CITY OF ASHLAND

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

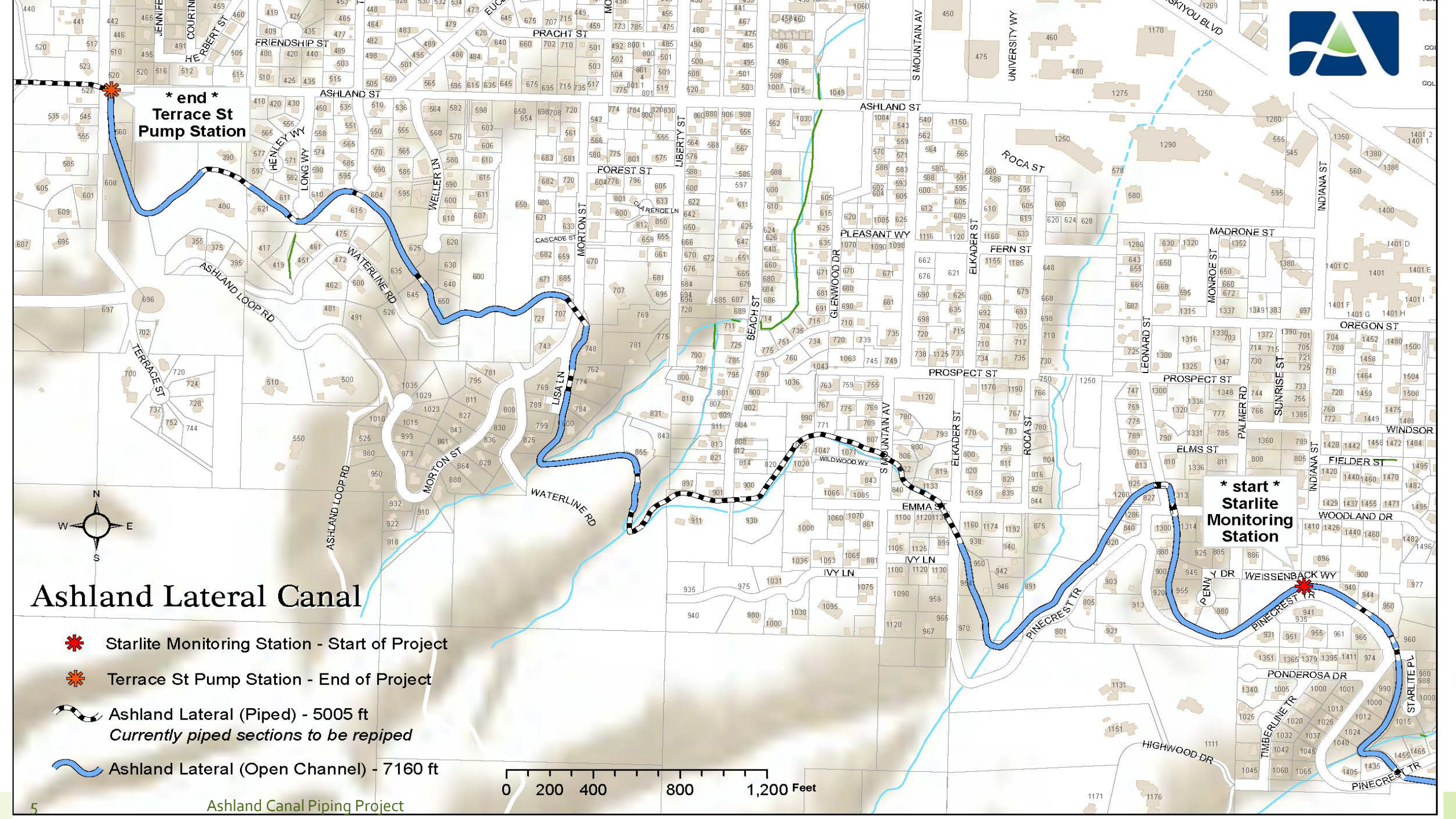
