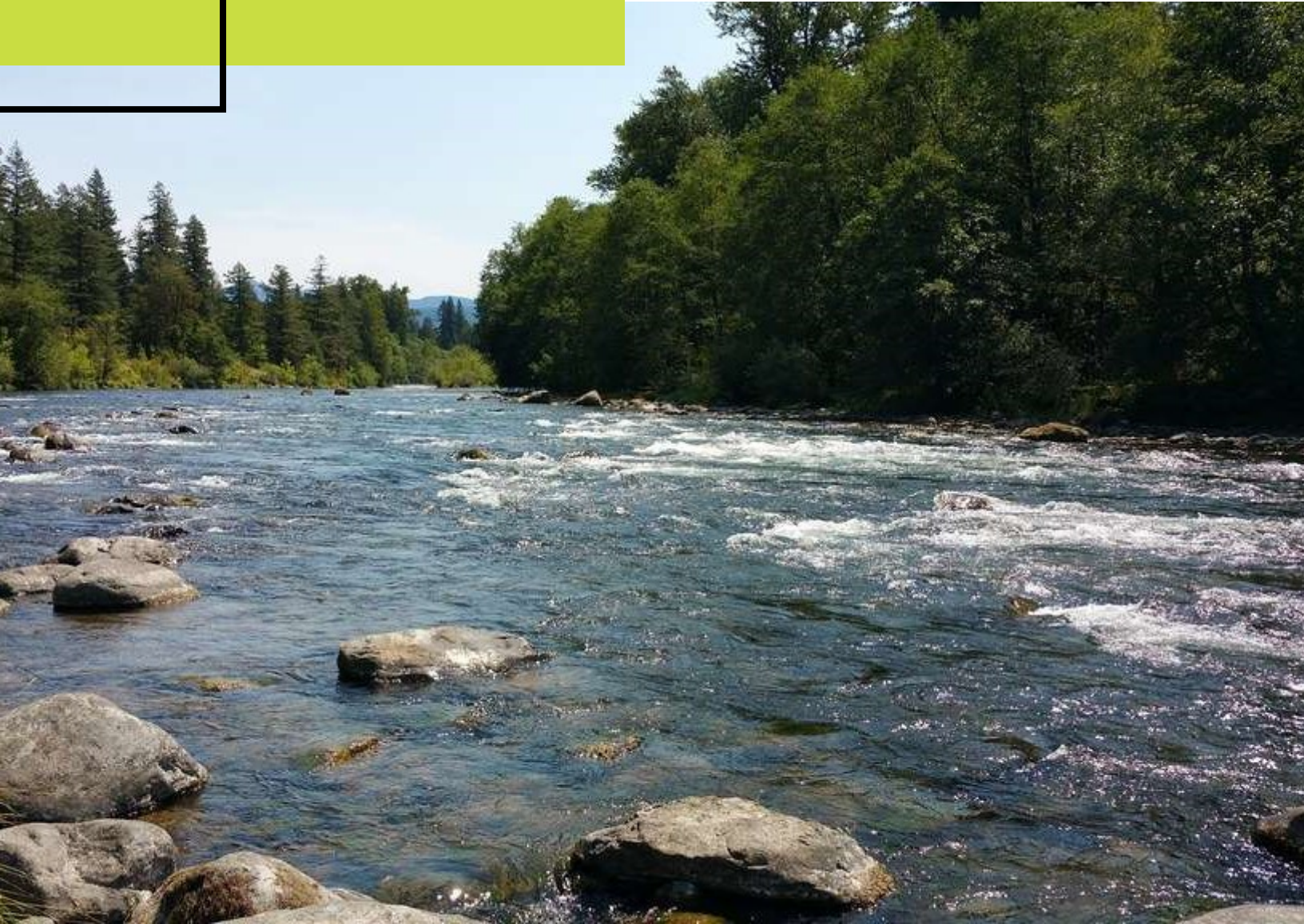


North Santiam Sewer Authority Wastewater Master Plan

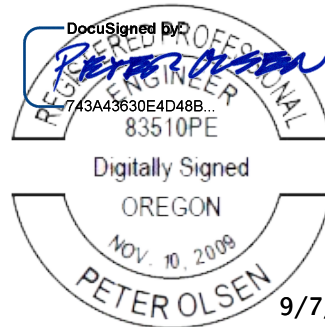
September 2021



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NORTH SANTIAM SEWER AUTHORITY

WASTEWATER MASTER PLAN



9/7/2021

EXPIRES: 12-31-2022

SEPTEMBER 2021

PROJECT NO. 219126

PREPARED BY:



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PREPARED FOR:



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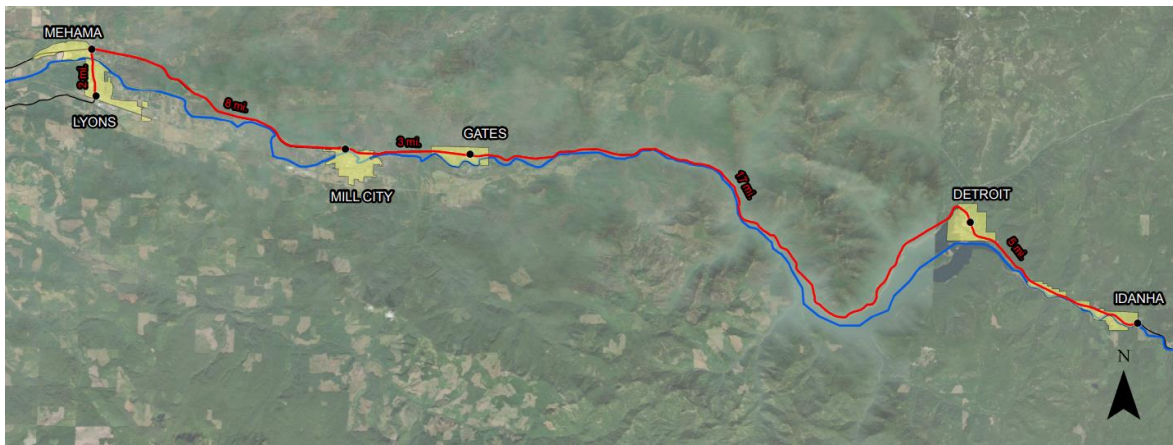
ES. EXECUTIVE SUMMARY

In 2020, Keller Associates was contracted to complete a Wastewater Master Plan for a proposed joint sewer project between Detroit, Gates, Idanha, and Mill City. This Wastewater Master Plan provides evaluation and selection of alternatives, cost estimates and details needed to guide the NSSA in providing community wastewater systems that will meet their long-term needs and be financially sustainable. This document serves as the stand-alone summary of the project engineering recommendations.

ES-1 PURPOSE AND BACKGROUND

The North Santiam Canyon (NSC) is located in Marion and Linn Counties, about one hour east of the Oregon Capitol, City of Salem. The Canyon area includes the cities of Lyons/Mehama, Mill City, Gates, Detroit and Idanha. These communities are located along State Highway 22 and serve as a gateway to the nearby Cascade mountains and North Santiam River recreation areas. Figure ES-1 shows the location of the four communities in the NSSA and the outside communities of Lyons and Mehama. Mill City, Gates, Detroit, and Idanha have a combined population of 2,730 per 2019 Portland State University population data. These NSC communities are surrounded by federal, state, and county lands which limits growth beyond their current UGB's.

FIGURE ES-1: STUDY AREA



Over the last twenty-five years, the NSC has experienced severe economic distress fueled by a sharp decline in economic activity. A reduction of employment in the timber industry has had a profound impact on the ability of local governments in the Canyon to provide essential services to their citizens.

Although the NSC has retained strength in its community roots the economic situation in the Canyon has negatively impacted the ability of families to make a decent wage and remain in the area. A lack of community facilities and ability to maintain public infrastructure among reduced populations prevents businesses from locating in the region and is forcing residents to move toward larger population centers or commute further to work.

Tourism and outdoor recreation have become an important part of the Canyon's economy as activities near Detroit Lake continue to drive and attract users from around the state. However, current wastewater infrastructure remains a limiting factor to reach the region's full economic potential and to protect the water resources of the North Santiam Watershed from widespread septic system failures. The water from this watershed serves more than 225,000 residents daily, many of which are down stream and outside the watershed such as the Oregon Capitol, the City of Salem.



ES.1.1 Economic Studies

The North Santiam Canyon Economic Opportunity Study was completed in 2000 in response to the designation of the Opal Creek Wilderness and Scenic Recreation Area. The purpose of the study was to determine the best use of \$15 million that were authorized to support economic development activities for the communities resulting from the transfer of the federal lands and its impact upon the area. Unfortunately, the promised funds never materialized. In 2014, the study was updated and resubmitted to the USDA with the hopes of improving the persistent conditions of economic distress.

Currently, inadequate wastewater infrastructure prevents many businesses from expanding or locating in the region. While each community has its own infrastructure constraints, they share a common constraint that originates from the Oregon Three-Basin Rule (OAR 340-041-0350). This Oregon Administrative Rule prohibits any discharge of treated wastewater to the nearby North Santiam River which would, in general, be a standard practice after appropriate treatment.

ES.1.2 Urgency Post Fires

The Beachie Creek and Lionshead fires in 2020 heavily impacted the communities in the NSC - including, Detroit, Gates, Idanha, and Mill City. The loss of residential homes and buildings has devastated an already economically distressed region.

The wildfires caused substantial structural destruction and water infrastructure damage in the North Santiam Canyon. At last count, 720 structures were destroyed throughout Marion County and the fire spread into Linn County destroying 193 structures.¹



The wildfires and the mass destruction created additional pressure to obtain permits for septic repairs or new septic systems for recovering business owners and residents. The permitting challenge and costs to repair or replace septic systems will likely stall the recovery process for many in the region.

¹ OREGON OFFICE OF EMERGENCY MANAGEMENT 2020 Oregon Wildfire Spotlight

ES.1.3 Funding

In 2021, Marion County submitted a Capital Funding Request to the Oregon Legislature on behalf of the NSSA for \$50 million. The funding was approved under HB5006-A for the North Santiam Canyon Sewer Project. The initial funding request was broken down into two distinct projects; Project A: Gates/ Mill City and Project B: Interim Measures Detroit/Idanha. Additional funds will be necessary to allow for the project to remain geologically sustainable and financially viable for years to come. The recommended proposals now funded in this master plan are anticipated to fully comply with the Three Basin Rule.

