described and shown in greater detail in Section 2.6.2.13 and on Figure 2.6-5. All staging areas would be selected and developed by the Contractor within limits approved by the District and by a separate agreement developed with landowners.
UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018

Construction-related Traffic

Traffic controls for operation within Blair Road would be implemented to maintain residential access along Blair Road. Lane closures would be required for construction within the roadway and traffic controls would be required. Additionally, long term operations and maintenance activities would require short-term lane closures to conduct inspections, and routine or emergency repair work.

Backfill Materials

The potential borrow sites for the Blair Road Alternative would be the same as the proposed Project.

Construction Schedule

The construction time for the Blair Road Alternative would be slightly longer than the proposed Project (described in Section 2.6.2.1.3) due to a significant length of pipeline installation within Blair Road; however, construction would be continuous and only one outage period would be needed to construct sections of pipeline in the existing ditch alignment. Construction of the Blair Road Alternative would include mobilization, clearing and grubbing work, placement of the pipeline, placement of tie-ins and other appurtenances, and a final testing stage followed by surfacing (paving) activities and construction site cleanup. The total construction timeline for the Blair Road Alternative would be approximately 13 months and the breakdown of the construction timeline would be as follows (Table 2.7-1):

Table 2.7-1 Approximate Blair Road Construction Timeline

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Approximate Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>1 Month</td>
</tr>
<tr>
<td>Clearing and Grubbing</td>
<td>1 Month</td>
</tr>
<tr>
<td>Placement of Pipeline in the Roadway</td>
<td>5 Months</td>
</tr>
<tr>
<td>Placement of the Pipeline in Cross-County Portions and within Existing Ditch</td>
<td>2 Months</td>
</tr>
<tr>
<td>Placement of Tie-Ins, Services, and Other Appurtenances</td>
<td>2 Months</td>
</tr>
<tr>
<td>Final Testing, Surface Restoration, and Construction Closeout</td>
<td>2 Months</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13 Months</strong></td>
</tr>
</tbody>
</table>

2.7.2.2 Combined Alternative

Combined Alternative General Details

The Combined Alternative as shown on Figure 2.7-4 and Figure 2.7-5, is approximately 11,900 feet in length and is a combination of portions of the proposed Project and the Blair Road Alternative, as well as additional cross-country sections. Starting at the Forebay Valve House, the Combined Alternative alignment follows the Blair Road Alternative going cross country approximately 400-feet then following Blair Road for approximately 3,200-feet. Once the Combined Alternative is west of Apple Creek Court, the alignment heads south traveling cross-country approximately 700-feet until it meets the existing ditch. From there the Combined Alternative follows the proposed Project alignment.
UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018

for approximately 2,200-feet before cutting cross-country for approximately 800-feet and rejoining the existing ditch for another 2,400-feet. It is in this segment where the existing ditch crosses under Blair Road that the Combined Alternative would follow the Blair Road Alternative again as it goes cross-country out of the ditch to Reservoir 1 WTP for approximately 2,200-feet.

Combined Alternative Components

Temporary and Permanent Easements

The Combined Alternative would require fewer permanent easements than the proposed Project since part of the alignment is within Blair Road public right-of-way. As with the Blair Road Alternative the connection from the Forebay Valve House to Blair Road is on District-owned property. The Combined Alternative would require permanent easements on 3,700-feet of private property and renegotiation of easements and access for the 4,600-feet of right-of-way along the ditch. The District will need to obtain new easements across private parcels to provide the District with the rights to install, maintain, and operate the pipeline.

Vegetation Removal

The Combined Alternative would avoid tree and vegetation removal where feasible. However, with this alternative, tree removal may be necessary at narrow points along Blair Road and would be required within the densely treed cross-country portions. There are approximately 100 trees located within the existing ditch alignment that would likely need to be removed for the Combined Alternative and approximately 175 more trees that would need to be removed for the cross-country sections of the alignment. The pipeline alignment in Blair Road would be within the road as much as possible but may require approximately 20 trees to be removed in narrow areas. A total of approximately 295 trees are anticipated to be removed for this alternative. Actual trees to be removed would be determined during final design, based on proximity to pipe, construction access, and hazard trees.