Project Purpose & Benefits

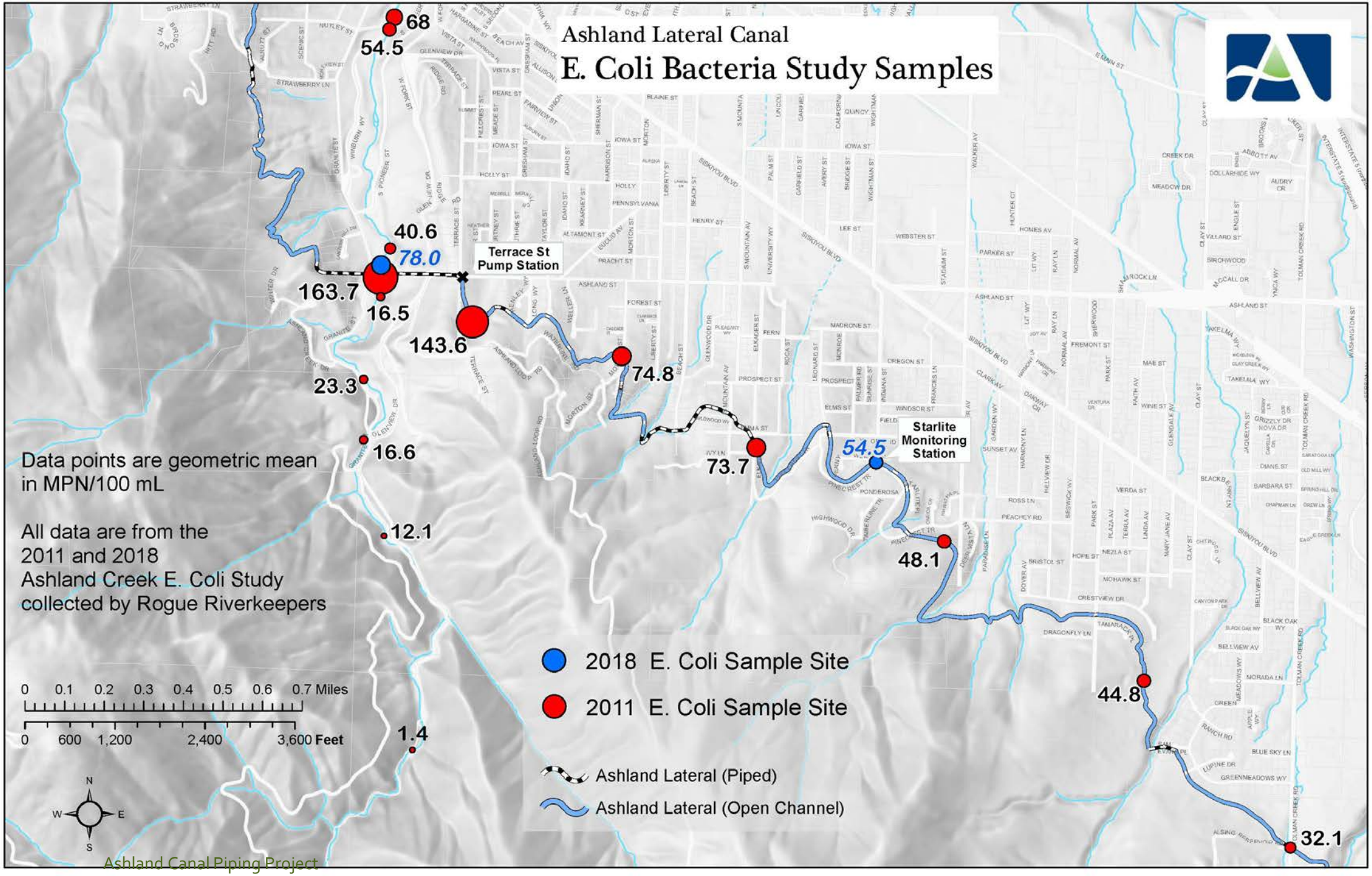
Purpose:

- 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

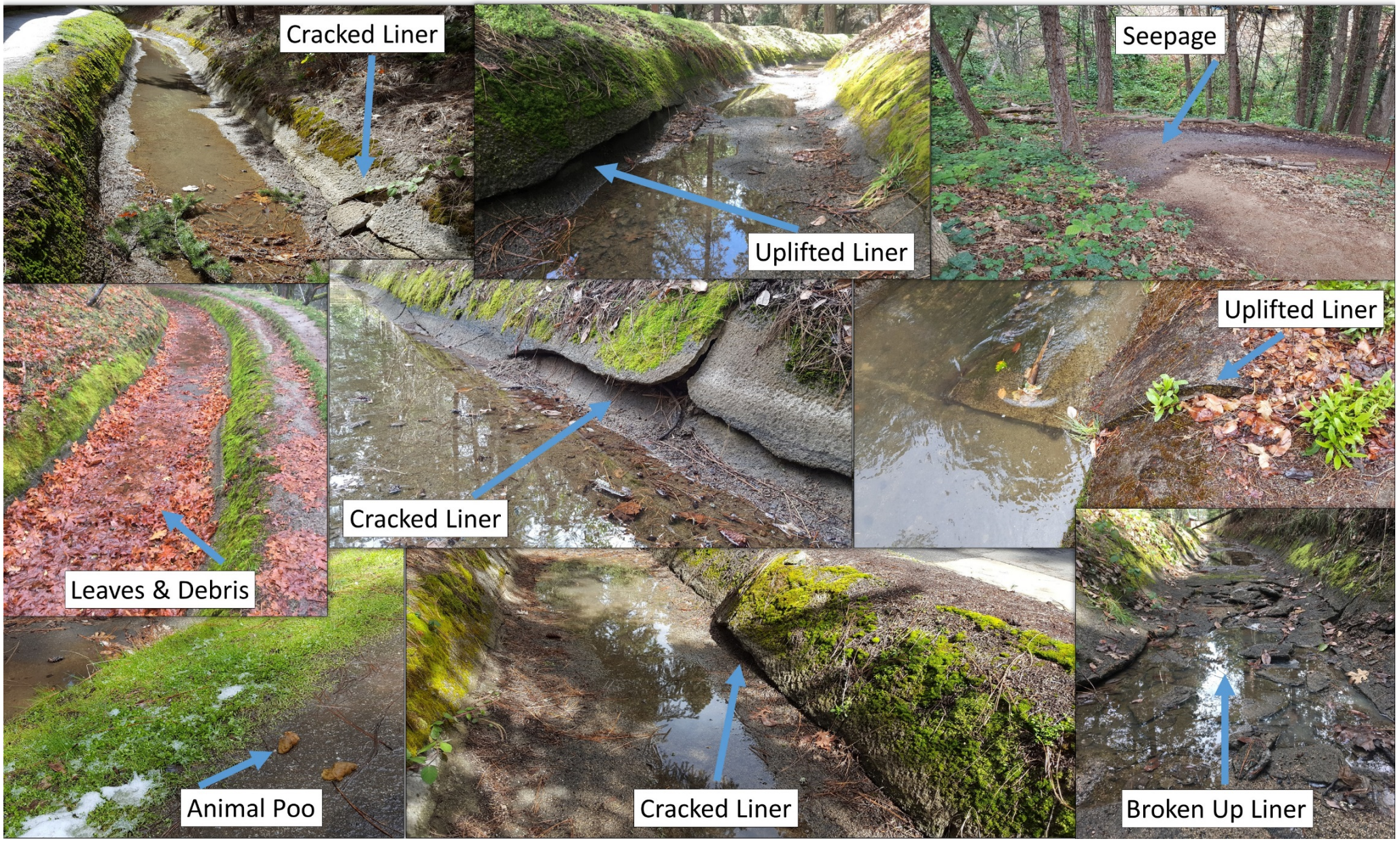
Benefits:

- 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

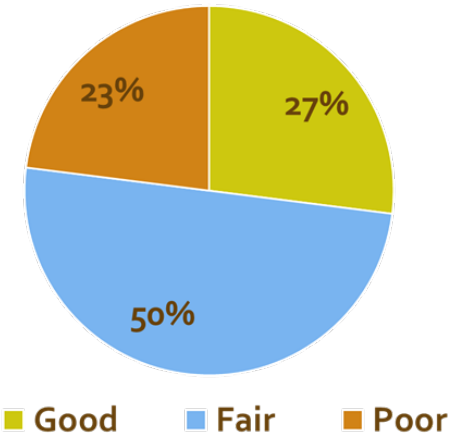

* end *
Terrace St
Pump Station
* start *
Starlite
Monitoring
Station
Ashland Lateral Canal
Starlite Monitoring Station - Start of Project
Terrace St Pump Station - End of Project
Ashland Lateral (Piped) - 5005 ft
Currently piped sections to be repiped
Ashland Lateral (Open Channel) - 7160 ft
0 200 400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


Ashland Lateral Canal
E. Coli Bacteria Study Samples
68
54.5
40.6
78.0
Terrace St
Pump Station
163.7
16.5
143.6
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

