Council Study Session

April 1, 2019

Agenda Item	Ashland Canal Piping Project Alternatives	
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Item Type	Requested by Council ☒ Update ☐ Request for Direction ☐ Presentation ☐	

SUMMARY

Before the Council is a consolidated analysis of the Ashland Canal Piping Project alternatives from the last 14 months of work. Staff has also developed responses to several new questions from Council (see attachment 1) from the study session presentation on February 4, 2019. At that study session, staff presented Council with a project summary and summaries of the engineering and natural resources challenges, and public comments, all of which are available on the City's website. Staff has worked closely with a team of very capable engineers, surveyors, and technical experts to analyze the complexities of this project. Staff relied on the Ashland Canal Advisory Group (see attachment 2) to assist throughout the process.

Staff will review a short presentation (see attachment 3) of the project goals and location, review the current conditions, update council on community input and answers to previous council questions, go over the net present value (NPV) costs over a 60-year life cycle, and pros and cons for each of the following alternatives:

Alt 1	Replace the entire canal with all new 24" HDPE pipe	NPV cost: $3,472,529
Alt 2	Replace open sections of canal with new 24" and 30" HDPE pipe and line existing piped sections	NPV cost: $4,339,897
Alt 3	Replace open sections of canal with urethane under-liner and new concrete channel, line existing piped sections: canal remains open	NVP cost: $4,334,379
Alt 4	Aggressively maintain existing canal; phase concrete repairs over the top of existing concrete canal channel	NVP cost: $3,004,658

PROJECT GOAL

The goals of the canal piping project are to:

1) reduce the amount of contaminates that enter the City owned section of the canal, and
2) conserve a significant amount of water currently lost primarily through seepage.

By replacing 10,700 feet (approximately 2 miles) of the existing canal with a below ground pipe, additional water contamination will be removed, and water conservation and efficiency goals will be realized and a vital piece of water infrastructure that delivers an alternate raw water supply to the City's water treatment plant will be fully replaced.

CITY OF ASHLAND

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals:

Allocate resources to essential services: drinking water system

Continue to leverage resources to enhance value service: address climate change (tier 1), and water conservation (tier 3)

BACKGROUND AND ADDITIONAL INFORMATION

The City of Ashland places a priority on improving water quality and efficient water management. As identified in the City's adopted 2012 Comprehensive Water Master Plan, piping the front section of the Ashland Canal (approximately 10,700 lineal feet) from Starlite Place to Terrace Street is intended to meet the goal of improving water quality in Ashland Creek and overall water efficiency. In years when water supplies are limited, the Ashland Canal is used as a supplemental water source. The water is treated to drinking water standards at the City's Water Treatment Plant (WTP). Raw water in an open canal is vulnerable to contamination from a variety of sources. These contaminants reduce the water quality of Ashland Creek. Ashland Creek routinely exceeds the State's maximums for E. coli bacteria in the summer months. Additionally, open canals are susceptible to water losses through seepage and evaporation. Water losses in the Ashland Canal are approximately 23% (91% of the loss is from seepage and 9% from evaporation).

At the August 1, 2017 business meeting, Council authorized a DEQ Clean Water State Revolving Fund (CWSRF) loan of $1.3 million to complete the Ashland Canal Piping project. At the January 16, 2018, business meeting, staff received Council approval to award a professional services contract to Adkins Consulting Engineering, LLP ($192,257). In addition, staff entered into a contract with StingRay Communications ($31,000) to assist with strategic communications and public outreach, and with Siskiyou BioSurvey for a vegetation and tree assessment ($14,790). The Southern Oregon University assisted with a wildlife survey. To date, the preliminary engineering and miscellaneous project expenses total $238,047.

PROJECT BACKGROUND

The City owns and operates a gravity fed concrete lined canal constructed in the early 1900s, which was originally intended for irrigation purposes. The Ashland Canal receives water from the Talent Irrigation District (TID). This water originates at Hyatt and Howard Prairie Reservoirs. The City has a contract to receive up to 1,369 acre-feet of water from the TID. Currently, the City purchases this water from TID for $51.17 per acre foot ($0.20/1000 gallons) of water delivered to the City's point of delivery at Starlight Terrace. The cost of this water once pumped, treated and delivered to City residents is $0.40/1000 gallons. By comparison, the City also can use treated water from the Medford Water Commission through the City's TAP (Talent Ashland Phoenix) pipeline at a cost of $1.15/1000 gallons.

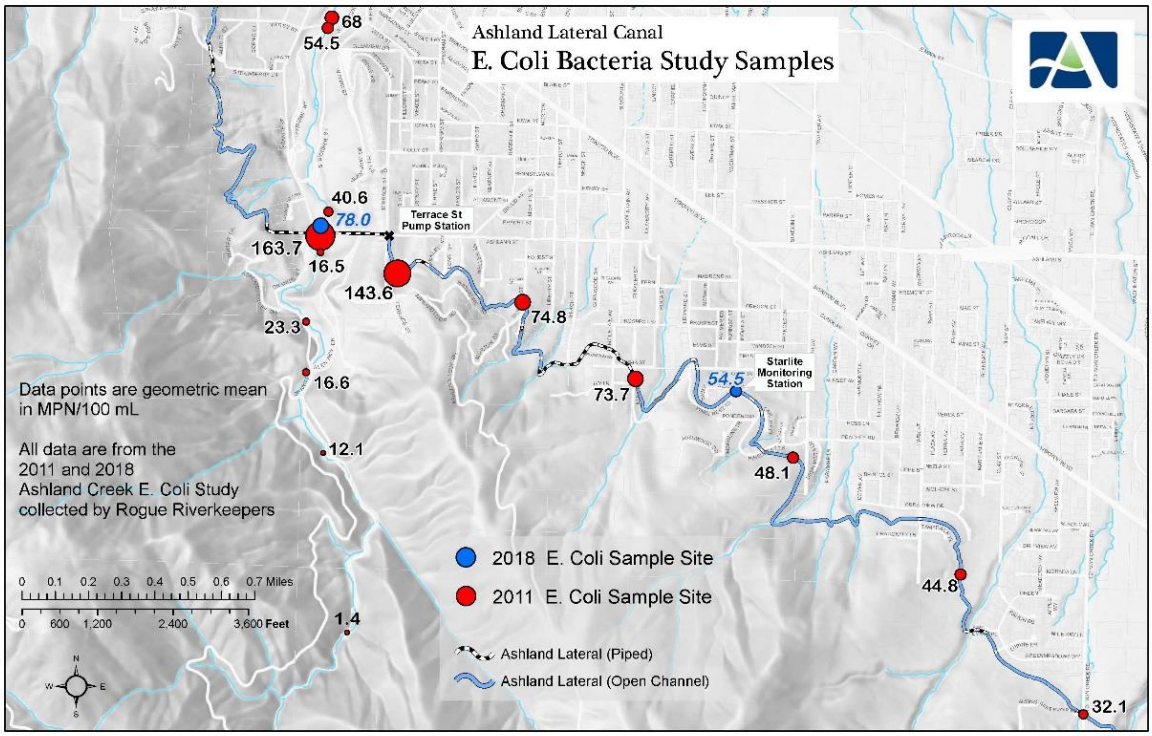
The City's section of the canal is located primarily within easements on private property. The majority of the easements describe a tract of land that is 10 feet on either side of the canal centerline for a total width of 20 feet. These easements allow for the construction, maintenance and operation of the canal across private property, and only grants the City access to the property. The City's canal section within the project area is approximately 2 miles in length beginning near Starlite Terrace and terminating at the wet well at the Terrace Street Pump Station. The existing concrete liner varies in condition from fair to poor with isolated sections of cracking mostly caused by tree roots or failing subgrade. Currently there are some sections of the canal that are piped under roads or driveways, they consist of several segments totaling 3,350 linear feet. In addition to the City's public utility easement, portions of the Ashland Canal also have recreational trail easements granted to the Ashland Parks and Recreation District from property owners. However, there are large sections of the Canal without trail easements.

The Canal is in operation seasonally from April through October in most years and is based on TID's water availability. When the Canal is in operation there is continuous flow into Ashland Creek from the Terrace Street Pump Station, which is necessary to account for the fluctuating canal flows into our wet well, as well as fluctuations in the demand for water from the irrigation customers along the canal.

It is a common misunderstanding that residents think they have "water rights" to the Canal water. The City and Southern Oregon University (SOU) have water rights, whereas, the residents who receive water from the Ashland Canal are purchasing the municipal irrigation water from the City, but do not have actual water rights. Being a municipal water right, the City can supplement the raw water supplied to the City's Water Treatment Plant with canal water to help offset the use of Reeder Reservoir (Ashland Creek water) and treated water purchased from Medford Water Commission though the Talent Ashland Phoenix (TAP) pipeline. All raw water is treated through the City's Water Treatment Plant. In recent years, Canal water has been pumped to the Treatment Plant in 2009, 2013, 2014, 2015 and 2018.

Raw water in an open canal is vulnerable to contamination from a variety of sources and reduces the water quality of local waterways. Additionally, open canals are susceptible to water losses through seepage, evaporation and transpiration by vegetation. Like many other local waterways, Ashland Creek routinely exceeds the State's maximums for E. coli bacteria in the summer months. The City regularly samples Ashland Creek for bacteria and posts public health notices along Ashland Creek when Oregon Health Standards are exceeded.

The Ashland Creek E. coli Bacteria Study (2011 Rogue Riverkeeper) shows that the Ashland Canal is a major contributor of E. coli into Ashland Creek. The Study also shows that E. coli concentrations increase from Tolman Creek Road to the Canal outfall into Ashland Creek. It is suggested that pet and/or animal waste adjacent to the Canal may be contributing to the higher than normal levels of bacteria in the Canal which is then conveyed to Ashland Creek. The graphic to the right is in the presentation and added here to illustrate the prior studies of E. coli through sections of the canal and in Ashland Creek.