It is expected a strategic combination of state and federal grants/appropriations and potentially some revenue bonds will be necessary to fully fund this project. Since the NSSA was formed under ORS 190, the organization may only seek out revenue bonds based on the services provided. Other non-traditional avenues for funding and revenue should also be pursued to narrow the ongoing annual operation and maintenance costs for this economically distressed area.

ES.1.4 Feasibility Study and Formation of the Sewer Authority

In January 2017, Keller Associates completed a Regional Wastewater Analysis for the NSC. The report recommended a comparison of alternative approaches to move forward.

Next steps included further evaluation of collection, treatment, and disposal systems. Additional recommendations advised forming a wastewater facility planning committee to review the merits of each of the governance option and provide city leaders time to consider options, create a unified vision of future wastewater facilities and services while developing a strategic plan that outlines a path forward.

The North Santiam Joint Sewer Task Force met for more than four years to make important decisions regarding the future of NSC wastewater infrastructure. In May 2020, the Parties (Detroit, Gates, Idanha, and Mill City) created the North Santiam Sewer Authority (NSSA), formed by an intergovernmental agreement under the auspices of ORS Chapter 190. The Parties agreed and acknowledged that the NSSA shall exist and operate independently from each city's own governing bodies.

ES-2 HISTORIC EFFORTS AND CURRENT WASTEWATER MANAGEMENT

Previous efforts to provide cities in the NSC with community sewer systems are documented through several historical studies. These studies have sought to determine the project's feasibility, evaluate alternatives, and perform preliminary engineering for wastewater systems designed to meet the individual needs of the communities within the NSC. A list of the key studies referenced for this master plan are listed below.

- Upper North Santiam River Canyon Sewage Treatment Feasibility Study, 1996
- Gates Sanitary Survey, 1999
- Detroit-Idanha WW Facilities Pre-Design Report 2001
- Detroit-Idanha VE Study Conceptual Design Review, 2002
- Sanitary Survey of On-Site Sewage Disposal Systems – Detroit & Idanha, 2003
- Idanha Wastewater Facility Plan Update, 2008/2009
- Mill City Wastewater O&M Manual, 2010
- Detroit Wastewater Feasibility Study, 2015
- North Santiam Canyon Regional Wastewater Analysis, 2017

Amongst the views of tall evergreen trees, surrounding mountains, and glistening bodies of water, it is not uncommon to see port-a-potties dispersed throughout the NSC. This is due, in part, to the communities of Idanha, Detroit, and Gates lacking community sanitary sewer systems. Residents and businesses in those communities rely on individually managed septic systems.

In a 2003 sanitary survey, performed by the Oregon Department of Environmental Quality (DEQ), noted many of the individual systems in Detroit consist of cesspools on small lots, which do not meet existing standards or on-site sewage systems. Cities surveyed by DEQ that year in the region has a failure rate of 34-37 percent.

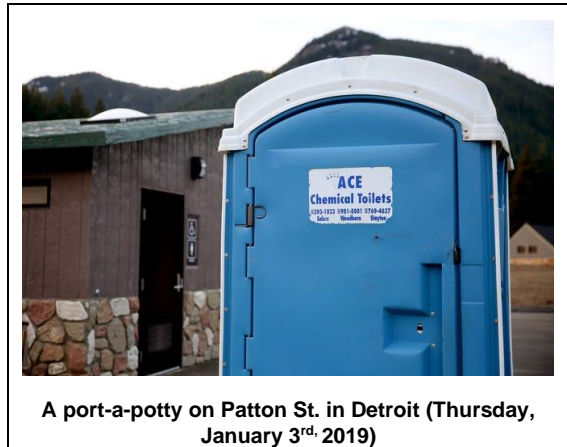
Mill City is the only city in the study area that operates a community sanitary sewer system. The majority of the collection and treatment systems were built in 1992. In 2009, all three collection system pump stations were replaced, as well as some treatment system components. Mill City has some urgent and immediate needs and anticipates significant investments necessary to increase capacity to handle the projected growth.

ES-3 POPULATION PROJECTIONS

Planning criteria was established to refine the details for providing community wastewater services to these four communities in the NSC. The goal for the project is to have the system be geologically suitable, environmentally sustainable, financially feasible, and politically viable.