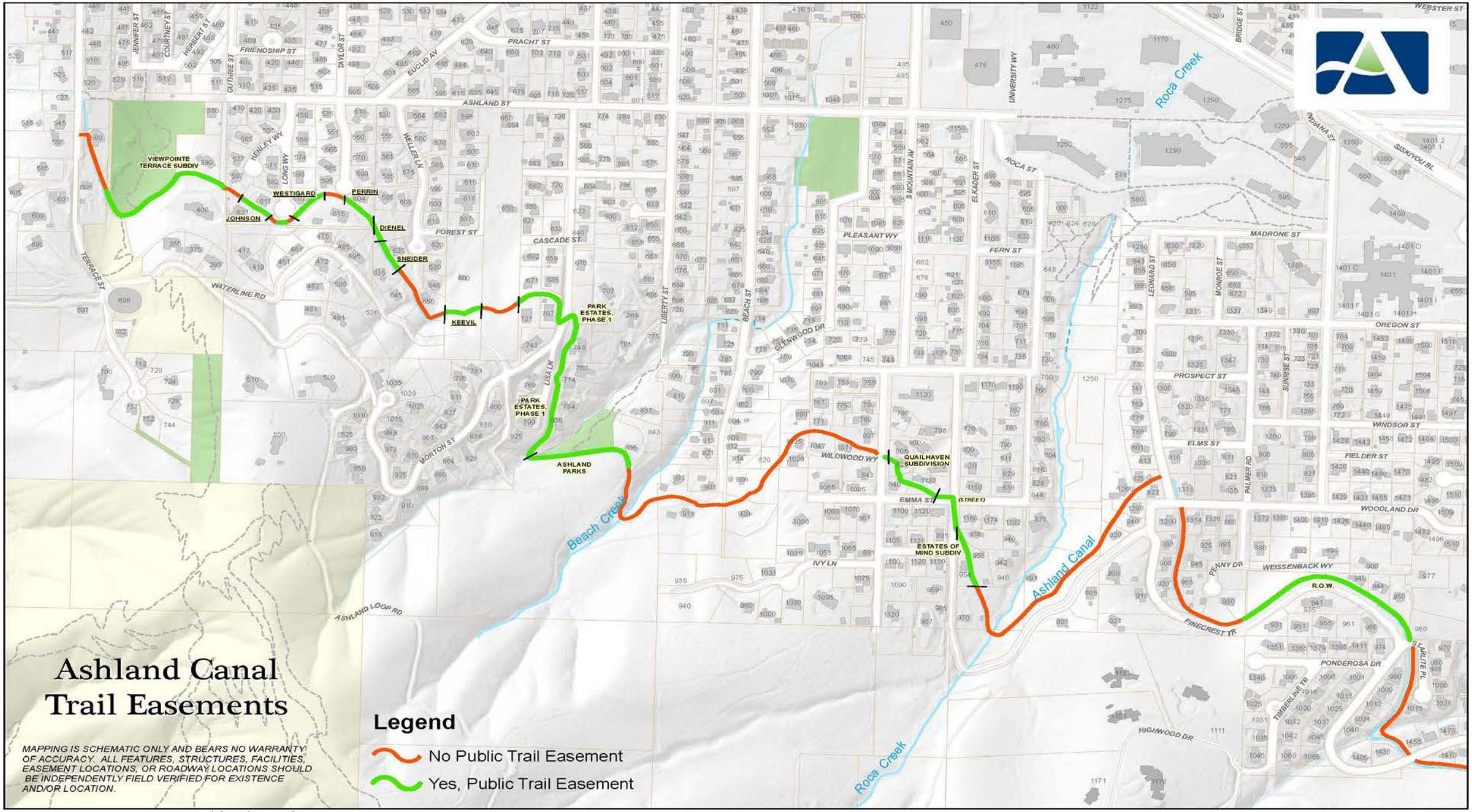
- Meet minimum design criteria of 7.2 cubic feet per second flow rate
- Ensure maximum upstream water elevation of 2,327.05 feet