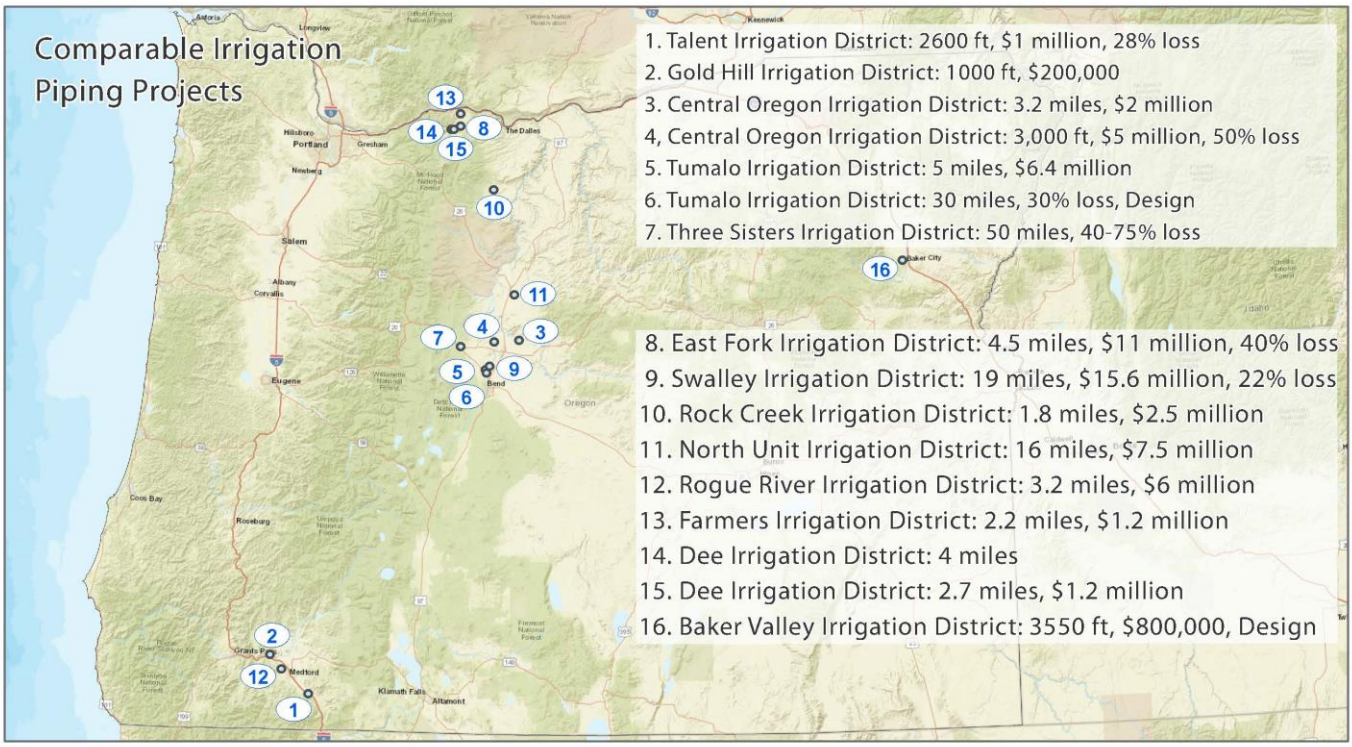


CITY OF ASHLAND

This project has produced a significant amount of research and information, all of which is available on the City web site (https://www.ashland.or.us/ashlandcanal). The detailed staff project summary was presented at the February 4th study session, and links are available to all reports on the engineering options, ecological analysis of the trees, wildlife impacts, ACAG meeting presentation and meeting summary notes, answers to frequently asked questions, the project map and current trail easements' locations.

Staff and Council have heard from many constituents that are not in favor of piping the canal. Reasons for not wanting to pipe the canal range from cost to potential tree loss within the easement to perceived loss in property values to the visual and aesthetic values of seeing water in the canal during irrigation season. Many just don't want to have the canal piped and there are many misconceptions, such as, that the trail will be turned into a "20-foot logging road" denuded of all vegetation – that is simply not the case; it will remain a trail.

Staff has been asked several times about other municipalities or agencies that are completing irrigation piping projects. The following graphic depicts locations in Oregon for piping projects.



The information provided with this report and in linked staff reports, as well as the pros and cons shown on the attached presentation attempt to quantify the concerns and present the information in the most objective manner possible. All of the alternatives presented are achievable, however, the only options that meets both of the project goals is to pipe the canal (alternatives 1 and 2).

Staff is eager to present this to council at the May 7th Council business meeting to obtain Council's decision to move forward on the selected alternative.

FISCAL IMPACTS

Due to the complexities of working in a very narrow maintenance easement area and anticipated additional expenses, the preliminary engineering cost estimate has grown from the original budget estimates of $1.3 to $1.8 million to pipe the canal. Current project estimates; design, permitting, and construction, have grown to a range between $2.4 to $3.9 million depending upon the selected alternative. This range identifies the cost differences for the four project alternatives including full pipe replacement, partial piping and partial pipe lining for the existing piped sections, or full canal lining and partial pipe lining for the existing piped sections, to an aggressive maintenance and concrete relining over time. The project costs have increased largely due to a very constricted easement area of only 20 feet in width along with tree removal and property protection. Costs will be refined during final engineering as the engineering team can get a better and more complete picture of the specific impacts for each property owner along the canal during the construction phase. The following summary defines the capital costs, annual operation and maintenance cost the projected life of each construction option, salvage value (remaining life at the end of 60 years) and the resulting net present value (NPV).

	Alternative #1	Alternative #2	Alternative #3	Alternative #4
Method	All new 24" pipeline	30" & 24" Pipeline	Replace Canal Liner	Aggressively Maintain
Pipe Material	Corrugated HDPE	Corrugated HDPE	Concrete & Urethane	Phased Repairs
Capital Costs	$3,095,000	$3,950,000	$2,429,000	$855,000
Annual O & M	$12,500	$12,500	$39,000	$75,000
Life of Option	60 - 100 years	60 - 100 years	40 - 60 years	20 - 25 years
Salvage Value	$354,280	$335,560	0	0
Net Present Value *	**$3,472,579**	**$4,339,897**	**$4,334,379**	**$3,004,658**

This project is 100% System Development Charges (SDC) eligible. The 2017-19 Biennium Water Fund Capital Improvement Project (CIP) budget includes SDC funds for contracted services in the amount of $1,452,000 for this project. Expenses for this project are intended to be reimbursed through a low interest (1%) Department of Environmental Quality (DEQ) Clean Water State Revolving Fund loan of $1.3 million authorized by Council at the August 1, 2017, business meeting. As noted above, the preliminary engineering and miscellaneous project expenses current total $238,047. Should Council move forward to final engineering (staff anticipates bringing this at the May 7, 2019 Council business meeting), staff will identify additional sources of funding for the selected alternative.

DISCUSSION QUESTIONS

Council is not being asked to make a decision tonight. This discussion is in preparation for a decision on which alternative to pursue at the business meeting on May 7, 2019. Staff anticipates Council discussions will likely surround the project cost and cost benefit, pros and cons of water quality and water conservation benefits, and the need to remove a significant number of trees regardless of the alternative selected.

As noted on the presentation, there are several common concerns with each of the alternatives, including:

- **Tree loss** within the existing canal in construction zones. Of the 287 trees originally identified to be at risk, less than 100 trees will need to be removed for construction. The exact number and location of those trees to be removed will be included on final engineering plans and will depend upon the selected alternative.

- The true impact to **property values** is unknown and although an understandable concern to each homeowner, is somewhat speculative.
- The ability to fully improve **public access** and trail connectivity throughout the canal sections is up to each property owner. If this is a desire, staff will require Parks Department assistance and coordination with property owners.
- The canal is of **historic value** and although it is not specifically listed on the historic register, there may be a way to adequately memorialize the canal to preserve its importance. These details will be determined through the permitting stages.
- **Klamath water rights** final adjudication is unknown for the basin as irrigation water rights challenges began in the basin in 1975 and litigation continues today. The Oregon Water Resources Department (ORWD) is fully engaged in determining water rights and annual allocations especially during drought conditions that are dependent upon rainfall, snow melt, and groundwater in the Klamath basin. Ashland receives TID water through a water right from the Bureau of Reclamation (BOR). This is not a simple solution and the City will rely on OWRD and the BOR to determine flows and allocations.
- The full impact to **wildlife** is unknown. Although this is not a "wildlife corridor," wildlife frequent the open canal during irrigation season. If the canal is piped, animals will need to find alternate water sources.

Staff and consult representatives will be available to discuss the project in detail and to discuss options available as Council moves toward a decision.

SUGGESTED NEXT STEPS

Staff anticipates bringing this item to Council for a decision to move to the next phase for final engineering on May 7, 2019. Staff is available and can schedule tours of the canal with Council members to better understand the concerns of community and existing conditions within the canal easements.

Once the preferred alternative is identified, final engineering will be completed with more detailed drawings, impacts and any additional right-of-way identified, and a final cost estimate will be prepared. Staff will identify additional revenue options prior to returning to council for approval on construction.

ATTACHMENTS

Attachment 1: Responses to Council Questions
Attachment 2: Ashland Canal Advisory Group Membership
Attachment 3: Ashland Canal Presentation

REFERENCES

1. February 4, 2019 Council Study Session staff report and minutes
2. 2012 Comprehensive Water Master Plan, Carollo (see page 7-7)
3. Atkins Engineering executive summary (Full reports available at www.ashland.or.us/ashlandcanal)
4. Siskiyou BioSurvey executive summary
5. SOU Letter (Wildlife)
6. ACAG presentation
7. ACAG meeting notes
8. FAQs
9. Project Map
10. Trail Easement Map

Ashland Canal Questions from Councilors and a couple others

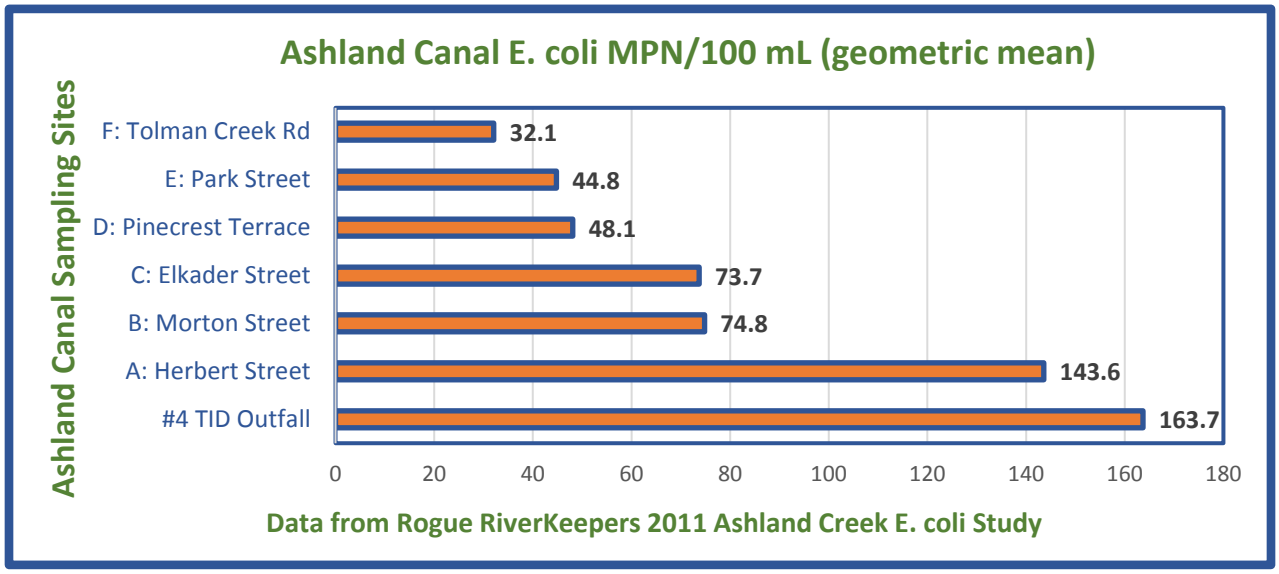
1. It looks like TID is still our preferred backup for drinking water over the Medford source (Talent Ashland Phoenix intertie TAP) because it is cheaper to buy raw water for our treatment facility than it is to buy treated water from Medford. Is that correct and what is the difference in cost? How much have we used for drinking water over the last five years or so?