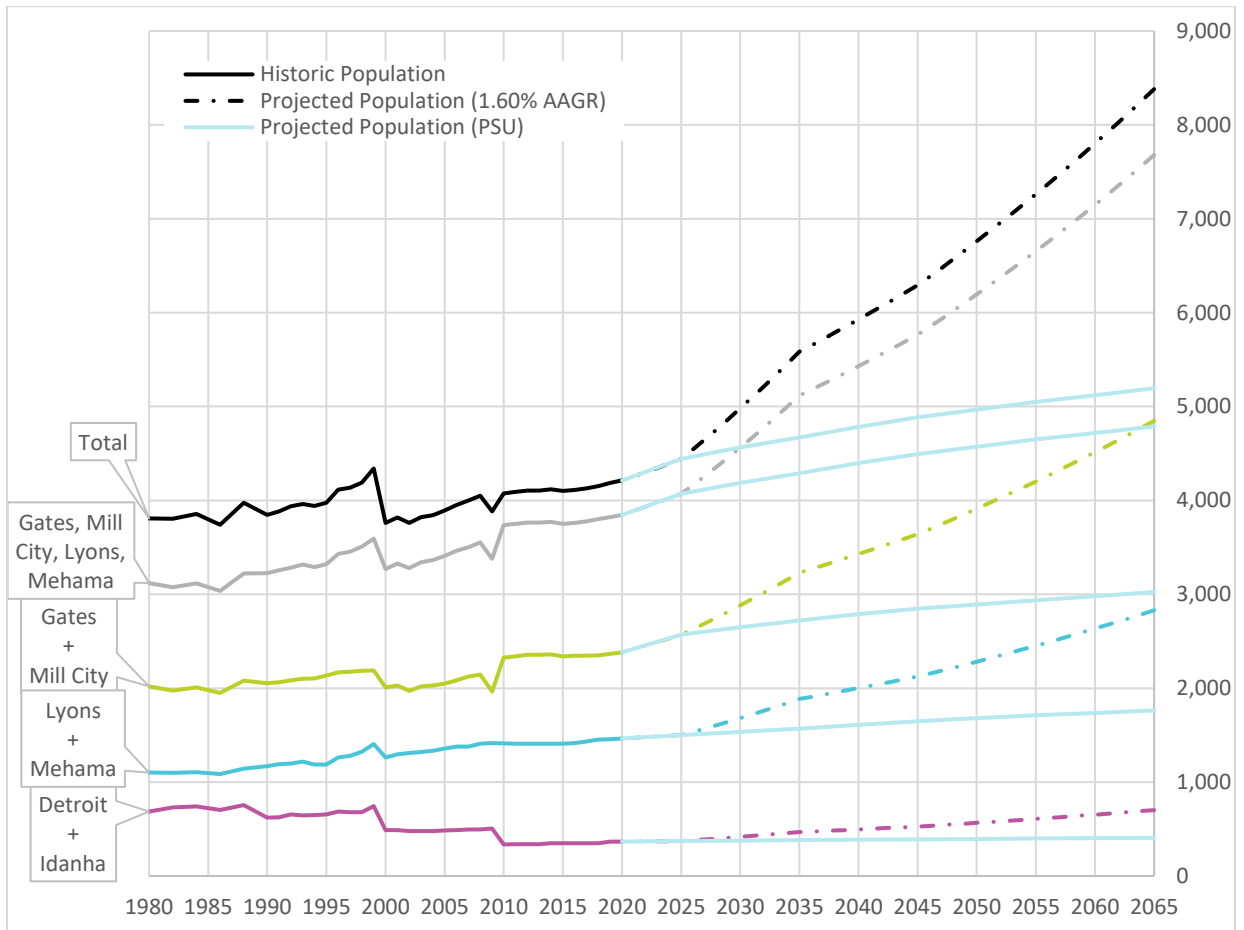
ES.3.1 Population

Historical and projected population was retrieved from Portland State University (PSU) and a case study of the nearby city of Sisters was utilized to evaluate future growth projections and scenarios. Sisters, Oregon shares many similarities with the NSC region. The city attributes much of its rapid population growth to the construction of a community wastewater system in 2002. The Sisters case study was used to develop an annual average growth rate (AAGR) for the communities in the NSC at 1.60% as shown in Chart ES-1



A port-a-potty on Patton St. in Detroit (Thursday, January 3rd, 2019)

CHART ES-1: PROPOSED AAGR, COMBINED SYSTEMS



ES-4 REGIONALIZATION

“Economy of scale” is a phrase used to explain why large facilities are usually overall less expensive to build than small facilities. The fixed costs of a project apply regardless of the size of the project. Additionally, the relationship between project size and project cost is typically not a linear one. Neglecting fixed costs, constructing a two-million-gallon water tank would still be expected to cost less per gallon than a one-million-gallon water tank. Administrative costs will also be less per customer as the number of customers increase. Because of this economy of scale, it is recommended that NSSA regionalize their wastewater treatment services. Another financial advantage of a regional wastewater facility is having *more* customers to share the burden of paying the bills.