Pipeline Grading and Compaction

The pipeline grading and compaction for the Combined Alternative would be similar to the proposed Project along the 4,600 feet in the existing ditch. Excavation would be needed for the 3,200 feet along Blair Road and grading along with excavation would be needed for the 4,100 feet through cross-country terrain. Access would be limited for the cross-country portion of this alternative.
Combined Alternative Overview

Project Location
El Dorado Irrigation District
Upper Main Ditch Piping Project

Stantec

Figure No. 2.7-4
UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018

Appurtenances

Under the Combined Alternative, the appurtenances described in the proposed Project would still be necessary, however additional blow valves and air release/vacuum valves would be required. Isolation valves, air/vacuum release valves, blow-off valves, and manways would still be required under the Combined Alternative. The air release/vacuum valves would be located at the high points along the pipeline, while the blow-off valves would be located at low points along the pipeline to facilitate draining. This alternative would require additional blow-off valves at the low points under drainage crossings. Sediment may tend to deposit at these low points which would require periodic flushing. Additionally, isolation/flow control valves would still be needed at Reservoir 1 WTP and the Forebay Reservoir to accurately regulate the flows to the desired flow rate.

Connecting Pipeline at Forebay Reservoir Valve House

Under the Combined Alternative there would still be the need for a connecting pipe at the Forebay Reservoir Valve House. No additional changes would be made to the construction or location of this connection from the proposed Project versus the Combined Alternative.

Inlet Structure at Reservoir 1 WTP

The Combined Alternative would still require an inlet structure at Reservoir 1 WTP. The inlet structure under this alternative would be the same as the proposed Project.

Stormwater Considerations

The stormwater considerations under the Combined Alternative would be similar to the proposed Project for the portions that will be piped within the Upper Main Ditch. The section of the Combined Alternative that would be installed in the existing ditch would be constructed in the same manner as the proposed Project and the transition between the constructed sections and non-constructed sections of ditch would include a graded slope to allow normal gravity flow of stormwater within the channel as under the current (No Project) conditions. The ditch would continue to have the capacity to passively receive and convey stormwater flows during storm events. For the portions of the Upper Main Ditch where the pipeline would not be constructed in the ditch alignment, the District would no longer use those portions of the ditch. As such, the District’s existing easements across private parcels to own and operate the unused portions of the ditch would revert to the underlying property owners. The District would take appropriate future maintenance actions within its pipeline easement rights to maintain the ditch as necessary to protect and maintain District facilities. For the portions of the Combined Alternative that would go through cross-country terrain, the pipeline would be placed underground, and the surface would be regraded with a two-percent cross slope over the pipe for maintenance purposes.

Combined Alternative Construction Activities

Construction Equipment

The construction equipment necessary for the Combined Alternative would be similar to the proposed Project and that described for the Blair Road Alternative.
Project Description
June 2018

Access Roads and Staging Areas

Similar to the proposed Project, access to the Combined Alternative site would be accomplished using established roads including, but not limited to, U.S. Highway 50, Sly Park Road, Pony Express Trail, Forebay Road, Blair Road, Gilmore Road, Patrick Lane, Pony Express Court, and Pinewood Lane, which are paved, all-weather roads suitable for the anticipated loads. Potential access routes and alternative access routes are described and shown in greater detail in Section 2.6.2.13 and on Figure 2.6-5. Additional off-road access may be needed for the cross-country portions of this alternative. This has the potential to cause damage to the surrounding area as heavy construction equipment would need to enter the area. All staging areas would be selected and developed by the Contractor within limits approved by the District, and by separate agreement developed with landowners.

Construction-related Traffic

Construction-related traffic under the Combined Alternative would be similar to the proposed Project and the Blair Road Alternative.

Potential Borrow Site

The potential borrow sites for the Combined Alternative would be the same as the proposed Project.

Construction Schedule

The construction time for the Combined Alternative would be slightly longer than the proposed Project due to a significant length of pipeline installation within Blair Road and additional length constructed over cross-country alignments. However, construction would be continuous and only one outage period would be needed to construct sections of pipeline in the ditch alignment. Pipe installation and backfill would still be the largest single activity and is estimated to occur over approximately 30 weeks (approximately 7-months). Construction progress would vary from 80-feet per day to 100-feet of pipe per day depending on site-specific conditions. Construction of the Combined Alternative would require similar steps as the proposed Project and the Blair Road Alternative and would include mobilization, clearing and grubbing work, placement of the pipeline, placement of tie-ins and other appurtenances, and a final testing stage with surfacing (paving) followed by cleanup of the construction site. The total construction timeline for the Combined Alternative would occur over approximately 13 months and the breakdown of the construction timeline would be as follows (Table 2.7-2):