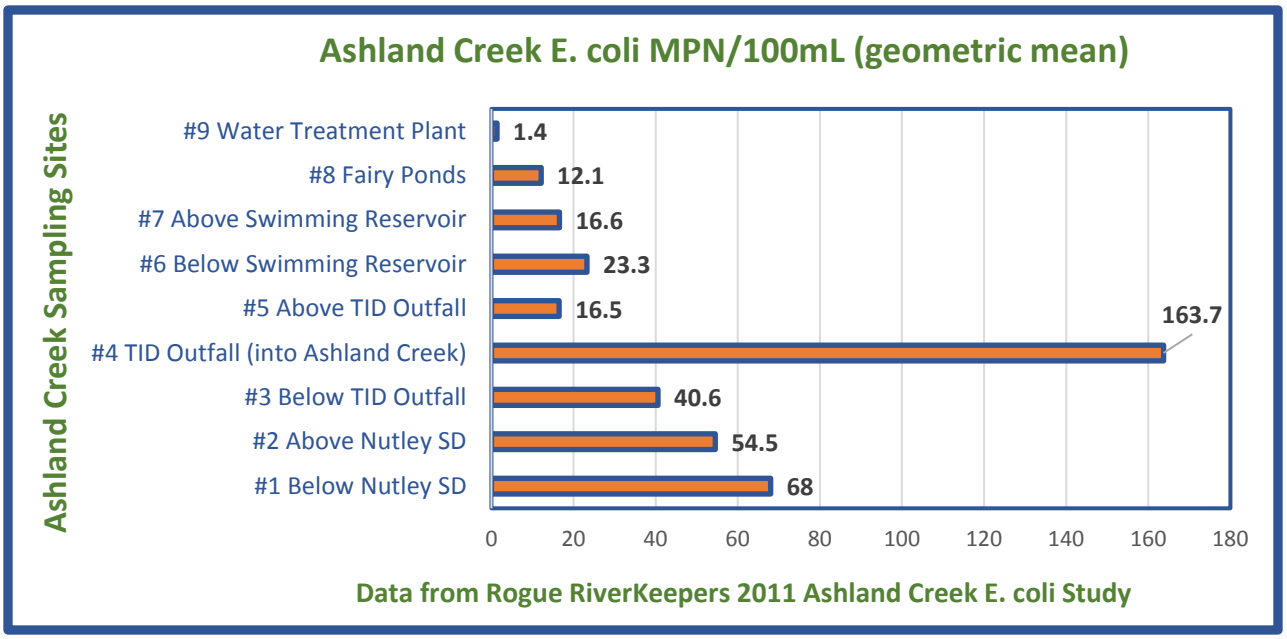
Yes, we supplement our drinking water first with TID water as allowed by the municipal uses of the TID and the much lower costs. We purchase TID water for $.20 per 1000 gallons, however when the pumping and treatment costs are added, the total TID water cost is $0.40 per 1000 gallons. Our costs for TAP water delivered into our system are $1.15 per 1000 gallons. Since 2009 we have pumped 457 million gallons of TID water and 176 million gallons of TAP. In addition, TAP is classified as an emergency water source. Our use of TAP at this point has only been for system evaluation and testing, not for emergency use. TAP is still considered an emergency source only.

2. Is temperature a problem at the Ashland Canal outfall in Ashland Creek? Are we collecting data to track that?
We are not aware of any temperature studies for the canal outfall. The Parks Department likely has some data from their E. coli sampling that includes temperature, but likely not collected for a temperature study for the Canal outfall.

3. Is there an E-coli threshold below which we are not experiencing a health hazard? Do we know what the baseline E-coli amount is in Ashland Creek before our canal water enters the natural stream? If our canal water did not pick up any more E-coli as it headed through town, would that be enough to keep us out of trouble in terms of health risks and signs telling people not to go in the water?

The state of Oregon health standard for E. coli in waterways is 406 MPN/100ml for single sample exceedance. The state considers waterways to be hazardous to public health when E. coli levels are above 406. Since 2013, the City has posted the swimming area of the playground in Lithia Park "unsafe to enter" 18 times. This swimming area is below the Ashland Canal outfall into Ashland Creek. The 2011 Ashland Creek E. coli Bacteria Study, available on our project website (www.ashland.or.us/ashlandcanal) goes into great detail regarding E. coli. In summary, the average E. coli concentrations in Ashland Creek just above the TID outfall are 16.5 MPN/100ml. The average E. coli concentrations just below the TID outfall are 40.6 MPN/100ml. The E. coli directly from the TID outfall averaged 163.7 MPN/100ml. While we can't control everything that enters into Ashland Creek, it's obvious that minimizing the E. coli that is contributed by the Canal will go a long way towards making Ashland Creek safe for the public.





4. It sounds like we do not meter existing Ashland customers who buy irrigation water from the City. Would this project allow us to meter those customers (plus the 800 new customers)? If so, is that cost figured into the estimate?

We do not meter the irrigation water purchased by our irrigation customers. Part of our design is to meter all connections for better accountability, and those costs are included in our estimates for the current connections. Future meters are not included as we don't know when those costs will be realized. Any future connection would be an added revenue source.

5. The memo says that it costs us around $75,000 per year to maintain it, yet more than half is in poor or fair condition. Have we been under-resourcing this work or are we at a place in the lifecycle of the canal where it's just not possible to hold it together with maintenance?

Our current Canal maintenance expenses are approximately $50,000 per year. We have been under resourcing this asset. We have been discussing piping the Ashland Canal since the adoption of the 2012 Water Master Plan. Due to the need for piping, our efforts have been focused on maintaining the canal as is and no major repairs have been scheduled. Most of the sections classified as poor/fair are in need of replacement. Every year that we do not complete the piping project or delay the construction has an incremental increase in the amount of deterioration.

6. I recall hearing a year or two ago about an update to the Water Master Plan, which I believe is the document that calls for this project. Is that plan in the process of being updated? If so, to what extent is it taking into consideration climate change and when do we expect it to be done?

The 2012 Water Master Plan originally identified the need to pipe the Ashland Canal. In 2013 Council approved the DEQ loan to complete the piping project. We are currently updating the Water Master Plan and anticipate it to be completed in June 2019. The canal piping project is a part of the new Master Plan project list. Climate change is not specifically discussed in the Water Master Plan but anticipated drought periods are planned. Piping the canal will protect the water from seeping and ensure full allocation of water is available for our residents.

7. There is a claim that maintaining the trail will create an effective fuel break, but that was put forward by the company that completed the ecological study. I would like to see an opinion from our fire department regarding the utility of this trail as a fire break - or as a means of accessing the area for firefighting in the event of a wildfire heading toward town. If it is to be used as a fire break, it will need to be maintained in a specific way. Is that part of the cost estimates for maintenance after the piping is installed?

We have received a memo from Ashland Fire and Rescue regarding this project and will forward to Council. We are planning on designing the trail so that it can be accessed by the Fire Departments' brush trucks in the event of a wildfire emergency in the area. The easement area will be maintained to allow for emergency fire and pipeline access.

8. It seems that Parks and Rec handles some amount of the dealing with the trail next to the canal. Is there any potential to work with landowners to develop easements that allow Parks and Rec to essentially manage this area as a lateral park/fuel break?

Possibly. While the Public Works Dept has not specifically asked land owners to grant additional trail access, we believe there are some opportunities for the Parks Dept and have worked with them through this process. The canal trail is listed as a priority in their planning documents. Additional trail easements need to be negotiated with the property owners that do not have specific public access easements.

9. I heard at the meeting last week that the canal is sometimes used to transport storm water. If that's the case, then climate change may require that we use the larger pipe assuming we pipe it. There was also talk about possibly doing bioswales to deal with that water. Has there been any consideration of building those bioswales into this project or would that be a separate project?

We would like to include bioswales in this project for minor amounts of storm flow, but our geotechnical report cautions against it due to soil conditions. This will be further evaluated if this project moves forward. Storm flows into the Canal were studied by our Engineers and they found the flows to be less than anticipated. This is primarily due to the fact that most of the Canal has roads upslope that redirect some of the storm flow into our storm system. This is discussed in the Preliminary Engineering Report, which can be found on our website at www.ashland.or.us/ashlandcanal.

9. Do we actually have to take out the liner? Given the access considerations and root problems, and potentially the need to create bio-swales, would it be possible/preferable to pipe, cover, and landscape the canal above ground while leaving the concrete liner and many of the trees in place?

There are several engineering/design reasons why we must remove the liner and excavate a small amount below the liner in order to pipe the Canal. Our elevations are fixed at the beginning and end of the project and it's very important that we maintain the same flow line and hydraulic characteristics we have now. Proper construction techniques require an appropriate amount of bedding/gravel to be placed below the new pipe, also requiring liner removal.

*10. In terms of the **cost**, I need to clarify a few things. It says that preliminary engineering costs have gone from 1.3 to 1.8 million. Then design, permitting, and construction has gone from 2.4 to 3.9 million. I assume these two categories are additive meaning that the total cost of the project (assuming we go with the preferred alternative costing 3.1 million) would be 4.9 million total. Is that correct or are the preliminary engineering numbers included in the estimate for design, permitting, and construction? Also, I am assuming that the 250k or so that has already been spent is included in the 1.8 million, but please correct me if I'm wrong.*

The $3.1 million estimate is to finish the design and construction of the Staff recommended piping alternative. Construction alone is $2.2 million. The $3.1 does not include costs to date ($250,000). That total is $3,350,000.