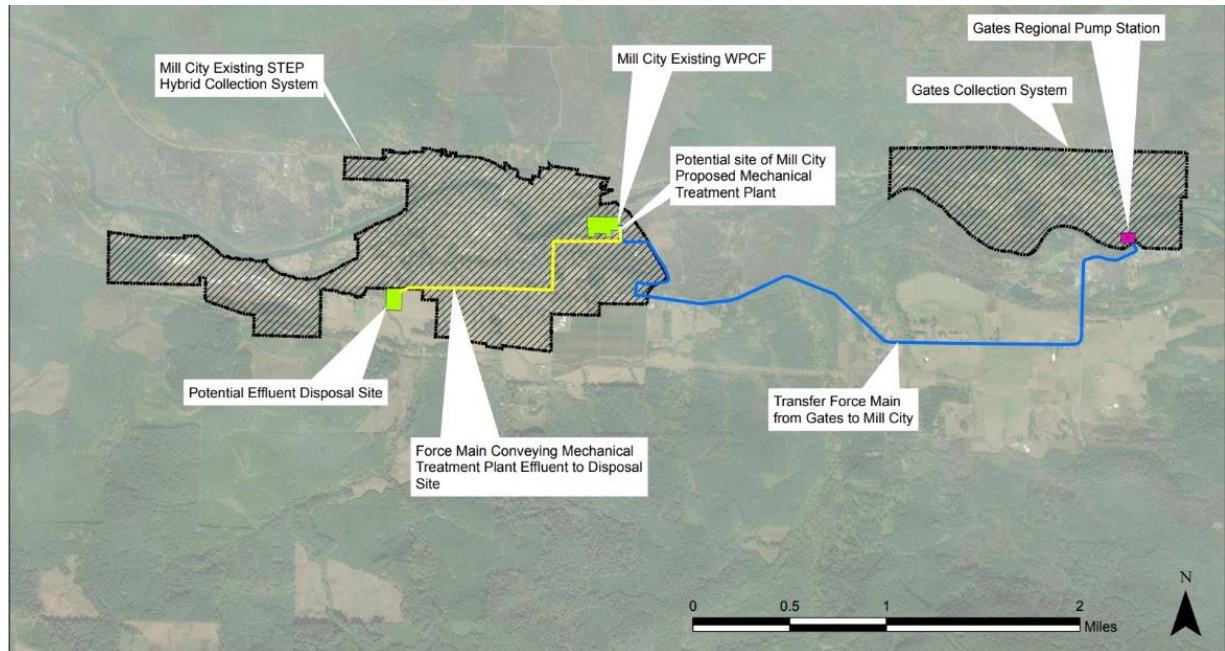
Keller Associates recommends that the NSSA establish the two sanitary sewer basins described below.

ES.4.1 Mill City and Gates Basin

One of the two proposed basins encompasses Mill City and Gates (Figure ES-2). Wastewater flows would be collected in Gates and conveyed to Mill City via a regional lift station and force

main. Wastewater flows from Mill City would combine with the incoming flows from Gates at a new mechanical treatment plant. Treated effluent at the proposed mechanical treatment plant will be disposed of, to a new rapid infiltration basin. The figure below provides an overview of the Mill City and Gates basin.

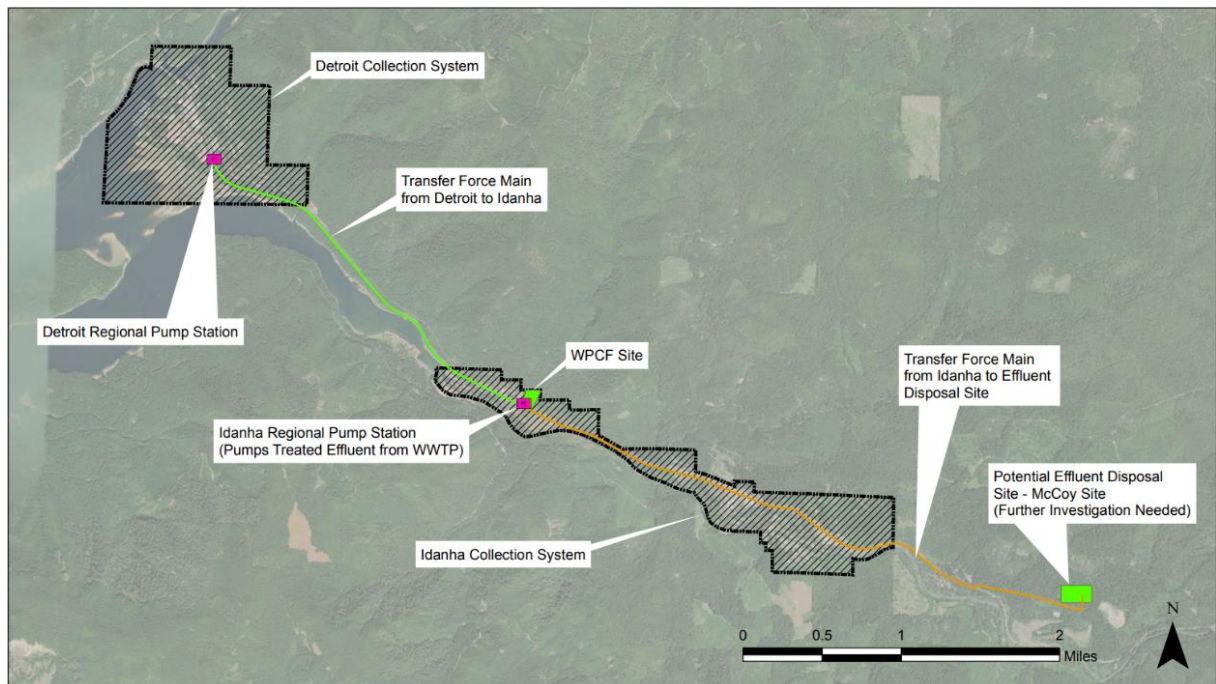
FIGURE ES-2: MILL CITY AND GATES BASIN



ES.4.2 Detroit and Idanha Basin

The other proposed basin will service Detroit and Idanha (Figure ES-3). Wastewater flows would be collected in Detroit and conveyed to Idanha via a regional lift station and force main. Wastewater flows collected from Idanha would combine with the flows from Detroit at an advanced mechanical wastewater treatment plant located near Blowout Road. Treated effluent would be disposed of at one of the three identified properties (McCoy, Ranger Station, or South Shore sites). The figure below provides an overview of the Detroit and Idanha basin.