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
PARK ESTATES, PHASE 1
ASHLAND PARKS
QUAILHAVEN SUBDIVISION
ESTATES OF MIND SUBDIV
R.O.W.
ASHLAND ST
PRACHT ST
FRIENDSHIP ST
FOREST ST
CASCADE ST
WATERLINE RD
ASHLAND LOOP RD
MORTON ST
WILDWOOD WY
EMMA ST
(STREET)
IVY LN
PLEASANT WY
GLENWOOD DR
ROCA ST
FERN ST
MADRONE ST
OREGON ST
PROSPECT ST
ELMS ST
WINDSOR ST
FIELDER ST
WOODLAND DR
WEISSENBACK WY
PINECREST TR
PONDEROSA DR
HIGHWOOD DR
TIMBERLINE TR
PENNY DR
Beach Creek
Roca Creek
Ashland Canal
Roca Creek

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

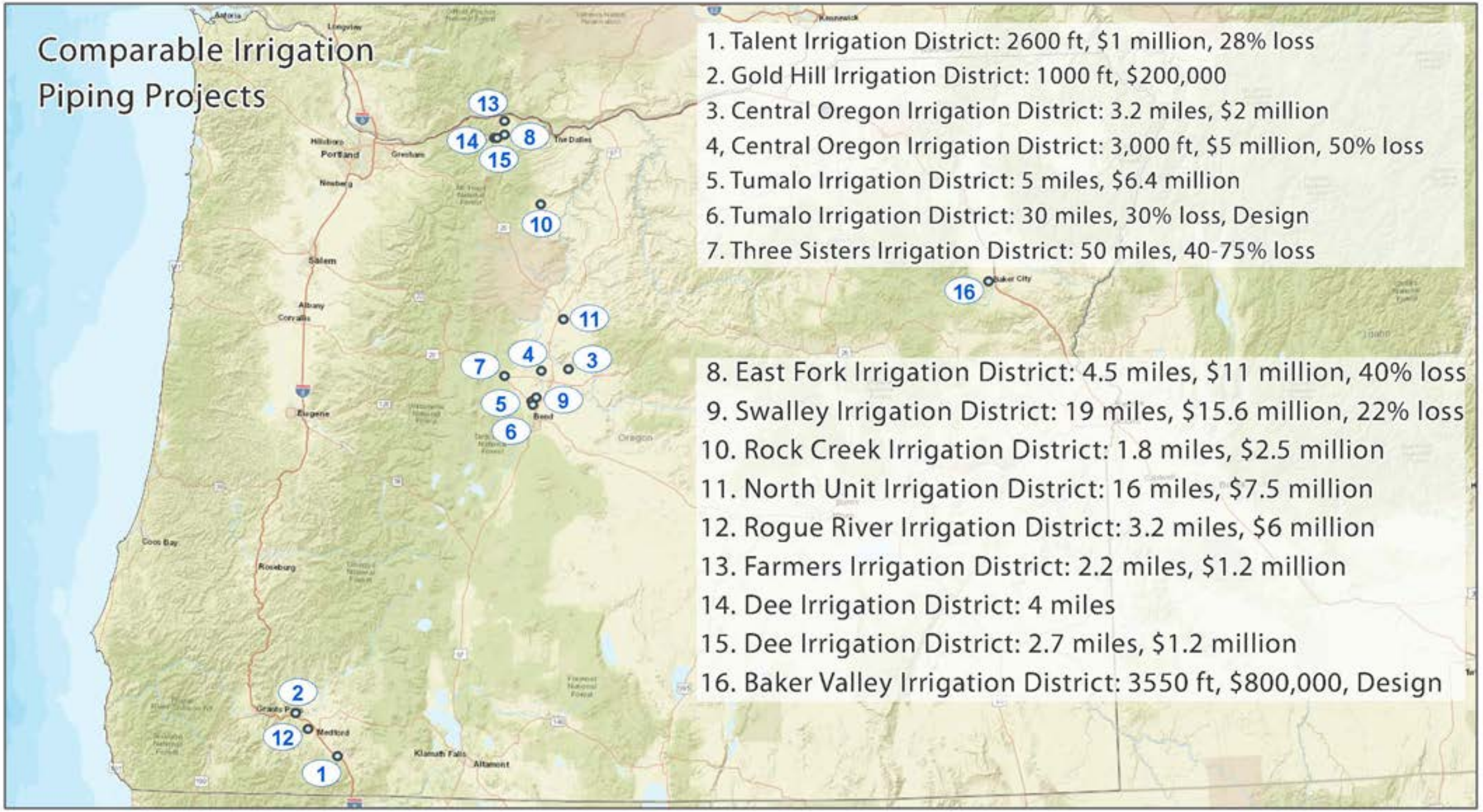
Alternative Comparisons

(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