11. The message says that CIP funds are available for this, but it would help considerably to have a master CIP 20-year plan with information about how we intend to pay for these projects in hand prior to making this decision. It seems that this is heading our way later this spring, but I think we need it before this and the city hall questions get decided by the Council.

a. *There is concern in the community that CIP funds have been being stockpiled for specific projects and are now potentially going to be used for something different than what was originally intended.*

   Not true. Funds are set aside by enterprise and for specific projects.

b. *How would we likely fund this (the part not being funded by the CWSRF loan) - with a larger CWSRF loan, a bond, or our CIP budget?* Likely through a different loan agreement.

c. *Or are there other grant-based funding sources?*
   Yes, there are several opportunities well suited for this project.
   - Oregon Water Resources Department
   - Natural Resources Conservation Service
   - Oregon Watershed Enhancement Board
   - US Bureau of Reclamation

d. *It will be very hard to me to approve going forward with final engineering without at least a ballpark idea of what this will cost (including all aspects of the actual project and maintenance including the costs of repairing landscaping for homeowners) and our options for paying for it.*

   Estimates to finish the design and complete the construction are $3.35 million, costs for the restoration of neighboring properties are included.

12. I understand that the WISE project is no longer looking to pipe the rest of the irrigation canals in the valley. It seems this canal is an offshoot of the main canal and terminates in Ashland Creek. Please let me know if either of these understandings is wrong.

We are not aware of any significant changes to WISE, but are hearing that it is not on the front burner. Where to get the funding has been an obstacle for them. The Ashland Canal is fed by TID-BOR owned canals and terminates where we decide: the water treatment plant, Wright's Creek or Ashland Creek. In normal operation, our canal terminates into Wright's Creek, but there's always some spillage into Ashland Creek.

13. Do we have a legal risk of storm water - or a massive failure of the canal - flooding property owners along the canal? Is there a legal risk to the City for doing something that may decrease property values (I doubt this second one is the case, but people are talking about it so I just need to confirm).

Flooding and canal failure risks will be significantly reduced by this piping project. If the project moves forward, we will work closely with the City's legal team to address legal risks relating to property values. It is very difficult to quantify property value changes.

14. This may seem like a strange question, but do we know how many gallons of water we are conserving annually because of our ***water conservation program*** *and the actions residents are taking?*

Our city residents and water users have been very diligent with water conservation practices. Typical savings range between 2-4 million gallons per year. On average about 3 million gallons are conserved each year from the actions that residents are taking by participating in the water efficiency programs the City offers.

15. For the sections that are already piped, when was that piping done and what is the life expectancy of the pipe?

We don't have accurate construction records for the currently piped sections. Some are relatively newer and some are not. It's estimated that about 60% of the currently piped section have tar lined metal culverts and the rest are plastic pipe. The metal pipe is likely beyond its design life and it's known to corrode on the bottom and leak substantially. The plastic pipe appears to be in fair condition.

16. Will we be able to see the results of the questionnaire that was handed out to the participants at the meeting last week?

This information was provided to Council and is on the project webpage: Council Study Session Presentation. www.ashland.or.us/ashlandcanal

17. Can you tell me how many customers we currently serve with canal water, how much money that program brings in, and an estimate of how much water those current customers use?

This section of canal serves 99 properties and the backside of the Canal serves 86 properties. Total TID sales for FY 2018 were $64,846.23. Based on estimates from other landscapes of similar sizes, we estimate that properties are using anywhere from 30,000 - 70,000 gallons over a six-month period. It depends on how many square feet of landscaping is being watered and whether they are watering lawn, shrubs, trees or a mixture of all. This range of water use assumes at least 2,500 square feet of shrub and tree landscaping going up to 5,000 square feet of landscaping that incorporates a mixture of lawn, shrubs and trees.

18. It would also be helpful to know how many of the affected property owners are receiving irrigation water from the canal and which ones have a public use easement in place already? (In addition to the maintenance easement)

There are 19 properties within the project area that have irrigation service from the Canal. The map of the trail easements is on the project website (www.ashland.or.us/ashlandcanal). There are approximately 30 properties representing 56% of the total canal length in the project section that have trail easements in place now.

19. My thinking is that the community would like to have an unimpeded ***trail*** *along the canal whether it gets piped or lined and I'm wondering if there could be some packages created where we offer hook ups and/or some amount of irrigation water in exchange for public use easements in the areas where the City does not already have them. If we did that, people could decide to water some of the trees that are in danger of dying once the pipe is installed*.

Interesting policy question for council, additional public trail easements need to be negotiated with property owners.

20. I'm also wondering if it would be possible to get Parks and Rec involved in funding the acquisition of the public use easements. If there is a way to avoid some of the tree death by spending a bit more money on different installation techniques, Parks and Rec might be able to help with that if the end result is a continuous "canal" trail.

Parks would love to have this and be involved, additional public trail easements must be negotiated with individual property owners.

21. Lastly, you have probably already thought about this, but would it be possible to lay the new pipe above the current canal rather than digging out all of the concrete? Any chance we could build it up and mound over it with soil rather than digging down? Seems that might avoid the tree root problem and provide easier access for future repairs.

This was addressed in the engineering reports available on the project website (www.ashland.or.us/ashlandcanal) and with question #9 in this document. The new pipe has fixed points at the beginning and end of the project and is generally flat in elevation. It's very important that we maintain the current flow line and hydraulic characteristics of the current canal, the whole system is gravity fed and is a driving factor for engineering/design.

22. I'm not clear on what the 62,000,000 gallons of lost water refers to. Is this from the 2 miles proposed to be piped or the part of the canal operated by the city, or the total 17 miles of the Ashland canal? Can you clarify what this statistic refers to?

That is the estimated amount of water lost through seepage and evaporation in a typical irrigation season from the 2 miles of canal in the project area.

23. What is the current amount spent annually on maintenance of the project section of the canal? How much is spent on whole section operated by the city?

The City spends approximately $50,000 on annual maintenance for the whole canal. The City maintains this 2-mile section and the "back" side which is another 2 miles in length. These costs are for the whole Canal;

24. How many current customers receive irrigation water from the city section and how much does the city currently receive in payments form those who get irrigation water from the city? How many requests has the city received asking to start get irrigation water from the city?

This section of canal serves 99 properties and the backside of the Canal serves 86 properties. Total TID sales for FY 2018 were $64,846.23. On average we get about 5 requests a year for new TID service. The last time we installed a new connection was 2016, most of the time people are asking for it where it's not available or there isn't enough capacity or they determine the costs for installation are too high.

25. Has this section of the Ashland canal been maintained to the same level as the other approximately 130 miles of TID canal?

We don't have specifics on what the TID does regarding canal maintenance. However, our Water Distribution Staff have many responsibilities, the canal is a small portion of their responsibilities.

26. Why do the 27% of the project area canal in good condition need to be piped or redone?

Much of the current canal is showing signs of failure of some type and the liner is beyond its design life of 60 years. The areas considered "good" now are likely to degrade significantly in the near term. Also, leaving some sections open will allow for contaminates to enter the canal. It's important in design that we minimize the amount of piped connections, this also reduces construction costs. Excessive pipe connections of new to old sections brings up concerns of leaks and potential failure. The most robust solution with the lowest life cycle cost is replace all sections with new pipe.

27. Do you think the 20% factor is enough of a margin for the ditch project? The 24" diameter pipe has a cross sectional area which doesn't seem like a lot for high water events. The report addresses the area of the project but much happens at the southern, open stretches of the ditch that might not be addressed and may impact the area at the transition to the piping.

Yes. Water delivery from TID is limited by their canal and hydrology. Our design includes an overflow system at the beginning and mid-point of the piped section to mitigate potential storm surges.

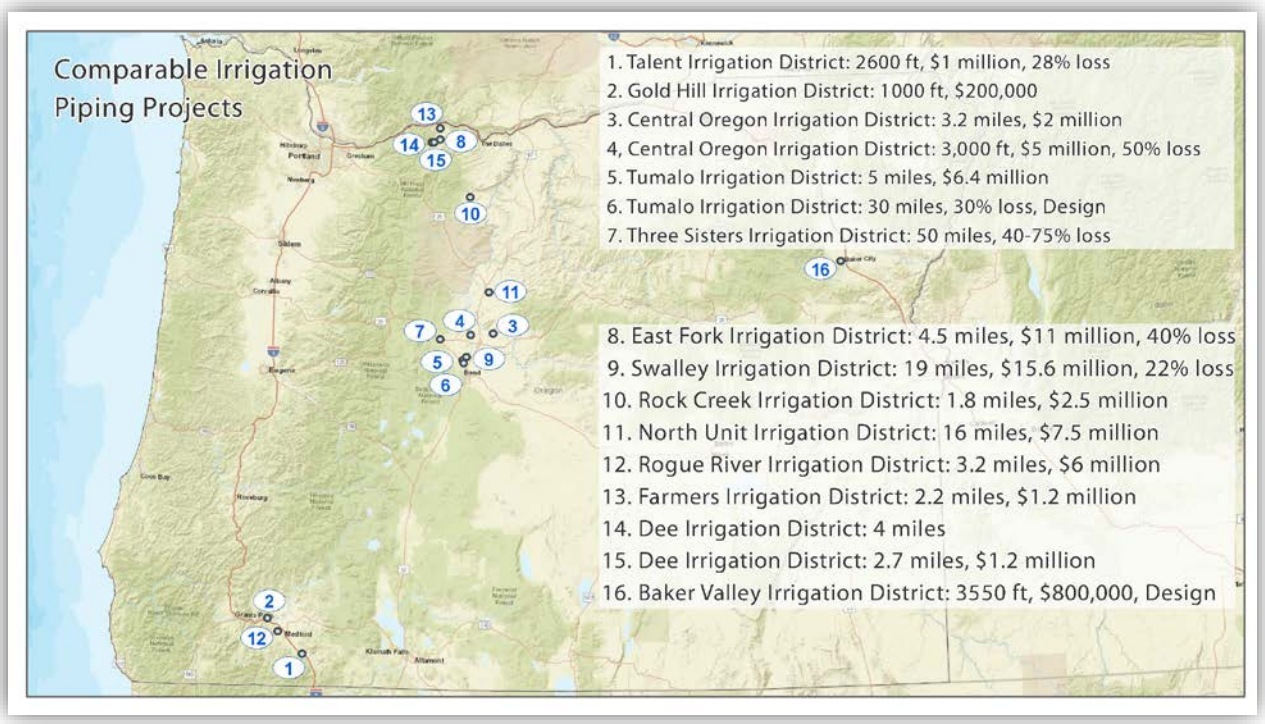
28. Over time, the ditch has come to serve storm run-off functions that may not be addressed by redirecting to the storm water collection system. I am curious if drainages like the Roca Canyon system can deal with the additional runoff.

These issues will be addressed during final design. The total storm flows are less than we realized, partly because much of the canal has a road network uphill that directs storm flows into our storm system already.