FIGURE ES-3: DETROIT AND IDANHA BASIN



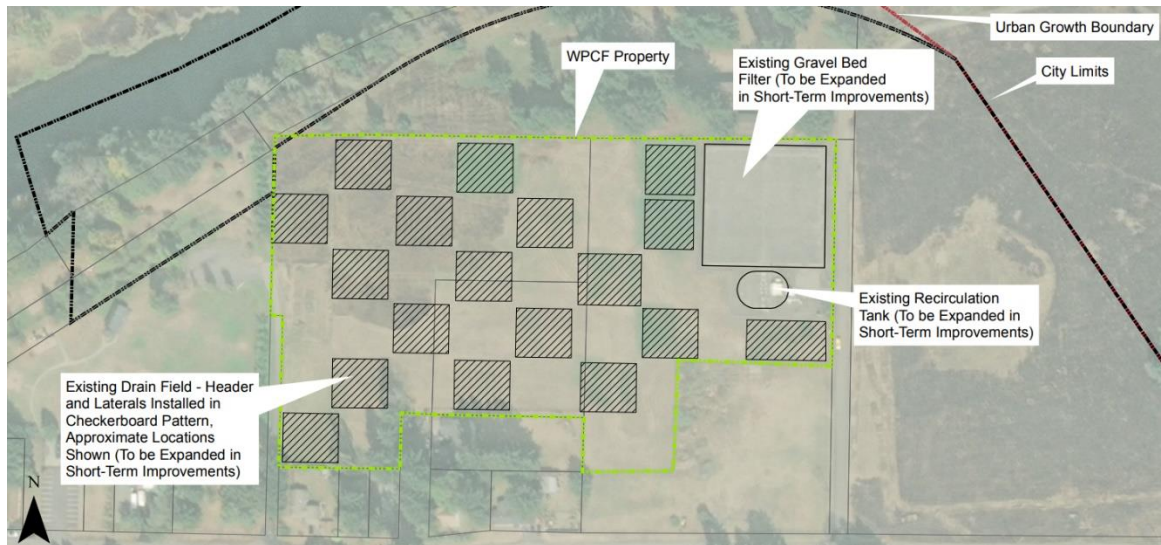
ES-5 COLLECTION SYSTEMS

Keller Associates examined the feasibility of constructing gravity and septic tank effluent pumping (STEP) collection systems in Gates, Detroit, and Idanha. The cost of a complete overhaul of Mill City's existing septic tank effluent gravity (STEG)/STEP system is tentatively estimated to cost over \$15 million, making this option cost prohibitive. Instead, it is recommended that Mill City and after acquisition, the NSSA continue to operate the existing STEG/STEP system and perform upgrades and expansions, as necessary. It is recommended that the NSSA proceed with the further planning, design, and construction of gravity collection systems for Gates, Detroit, and Idanha.

ES-6 MILL CITY EXISTING SYSTEM IMPROVEMENTS

Immediate improvements are needed to address the operations and capacity of Mill City's existing water pollution control facility (WPCF). Mill City's current WPCF could expand the recirculating gravel bed filter (RGF) and the existing drain field. Because the long-term recommendation includes a mechanical treatment plant with a higher quality effluent, Keller Associates recommends that Mill City and the NSSA take steps toward developing the mechanical treatment plant in lieu of expanding the capacity of the RGF and drain field. This would prevent the sunk cost associated with the short-term improvements for expanding the RGF. This may delay the short-term expansion in Mill City but will provide a better long-term solution. A site layout of Mill City's existing WPCF is shown in Figure ES-4 below. Note that because of recent wildfires, the site proposed for WPCF expansion is currently occupied by FEMA trailers.

FIGURE ES-4: EXISTING MILL CITY WPCF



ES.6.1 Short-Term Improvements

Much of the existing equipment at Mill City's WPCF is reaching the end of its useful life. Keller Associates recommends that Mill City perform immediate improvements to short-lived assets (pumps, fans, valves, etc.). These improvements are needed to keep the WPCF treating wastewater at its current rated capacity until the new mechanical treatment plant can be operable.

ES.6.2 Capacity Expansion

Immediate improvements are needed to address the capacity of Mill City's existing WPCF. Keller Associates recommends that Mill City begin the process to develop a new mechanical treatment plant that will be consistent with the recommended scenario. Additional coordination and approval from DEQ will be required to allow for use of the existing drain field or expansion of the drain field in an interim status until a new RIB can be sited, tested, and approved by the DEQ. Due to this process and the time required, it does not provide enough of a time savings to go through the process of approving new drain field for the new mechanical treatment plant. The DEQ has indicated that moving directly to a preliminary engineering report (PER) in lieu of a Facilities Planning Study (FPS) could be acceptable given the extenuating circumstances in the canyon. The schedule presented later in this executive summary assumes some overlap but does allow for both the FPS and PER process.

ES.6.3 Interim New Connections

While the PDWWF design conditions are above the existing WPCF's capacity, it is also recommended that Mill City and the NSSA begin communications with DEQ to show that progress is being made toward a solution.