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Approximate Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>1 Month</td>
</tr>
<tr>
<td>Clearing and Grubbing</td>
<td>1.5 Months</td>
</tr>
<tr>
<td>Placement of Pipeline in the Roadway</td>
<td>2 Months</td>
</tr>
<tr>
<td>Placement of the Pipeline in Cross-County Portions and within Existing Ditch</td>
<td>4.5 Months</td>
</tr>
<tr>
<td>Placement of Tie-Ins, Services, and Other Appurtenances</td>
<td>2 Months</td>
</tr>
</tbody>
</table>
UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018

<table>
<thead>
<tr>
<th>Final Testing, Surface Restoration, and Construction Closeout</th>
<th>2 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>13 Months</td>
</tr>
</tbody>
</table>

2.7.2.3 No Project Alternative

CEQA Guidelines Section 15126.6(e)(1) requires that the No Project Alternative be described and analyzed “to allow decision makers to compare the impacts of approving the project with the impacts of not approving the project.” The No Project Alternative analysis is required to discuss “the existing conditions at the time the notice of preparation is published . . . as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services” (Section 15126.6(e)(2)).

As directed by the CEQA Guidelines [Section 15126.6 (e)(3)(B)], when a project consists of a development project on identifiable property, the “no project” alternative is the circumstance under which the project does not proceed. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, the “no project” consequence should be discussed.

The No Project Alternative assumes that if selected, the proposed Project would not be implemented, and the Upper Main Ditch would remain operating under existing conditions and the District would not derive the benefits of the proposed Project in terms of improved water conservation, and water quality.

According to Section 15126.6(e) of CEQA Guidelines, discussion of the No Project Alternative must include a description of existing conditions and reasonably-foreseeable future conditions that would exist if the proposed Project was not approved. Under the No Project Alternative, the District would not approve or implement the proposed Project. None of the environmental impacts identified in Sections 3.1 through 3.14 would occur. Furthermore, implementation of the No Project Alternative would not meet any of the proposed Project objectives.
2.8 ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>advisory circular</td>
</tr>
<tr>
<td>Afa</td>
<td>acre-feet annually</td>
</tr>
<tr>
<td>Amsl</td>
<td>above mean sea level</td>
</tr>
<tr>
<td>A/VRV</td>
<td>air/vacuum release valves</td>
</tr>
<tr>
<td>BOV</td>
<td>Blow-off valve</td>
</tr>
<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
</tr>
<tr>
<td>CEQA</td>
<td>California Environmental Quality Act</td>
</tr>
<tr>
<td>Cfs</td>
<td>cubic feet per second</td>
</tr>
<tr>
<td>CVP</td>
<td>Central Valley Project</td>
</tr>
<tr>
<td>DIP</td>
<td>Ductile Iron Pipe</td>
</tr>
<tr>
<td>District</td>
<td>El Dorado Irrigation District</td>
</tr>
<tr>
<td>EIR</td>
<td>Environmental Impact Report</td>
</tr>
<tr>
<td>FERC</td>
<td>Federal Energy Regulatory Commission</td>
</tr>
<tr>
<td>Forebay</td>
<td>El Dorado Forebay Reservoir</td>
</tr>
<tr>
<td>HDPE</td>
<td>High-Density Polyethylene Pipe</td>
</tr>
<tr>
<td>ISO</td>
<td>independent system operator</td>
</tr>
<tr>
<td>Mgd</td>
<td>million gallons per day</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatt</td>
</tr>
<tr>
<td>NOP/IS</td>
<td>Notice of Preparation/Initial Study</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>operations and maintenance</td>
</tr>
<tr>
<td>PG&amp;E</td>
<td>Pacific Gas and Electric Company</td>
</tr>
<tr>
<td>PRC</td>
<td>Public Resources Code</td>
</tr>
<tr>
<td>Upper Main Ditch Piping Project or Project</td>
<td>Upper Main Ditch Piping Project</td>
</tr>
<tr>
<td>PVC</td>
<td>Polyvinyl Chloride</td>
</tr>
<tr>
<td>SB</td>
<td>Senate Bill</td>
</tr>
<tr>
<td>SCADA</td>
<td>supervisory control and data acquisition</td>
</tr>
<tr>
<td>State</td>
<td>State of California</td>
</tr>
<tr>
<td>SWRCB</td>
<td>State Water Resources Control Board</td>
</tr>
<tr>
<td>USFS</td>
<td>United States Forest Service</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>WTP</td>
<td>Water Treatment Plant</td>
</tr>
</tbody>
</table>

2.9 REFERENCES

UPPER MAIN DITCH PIPING PROJECT

Project Description
June 2018