29. They are wondering whether the water rights adjudication process going on in the Klamath has any potential to affect our receipt of water in the future, particularly as it relates to native tribes in the region and their claims to water rights. Essentially, the question is should we invest significant amounts of money now when the adjudication process could eliminate the source of the water we would be transporting?

Klamath water rights final adjudication is unknown for the basin as irrigation water rights challenges began in the basin in 1975 and litigation continue today. The Oregon Water Resources Division (ORWD) is fully engaged in determining water rights and annual allocations especially during drought conditions that are dependent upon rainfall, snow melt, and groundwater in the Klamath basin. Ashland receives TID water through a water right from the Bureau of Reclamation (BOR). This is not a simple solution and the City will rely on OWRD and the BOR to determine flows and allocations.

30. They want to know if there are examples of other places where irrigation ditches have been piped. Given that TID hasn't piped their ditches yet, there seems to be some mistrust around the idea that other areas are moving toward piping rather than open topped canals.



31. There are people questioning whether the WISE project is still moving forward and whether piping is still what is wanted in the rest of the canal. From what I have heard, it still is the goal, but money is the issue. Is that correct and is there any way for the public to hear that message directly from the WISE program or TID - perhaps at the upcoming study session?

Yes, as far as we know, the WISE project it is still a goal however, securing funding for such a large project has been difficult. We have invited a WISE representative to the April 1st Study Session.

Ashland Canal Advisory Group (ACAG) Active Participants

Name	Organization	Email	Phone
Rich Miller	Homeowner & AWAC		
George Schoen	Homeowner Frontside		
Morgan Cottle	Homeowner Frontside		
Craig Harper	Homeowner Frontside		
Allen Bosma	Homeowner Frontside		
Steve Mason	WISE Project		
Roxanne Beigel	Conservation Commission		
Asa Cates	Tree Commission		
Dale Shostrom	Historic Commission		
David Chapman	Trails Association		
Rogue River Keepers	Stacey Detwiler		
	Robyn Janssen		

City Staff

Name	Organization	Email	Phone
Kevin Caldwell	Project Manager	Kevin.caldwell@ashland.or.us	541-552-2414
Julie Smitherman	Water Conservation	Julie.smitherman@ashland.or.us	541-552-2062
Mike Oxendine	Parks Superintendent	mike.oxendine@ashland.or.us	541-324-7876
Pete Baughman	Parks Arborist	baughmanp@ashland.or.us	541-951-2790
Chris Chambers	Ashland Fire	chamberc@ashland.or.us	541-552-2066
Jason Minica	Parks Trails	jason.minica@ashland.or.us	541-324-4112
Jeff McFarland	Parks Department (retired)		
Lea Richards	Ashland GIS	lea.richards@ashland.or.us	541-552-2418
Steve Walker	Water Distribution	steve.walker@ashland.or.us	541-552-2418

Consultants

Name	Position	Email	Phone
Dan Scalas	Proj. Manager	dscalas@adkinsengineering.com	541-884-4666
Brian Pisan	Engineer	bpisan@adkinsengineering.com	541-884-4666
Dan O'Connor	Surveyor	danoconnor@adkinsengineering.com	541-884-4666
Bill Galli	Geotech	bgalli@galligroup.com	541-955-1611
ShanRae Hawkins	Public Relations	shanrae@hellostingray.com	541-390-6411
SOU Biology	Michael Parker	Parker@sou.edu	541-552-6749
Siskiyou Bio Survey	Greg Carey	sunraymoonbeam@yahoo.com	541-821-1299
	Gretchen Vos	oregongretchen@yahoo.com	541-821-8648

Ashland Canal Advisory Group (ACAG) Invitation List 2.21.19

Commission	Contact	Email	Position
AWAC	John Williams		Chair
	Rich Miller		Commissioner
	Paula Brown	paula.brown@ashland.or.us	Staff Liaison
Tree	Mike Oxendine		Commissioner
	Peter Baughman		Parks Liaison
	Asa Cates		Commissioner
	Derek Severson	derek.severson@ashland.or.us	Staff Liaison
Historic	Terry Skibby		Vice Chair
	Dale Shostrom		Chair
	Bill Emery		Commissioner
	Fotini Kaufman	fotini.kaufman@ashland.or.us	Staff Liaison
Forest Lands	Stephen Jensen		Chair
	Chris Chambers	chamberc@ashland.or.us	Staff Liaison
	M. Matt	mattm@ashland.or.us	Park Liasion
Parks	Jeff McFarland	jeff.mcfarland@ashland.or.us	Parks Liaison
	Jason Minica	jason.minica@ashland.or.us	Parks Liaison
Trails	Torsten Heyche	torsten@ashlandtrails.org	Chair
	Rob Cain	Rob@ashlandtrails.org	Vice Chair
	Lea Richards	lea.richards@ashland.or.us	Staff Liaison
Conservation	Marni Koopman		Commissioner
	Roxane Beigel		Chair
	Adam Hanks	adam.hanks@ashland.or.us	Staff Liaison
WMC	Tim Bewley		Chair
	Alison Lerch	lercha@ashland.or.us	Staff Liaison
CEAP	Stu Green	stu.green@ashland.or.us	Staff Liaison
	Stefani Seffinger	stefani@council.ashland.or.us	Chair
SOU	Charles Lane		Hydrologist/Professor
	Eric Dittmer		Geology Professor
	Michael Parker		SOU Biology Professor
	Mike Oxendine		SOU Irrigation/Facilities
Homeowners	George Schoen		Homeowner
	Morgan Cottle		Homeowner
	Craig Harper		Homeowner / MWC
	Peter Bosma		Homeowner
Water Master	Shavon Haynes		Water Master
Wise Project	Steve Mason		Watershed & WISE
TID	Jim Pendleton		Manager
Forester	Marty Main		Forester
OSU Extension	Max Bennet		OSU Extention

Ashland Canal Piping Project

Council Study Session

April 1, 2019

City Council Study Session Expectations

- Recap of project goals, project location and E.coli data
- Condition of canal today; deferred maintenance concerns
- Community feedback and input
- Presentation of alternatives and pros and cons of each
  - Common concerns with all alternatives
  - Alt 1 Replace Entire Canal with New 24" HDPE Pipe
  - Alt 2 Replace Open Sections of Canal with New 24" and 30" HDPE Pipe and Line Existing Piped Sections
  - Alt 3 Replace Open Sections of Canal with Urethane Under-liner and new Concrete Channel, Line Existing Piped Sections; canal remains open
  - Alt 4 Aggressively Maintain Existing Canal; Phase Concrete Repairs over the Top of Existing Concrete Canal Channel; canal remains open

Note: Alternative #4 replaces the "do nothing" alternative as doing nothing is not truly feasible.

City Council Study Session Expectations - continued

- Cost comparisons
- Next steps
  - Council decision – May 7, 2019 (Council Business Meeting)
  - Final Design and Permitting
    - June 2019 – June 2020; depending on the selected alternative
  - Construction
    - start October 2020 depending upon the selected alternative