The DEQ may also allow Mill City to add new connections with the understanding and commitment that the long-term solution will be funded and implemented. Early discussions along with better details on what type of connections and how many are being requested will be required for the DEQ to provide meaningful input and make any decision.

ES-7 WASTEWATER TREATMENT

To provide the level of treatment necessary for effluent disposal in the North Santiam Canyon (NSC), Keller Associates examined the type and potential site of a treatment plant facility in each of the proposed basins.

ES.7.1 Treatment in the Mill City and Gates Basin

Keller Associates recommends the NSSA proceed with the planning, design, and construction of a new mechanical wastewater treatment plant on property adjacent to the existing Mill City WPCF. Flows from Gates and Mill City will be combined ahead of the new mechanical treatment plant. The expected performance of a mechanical treatment plant is provided in Table ES-1 below.

TABLE ES-1: EXPECTED EFFLUENT QUALITY FROM MECHANICAL TREATMENT PLANT

Contaminant	Units	Value
BOD	mg/L	<20
TSS	mg/L	<20
Ammonia	mg/L	<5
Nitrates	mg/L	<5
Turbidity	NTU	<1
E. coli	no/100 mL	<2.2

ES.7.2 Treatment in the Detroit and Idanha Basin

Keller Associates recommends flows from the Detroit and Idanha basin be treated by a new advanced mechanical wastewater treatment plant located in Idanha, near Blowout Road. The expected performance of an advanced mechanical treatment plant is provided in Table ES-2 below.

TABLE ES-2: EXPECTED EFFLUENT QUALITY FROM ADVANCED MECHANICAL TREATMENT PLANT

Contaminant	Units	Value
BOD	mg/L	<20
TSS	mg/L	<20
Ammonia	mg/L	<5
Nitrates	mg/L	<5
Phosphorus	mg/L	<0.3
Turbidity	NTU	<0.2
E. coli	no/100 mL	<2.2

ES-8 EFFLUENT DISPOSAL

The Three Basin Rule provides many challenges regarding effluent disposal in the NSC. Keller Associates examined several effluent disposal options including drainage fields, surface

infiltration, land application, injection wells and aquifer recharge, and surface discharge to the North Santiam River with a modification to the Three Basin Rule.

ES.8.1 Disposal in the Mill City and Gates Basin

Keller Associates recommends that treated effluent from the new mechanical treatment plant be pumped through a force main to a site suitable for disposal in a rapid infiltration basin (RIB). One potential site is located outside of city limits to the southwest.

GSI's recommendations are to continue to engage with the DEQ to identify testing and regulatory requirements as well as identifying a specific site where an agreement can be agreed upon with the property owner and begin the site-specific testing and monitoring.

ES.8.2 Disposal in the Detroit and Idanha Basin

Keller Associates recommends that the Detroit and Idanha basin dispose of effluent in an RIB. Three potential sites, McCoy, Ranger Station, and South Shore require further investigation to determine their suitability as an RIB.

GSI recommends that the McCoy site should be further explored and confirmed or ruled out prior to advancing any significant additional efforts related to the other two potential sites.

ES-9 ENVIRONMENTAL PERMITTING

A summary of initial environmental permitting considerations for the proposed NSSA project are listed below. The list includes key permits, authorizations, and necessary coordination (approving agency).

- Clean Water Act 404 permit (U.S. Army Corps of Engineers [USACE])
- Clean Water Act 401 water quality certification (Oregon Department of Environmental Quality [ODEQ])
- Oregon Removal/Fill permit (Oregon Department of State Lands [DSL])
- Endangered Species Act (ESA) Section 7 consultation (U.S Fish and Wildlife Service [USFWS] and National Marine Fisheries Service [NMFS])
- Magnuson-Stevens Essential Fish Habitat Assessment (NMFS)
- Migratory Bird Treaty Act (USFWS)
- Bald and Golden Eagle Protection Act (USFWS)
- National Historic Preservation Act Section 106 consultation (Oregon State Historic Preservation Officer [SHPO]) and Tribal coordination.
- National Environmental Policy Act – there may be multiple NEPA requirements (i.e., different aspects of the project may involve federal decisions requiring NEPA and different agencies will have different needs) (U.S. Forest Service [USFS], U.S. Department of Agriculture [USDA], Oregon Department of Transportation [ODOT])
- Special Use Permit (USFS)
- Right of Way approvals (City, County, ODOT, USFS)

- Fish Passage Assessments and Approval (Oregon Department of Fish and Wildlife [ODFW])
- Air Quality Construction Permit (ODEQ)
- NPDES Stormwater General Permit (ODEQ)
- Local permits/approvals - Specific permit requirements will vary by city and/or county and according to site specific environmental and land use conditions. Examples of common permits include land use permits, zoning variances, general development permits, and floodplain development permits

It is anticipated that the project permitting may be broken up into phases if one could provide rationale that each segment had independent utility (i.e., each segment could stand alone as a single project and would be constructed absent the construction of the other segment – that is, it did not rely on the other segment to be completed). General notes regarding permitting strategy are listed below.