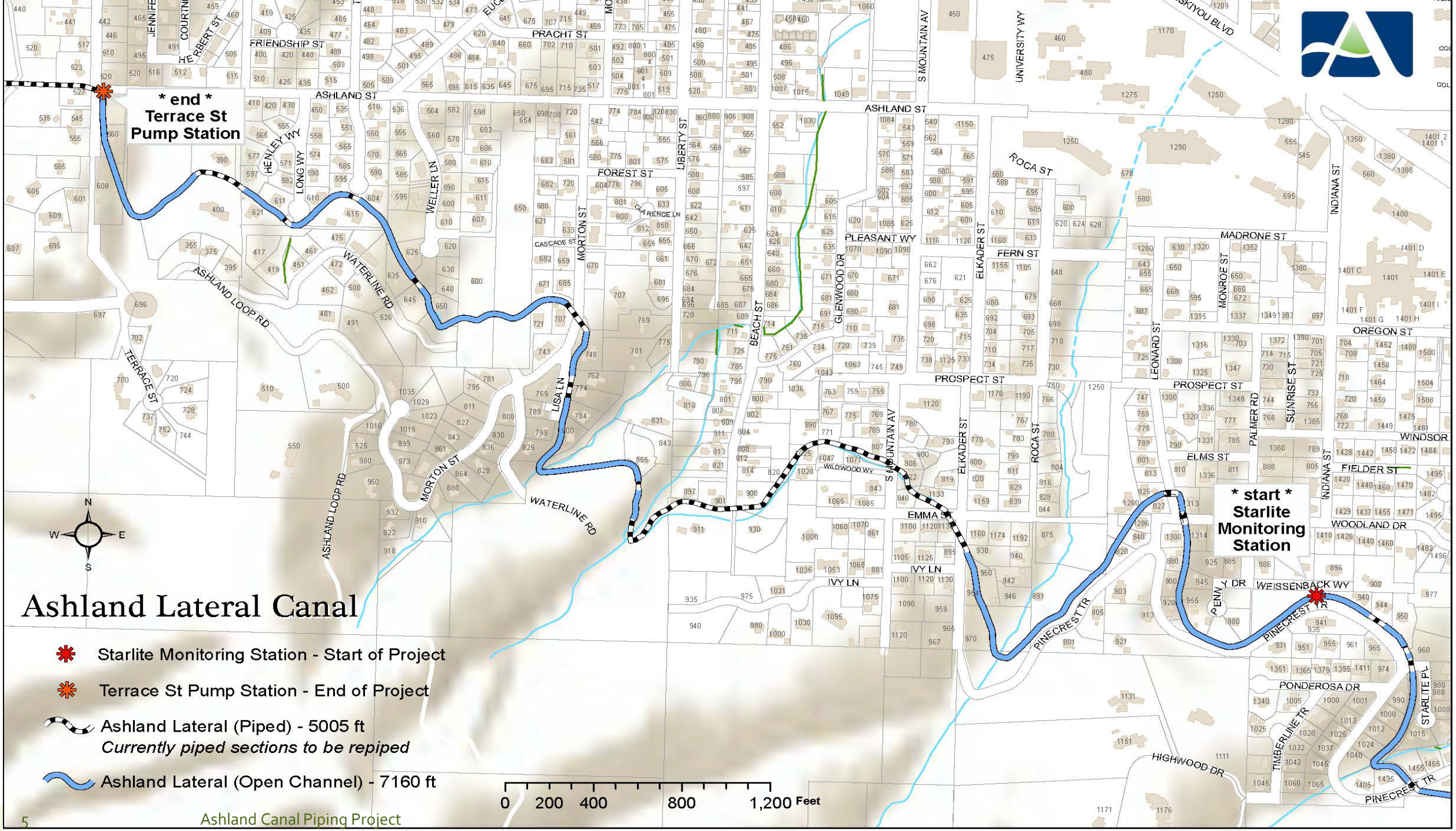
Project Purpose & Benefits

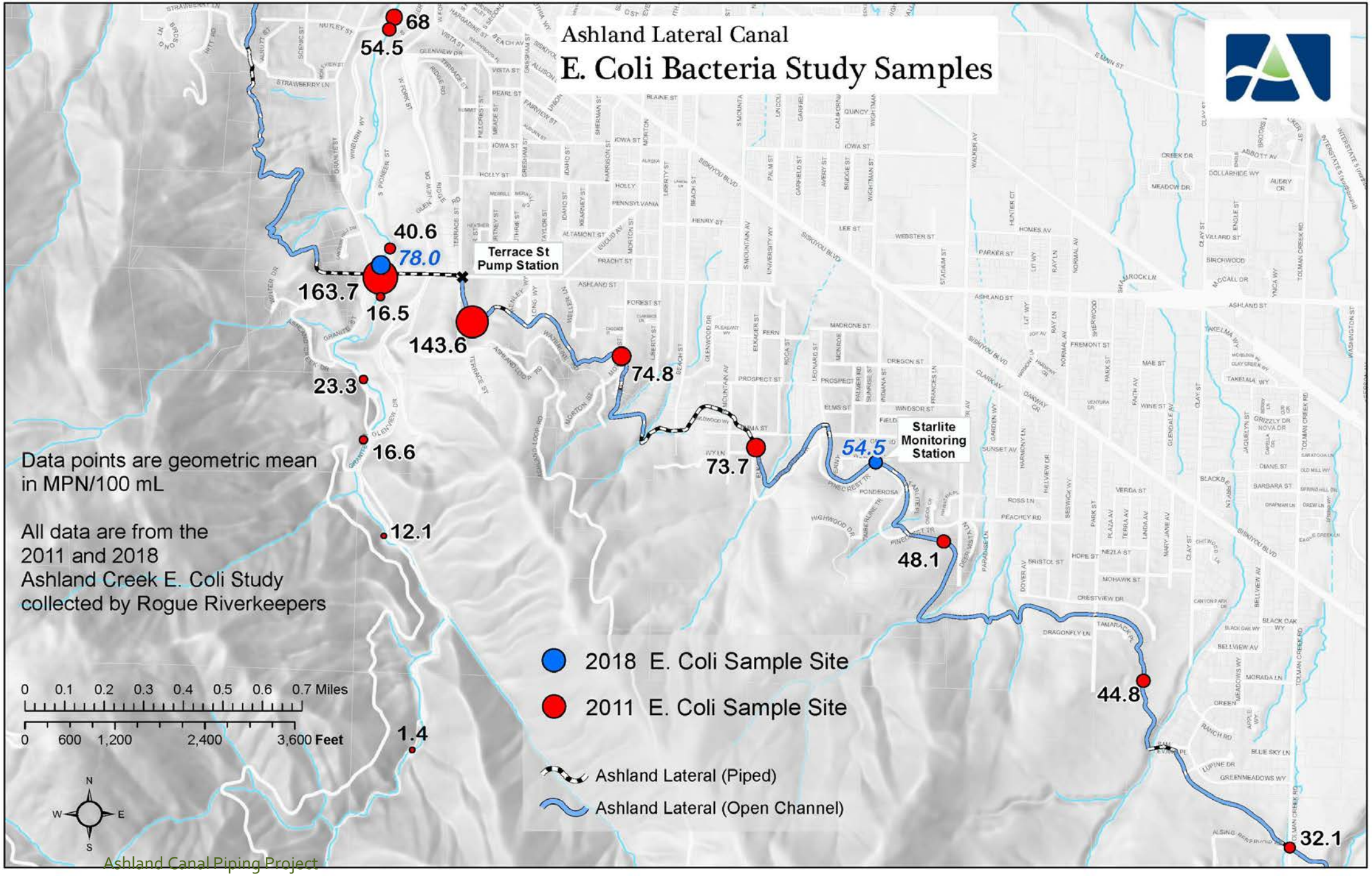
Purpose:

- Replace 10,700 feet of Ashland's open-channel seasonal irrigation canal from Starlite Place to Terrace Street with below-ground pipe to improve the water quality in Ashland Creek and to assist the City's goal for overall water conservation.
    - Recommended in the 2012 Water Master Plan

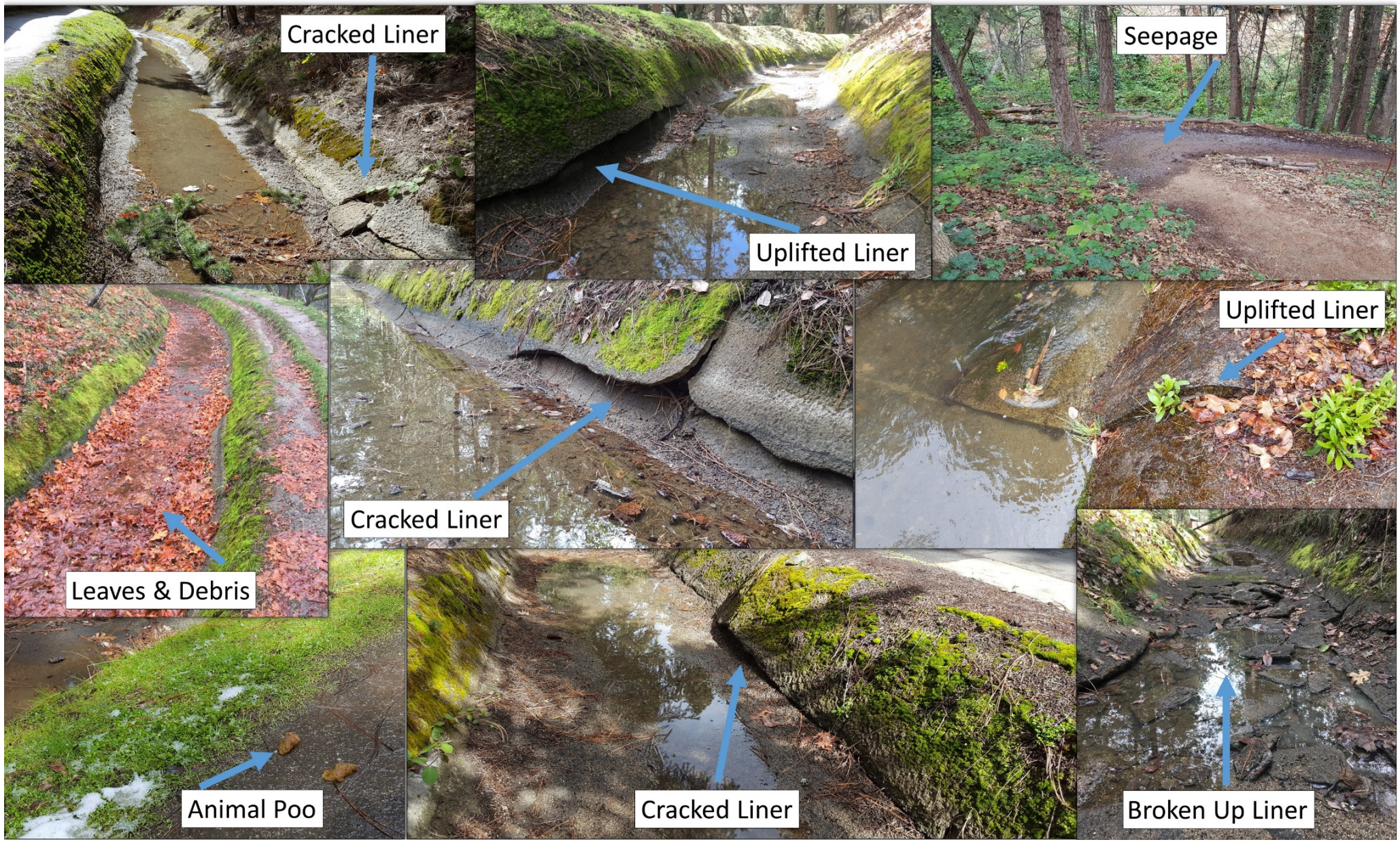
Benefits:

- Minimize water contaminants and health risks in Ashland Creek
- Conserve water and reduce water loss due to seepage and evaporation
- Maximize water resource – *Right Water Right Use*
- Protect drinking water sources

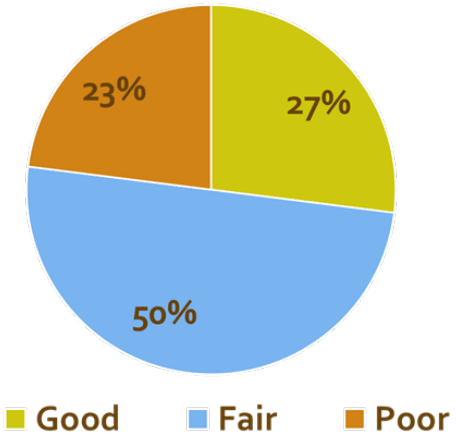

* end *
Terrace St
Pump Station
* start *
Starlite
Monitoring
Station
Ashland Lateral Canal
Starlite Monitoring Station - Start of Project
Terrace St Pump Station - End of Project
Ashland Lateral (Piped) - 5005 ft
Currently piped sections to be repiped
Ashland Lateral (Open Channel) - 7160 ft
0 200 400 800 1,200 Feet
N
S
E
W
ASHLAND ST
PRACHT ST
FRIENDSHIP ST
HERBERT ST
JENNIFER
COURTNEY
HENLEY WY
LONG WY
WELLER LN
FOREST ST
LIBERTY ST
CLARENCE LN
CASCADE ST
MORTON ST
WATERLINE RD
ASHLAND LOOP RD
TERRACE ST
LISA LN
BEACH ST
GLENWOOD DR
PLEASANT WY
S MOUNTAIN AV
UNIVERSITY WY
ROCA ST
ELKADER ST
FERN ST
MADRONE ST
MONROE ST
INDIANA ST
OREGON ST
LEONARD ST
PROSPECT ST
PALMER RD
SUNRISE ST
WINDSOR
ELMS ST
FIELDER ST
WOODLAND DR
WILDWOOD WY
EMMA ST
IVY LN
PINECREST TR
WEISSENBACK WY
PENNY DR
PONDEROSA DR
TIMBERLINE TR
HIGHWOOD DR
STARLITE PL


Ashland Lateral Canal
E. Coli Bacteria Study Samples
68
54.5
40.6
78.0
163.7
16.5
143.6
Terrace St
Pump Station
74.8
23.3
16.6
12.1
1.4
73.7
54.5
Starlite
Monitoring
Station
48.1
44.8
32.1
Data points are geometric mean in MPN/100 mL
All data are from the 2011 and 2018 Ashland Creek E. Coli Study collected by Rogue Riverkeepers
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 Miles
0 600 1,200 2,400 3,600 Feet
N
W
E
S
2018 E. Coli Sample Site
2011 E. Coli Sample Site
Ashland Lateral (Piped)
Ashland Lateral (Open Channel)

Ashland Canal Maintenance Issues



Current Concrete Liner Condition



Community Feedback & Input

- Impacts on trees & vegetation
- Aesthetics of water "feature"
- Not a community priority
- Impacts on wildlife
- Homeowner access during construction
- Disturbance and removal of homeowner bridges, fencing, rocks, driveways, etc.
- Water efficiency / quality
- Project costs
- Property Values
- Trail access
- Drainage
- Wildfire
- Privacy

Alternatives Assumptions

Alternative Criteria

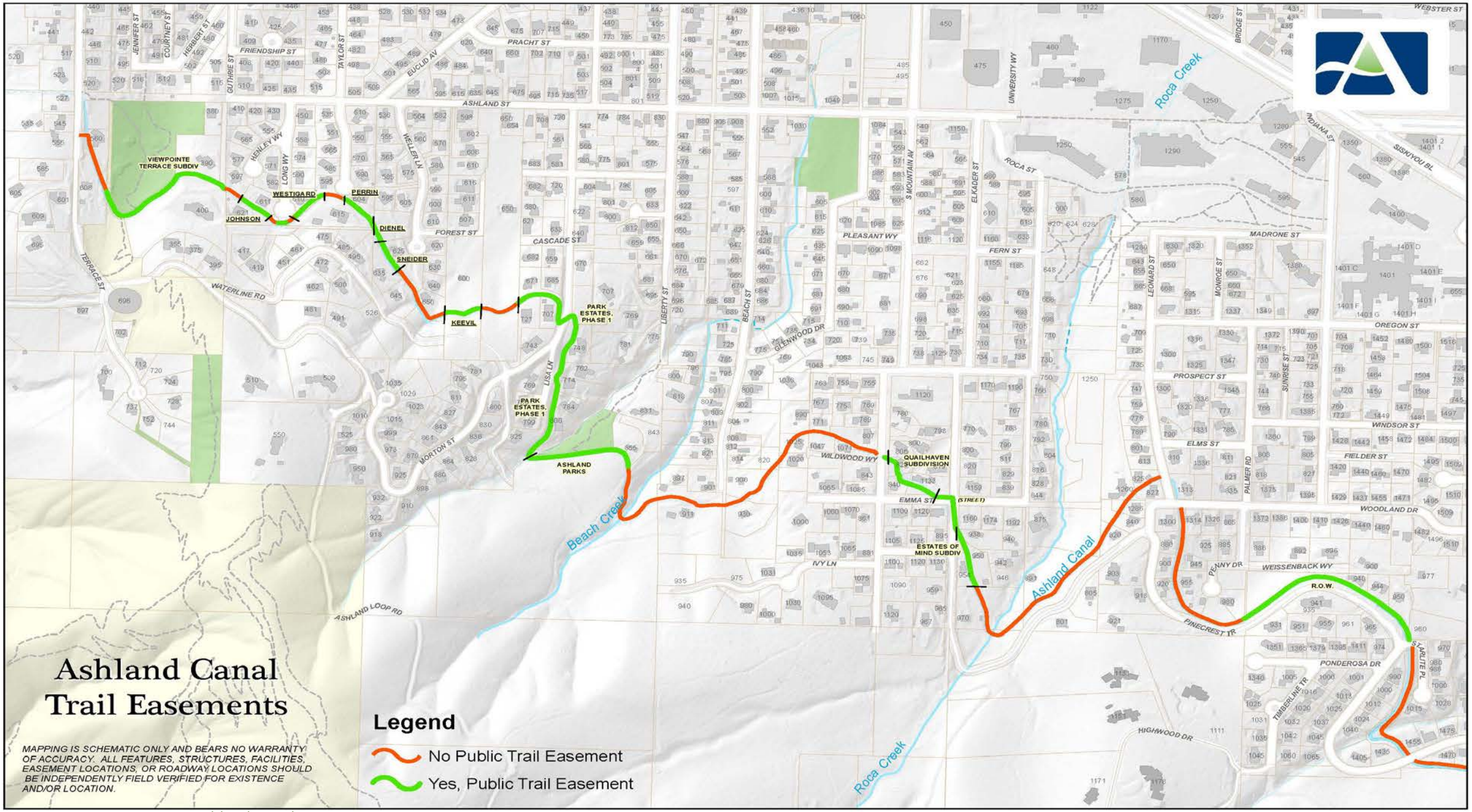
- Meet minimum design criteria of 7.2 cubic feet per second flow rate
- Ensure maximum upstream water elevation of 2,327.05 feet

Funding

- Alternatives 1-3 assume the City will apply for new grant funding and/or secure addition loan funding from the DEQ
- Potential grant funding sources:
  - Natural Resources Conservation Service
  - Oregon Watershed Enhancement Board
  - US Bureau of Reclamation
  - Oregon Water Resources Department
  - Rogue Basin Partnership

Alternatives Common Concerns

- Tree loss within the existing canal in construction zones
  - of the 287 trees identified in Siskiyou BioSurvey's report, **less than 100 trees** will need to be removed for any of the alternatives identified
  - the exact number and location of those trees to be removed will be included on final engineering plans
- Unknown true impact to property values; subjective at this time
- City has a maintenance easement for the canal throughout the canal section on all properties
- Of the 69 properties along the project area, $29^1/_2$ have dedicated public access easements; 39 do not
  - portions of the "trail" are not accessible
  - ability to fully improve trail connection throughout the canal section is unknown
  - requires Council and Parks prioritization and coordination with property owners


Ashland Canal
Trail Easements
MAPPING IS SCHEMATIC ONLY AND BEARS NO WARRANTY OF ACCURACY. ALL FEATURES, STRUCTURES, FACILITIES, EASEMENT LOCATIONS, OR ROADWAY LOCATIONS SHOULD BE INDEPENDENTLY FIELD VERIFIED FOR EXISTENCE AND/OR LOCATION.
Legend
No Public Trail Easement
Yes, Public Trail Easement
VIEWPOINTE TERRACE SUBDIV
WESTIGARD
PERRIN
JOHNSON
DIENEL
SNEIDER
KEEVIL
PARK ESTATES, PHASE 1
ASHLAND PARKS
QUAILHAVEN SUBDIVISION
ESTATES OF MIND SUBDIV
R.O.W.
Beach Creek
Roca Creek
Ashland Canal
ASHLAND ST
PRACHT ST
FRIENDSHIP ST
FOREST ST
CASCADE ST
WATERLINE RD
ASHLAND LOOP RD
PLEASANT WY
FERN ST
ROCA ST
MADRONE ST
OREGON ST
PROSPECT ST
WINDSOR ST
ELMS ST
FIELDER ST
WOODLAND DR
WEISSENBACK WY
PINECREST TR
PONDEROSA DR
HIGHWOOD DR
WILDWOOD WY
EMMA ST
IVY LN
GLENWOOD DR
WEBSTER ST
SISKIYOU BL
INDIANA ST

Alternatives Common Concerns - continued

- Historic significance
  - the canal system was constructed in the early 1900s
  - specific historic status of the canal is unknown; not on the historic register
  - will be determined through the permitting stages
- Klamath water rights adjudication is unknown for the basin
  - irrigation water rights challenges began in the basin in 1975 and continue today
- Wildlife impact
  - although this is not a "wildlife corridor", wildlife do frequent the seasonally open canal; if the canal is piped, wildlife must find alternate water sources

Presentation of Alternatives; pros and cons

- Alt 1 Replace Entire Canal with New 24" HDPE Pipe
- Alt 2 Replace Open Sections of Canal with New 24" and 30" HDPE Pipe and Line Existing Piped Sections
- Alt 3 Replace Open Sections of Canal with Urethane Under-liner and new Concrete Channel, Line Existing Piped Sections; canal remains open
- Alt 4 Aggressively Maintain Existing Canal; Phase Concrete Repairs over the Top of Existing Concrete Canal Channel; canal remains open

Net Present Value Calculation

- See Ashland Canal Piping project Preliminary Engineering Report, Adkins, page 7-4

NPV = C + USPW (O&M) –SPPW (S)

C = capital cost

USPW (O&M) = uniform series present worth of annual operation and maintenance cost

$$\text{USPW} = (\text{O\&M}) * \left[\frac{(1+i)^n - 1}{i * (1+i)^n} \right]$$

i = interest = 0.7%

n= #years = 60

SPPW (S) = single payment present worth of salvage value

$$\text{SPPW} = \text{salvage (future value)} * \left[\frac{1}{(1+i)^n} \right]$$

Alternative #1 - costs
Replace Entire Canal with New 24" HDPE Pipe

Estimated Initial Capital Cost:	**$3,095,000**
Estimated Life Cycle Cost (NPV) at 60 years:	**$3,472,579**

*NPV – net present value 2018 costs; Adkins p. 49

includes an anticipate salvage cost of pipe – indicating there is still "life" available in the pipe; HDPE life estimated at 100 years

annualized O&M costs $12,500

Alternative #1 – pros and cons

Replace Entire Canal with New 24" HDPE Pipe

Pros

- Maximizes water efficiency – 23% of water conserved
- Maximizes water quality by reducing new contaminates / E. coli from entering the canal
- Improved trail; potential for more connections
- Restores natural stormwater drainage
  - stormwater no longer travels in the canal
- Improved and metered irrigation connections
- Improvements in irrigation service
  - less sediment and debris in private lines
- Protection of a secondary potable water source
- Reduces chances of canal failure – all new pipe
- Removes seepage risk to foundation failure
- Safer environment for children and pets
- Minimizes water theft

Cons

- Loss of open seasonal waterway
- Loss of trees
  - likely the highest impact on trees (less than 100) as it is full replacement, including the existing piped sections
- Potential increase in trespassing
  - Without the canal to define the easement, trail users may wander on to private space
- Greatest impact to property owners during construction
  - entire section is replaced
  - this alternative has the most excavation
  - excavation is 1-2 feet below existing canal

Alternative #2 – costs

Replace Open Sections of Canal with New Pipe (30" and 24" HDPE) and Line Existing Piped Sections

Estimated Initial Capital Cost:	**$3,950,000**
Estimated Life Cycle Cost (NPV) at 60 years:	**$4,339,897**

*NPV – net present value 2018 costs; Adkins p. 49

includes an anticipate salvage cost of pipe – indicating there is still "life" available in the pipe; estimated life of HDPE 100 years, anticipate 60 years life for cured in place pipe liners

annualized O&M costs $12,500

Alternative #2 – pros and cons

Replace Open Sections of Canal with New Pipe (30" and 24" HDPE) and Line Existing Piped Sections

Pros

- Maximizes water efficiency – 23% of water conserved
- Maximizes water quality by reducing new contaminates / E. coli from entering the canal
- Improved trail; potential for more connections
- Restores natural stormwater drainage
  - stormwater no longer travels in the canal
- Improved and metered irrigation connections
- Improvements in irrigation service
  - less sediment and debris in private lines
- Protection of a secondary potable water source
- Reduces chances of canal failure – all new pipe
- Removes seepage risk to foundation failure
- Safer environment for children and pets
- Minimizes water theft

Cons

- Loss of open seasonal waterway
- Loss of trees (less than Alt #1)
- Potential increase in trespassing
  - without the canal to define the easement, trail users may wander
- Impacts to property owners during construction
- Transition of new/old can leak over time
  - must be actively monitored
- Highest capital cost
  - $4 million
  - two different pipe sizes required to maintain capacity and hydraulic head
- Highest life cycle cost
  - $4.3 million

Alternative #3 - costs

Replace Open Sections of Canal with Urethane Under-liner and new Concrete Channel, Line Existing Piped Sections: canal remains open

Estimated Initial Capital Cost:	**$2,429,000**
Estimated Life Cycle Cost (NPV) at 60 years:	**$4,334,379**

*NPV – net present value 2018 costs; Adkins p. 49

no salvage value

concrete life 40-60 years with urethane liner; anticipate 60 years life for cured in place pipe liners

annualized O&M costs $39,000

Alternative #3 – pros and cons

Replace Open Sections of Canal with Urethane Under-liner and new Concrete Channel, Line Existing Piped Sections: canal remains open

Pros

- Improves water efficiency – 21% of water conserved
- Retains visual and aesthetic value of open seasonal waterway
- Minimal impacts or changes to trail
  - No new trespassing concerns as the canal is visible
- Improved and metered irrigation connections
- Reduces chances of canal failure – new urethane liner
- Removes seepage risk to foundation failure
- Lower capital costs ($2.4 million)

Cons

- Canal is open to contaminates / E. coli intrusion
  - No additional protection to our secondary potable water source
- Water loss to evaporation/transpiration
- Loss of trees (potentially less than Alt #1 and 2)
- Stormwater drainage will still enter the canal
- Canal can flood/overflow, risk to private property
  - Debris and debris dam potential
- Transition of new/old can leak over time; must be actively monitored
- Impact to property owners during construction
- Does not reduce safety concerns for children or pets
- Does not reduce or eliminate water theft

Alternative #4 - costs

Aggressively Maintain Existing Canal, Phase Concrete Repairs over the Top of Existing Concrete Canal Channel; canal remains open

Estimated Initial Capital Cost: $855,000

Estimated Life Cycle Cost (NPV) at 60 years: $3,004,658

*NPV – net present value 2018 costs; Adkins revised

no salvage

essentially a huge patching job with concrete slurry placed over the existing concrete; no liner. Anticipated life 20-25 years.

annualized maintenance costs $45,000

Alternative #4 – pros and cons

Aggressively Maintain Existing Canal, Phase Concrete Repairs over the Top of Existing Concrete Canal Channel; canal remains open

Pros

- Minimal improvements to water efficiency
  - Concrete will continue to crack and seep
- Retains visual and aesthetic value of open seasonal waterway
- Minimal impacts or changes to trail
  - No new trespassing concerns as the canal and easement trail is visible
- Reduces chances of canal failure as sections are repaired
- Removes the seepage risk to foundation failure as sections are repaired
- Least immediate impact to property owners; impacts are more frequent
- Lowest number of trees removed immediately
- Lowest initial capital costs

Cons

- Canal is open to contaminates / E. coli intrusion
  - No additional protection to our secondary potable water source
- Loss of trees
- Water loss to seepage, evaporation, and transpiration
- Loss of volume / capacity with additional concrete layers in the canal
- Stormwater drainage will still enter the canal
- Canal can flood/overflow with risk to private property
  - Debris and debris dam potential
- Transition of new/old can leak over time; must be actively monitored
- Does not reduce safety concerns for children or pets
- Does not reduce or eliminate water theft
- Requires repairs each year; will have to replace some sections of existing concrete and likely line existing pipes

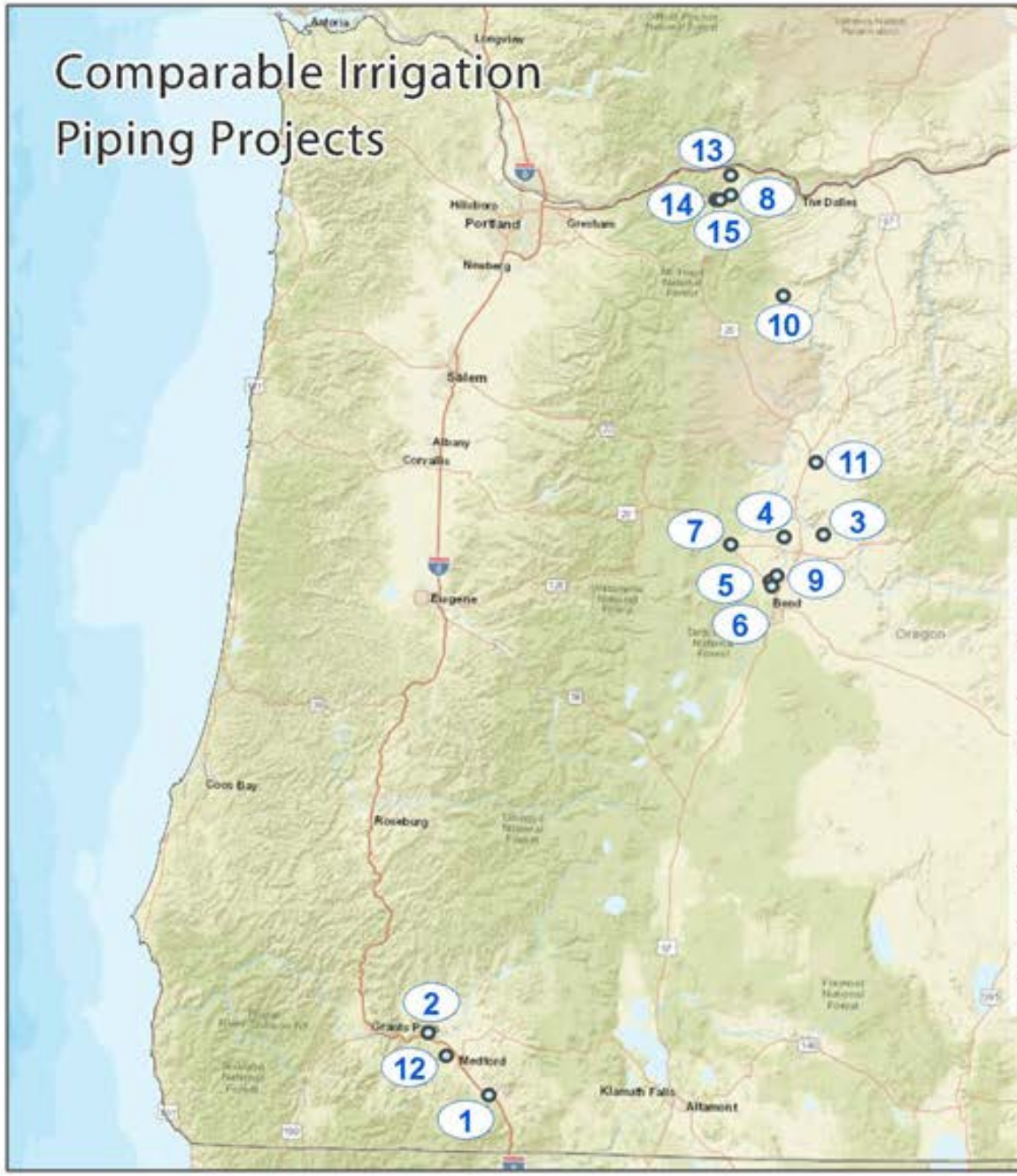
Alternative Comparisons

(2018 Costs)

	Alternative #1	Alternative #2	Alternative #3	Alternative #4
Method	All new 24" pipeline	30" & 24" Pipeline	Replace Canal Liner	Aggressively Maintain
Pipe Material	Corrugated HDPE	Corrugated HDPE	Concrete & Urethane	Phased Repairs
Capital Costs	$3,095,000	$3,950,000	$2,429,000	$855,000
Annualized O & M	$12,500	$12,500	$39,000	$45,000
Life of Option	60 - 100 years	60 - 100 years	40 - 60 years	20 - 25 years
Salvage Value	$354,280	$335,560	0	0
Net Present Value *	**$3,472,579**	**$4,339,897**	**$4,334,379**	**$3,004,658**

- Life Cycle Cost / Net Present Value from Adkins Final Report p. 49
- Net Present Value is based on a 60 year life cycle

Comparable Irrigation Piping Projects



1. Talent Irrigation District: 2600 ft, $1 million, 28% loss
2. Gold Hill Irrigation District: 1000 ft, $200,000
3. Central Oregon Irrigation District: 3.2 miles, $2 million
4, Central Oregon Irrigation District: 3,000 ft, $5 million, 50% loss
5. Tumalo Irrigation District: 5 miles, $6.4 million
6. Tumalo Irrigation District: 30 miles, 30% loss, Design
7. Three Sisters Irrigation District: 50 miles, 40-75% loss
8. East Fork Irrigation District: 4.5 miles, $11 million, 40% loss
9. Swalley Irrigation District: 19 miles, $15.6 million, 22% loss
10. Rock Creek Irrigation District: 1.8 miles, $2.5 million
11. North Unit Irrigation District: 16 miles, $7.5 million
12. Rogue River Irrigation District: 3.2 miles, $6 million
13. Farmers Irrigation District: 2.2 miles, $1.2 million
14. Dee Irrigation District: 4 miles
15. Dee Irrigation District: 2.7 miles, $1.2 million
16. Baker Valley Irrigation District: 3550 ft, $800,000, Design

Next Steps

Questions?

Concerns?

Interested in a canal tour?

Next Meeting – alternatives decision:

May 7, 2019

Council Business Meeting

More Information: www.ashland.or.us/ashlandcanal

CITY OF ASHLAND

Thank you!

"We do not see things the way they are, we see them the way we are."

-- Anais Nin