- Though the project may be phased by funding sources, unless segments of the project have independent utility, they will need to be permitted all together (regardless of funding phases).
- There may be opportunities to permit Mill City and Gates together and then Detroit and Idanha together (i.e., it may be possible to show independent utility for these 2 different segments of the project).
- There may also be opportunities to pursue efficiencies by preparing programmatic agreements for the entire project with various agencies. Programmatic agreements can be used for large, long-term, or frequent actions and allow an expedited review process by identifying general effects and standard mitigation measures. These could be developed collaboratively as the project proceeds. An example would be a programmatic agreement to cover NHPA Section 106 consultation for cultural resources.
- Permit applications and NEPA generally need at least a 30% design. Some permits or authorizations (e.g., 404 permit application and ESA consultation) will require more advanced design information.
- Permitting strategies depend on funding sources, timing, and scope of phases that funding enables.

Assumptions made during the formulation of the two lists above are shown below.

- USFS would require an environmental impact study (EIS) for the anticipated Special Use Permit, or land acquisition under the Townsites Act.
- An individual permit authorization under Clean Water Act Section 404 would be required.
- Biological Assessment(s) for USFWS and NMFS would be required for Endangered Species Act compliance.
- The project would be designed to avoid impacts to environmental resources wherever feasible.

- Permitting for any required mitigation is not included.
- Permitting for wastewater treatment facilities would be led by the engineering team.

ES-10 COST SUMMARY

Capital costs developed for the recommended improvements are Class 4 estimates as defined by the Association for the Advancement of Cost Engineering (AACE). Actual construction costs may differ from the estimates presented, depending on specific design requirements and the economic climate when a project is bid. As a result, the final project costs will vary from the estimated presented in this document.

The costs are based on cost estimating resources and experience with similar/recent wastewater projects and were developed based on 2021 dollars. The total estimated probable project costs include contractor markups and 30% contingencies, which is typical of a planning-level estimate. Overall project costs include total construction costs, costs for engineering design, construction management services, inspection, as well as construction administrative costs.

Total capital and annual costs for the recommended treatment and disposal scenario, including the recommended collection system option is summarized in Table ES-3.

TABLE ES-3: RECOMMENDED COLLECTION, TREATMENT AND DISPOSAL COSTS

Capital Cost	Annual Cost
\$106.2M	\$0.44M

Total capital costs for the recommended Scenario are summarized in more detail in Table ES-4.

TABLE ES-4: COST SUMMARY

Item	Cost
MILL CITY EXISTING SYSTEM IMPROVEMENTS	
Short-Term Improvements	\$176,000
MILL CITY EXISTING SYSTEM IMPROVEMENTS TOTAL	\$176,000
MILL CITY AND GATES BASIN	
Demolition of Existing RGF Plant	\$ 300,000
New WPCF (Mill and Gates, 255,000 gpd)	\$ 5,272,000
Effluent Pressure Pipe to Infiltration Basins	\$ 3,750,000
Gates Collection System (Gravity)	\$ 10,534,000
Gates Pump Stations	\$ 680,000
Subtotal	\$ 20,536,000
General Conditions (10%)	\$ 2,054,000
Contractor OH&P (15%)	\$ 3,081,000
Contingency (30%)	\$ 7,702,000
General and Administrative Costs (30%)	\$ 10,012,000
Total Construction Cost	\$ 43,385,000
Land Purchase	
Easements	\$ 46,000
Pump Stations	\$ 450,000
Land for Infiltration Basins	\$ 1,000,000
Drainage Field for Short-Term Improvements	\$ 100,000
Total Land Purchase Costs	\$ 1,596,000
MILL CITY AND GATES BASIN TOTAL	\$ 45,157,000
DETROIT AND IDANHA BASIN	
New WPCF (Detroit and Idanha, 124,000 gpd)	\$ 5,925,000
Effluent Pressure Pipe to McCoy Site	\$ 2,376,000
Effluent Pump Stations to McCoy Site	\$ 200,000
Drain Fields For McCoy Site	\$ 549,000
Detroit Collection System (Gravity)	\$ 13,014,000
Detroit Pump Stations	\$ 680,000
Idanha Collection System (Gravity)	\$ 5,480,000
Idanha Pump Stations	\$ 340,000
Subtotal	\$ 28,564,000
General Conditions (10%)	\$ 2,857,000
Contractor OH&P (15%)	\$ 4,285,000
Contingency (30%)	\$ 10,712,000
General and Administrative Costs (30%)	\$ 13,926,000
Total Construction Cost	\$ 60,344,000
Land Purchase	
Easements	\$ 46,000
Pump Stations	\$ 450,000
Land at Gravel Pit	\$ 200,000
Total Land Purchase Costs	\$ 696,000
DETROIT AND IDANHA TOTAL	\$ 61,040,000
TOTAL (Without Mill City Short-Term Improvements)	\$ 106,021,000
TOTAL (With Mill City Short-Term Improvements)	\$ 106,197,000

ES-11 COST ASSOCIATED WITH DIFFERING

The recommendation for the collection system option and treatment/disposal scenario do not represent the least cost option. For treatment/disposal, the least cost option is not compliant with the Three Basin Rule and therefore was not deemed to be in the interest of the NSSA to pursue. Changing the Three Basin Rule would likely be time and resource intensive and would likely have significant stakeholder and public comments. The delay to the project could not be estimated.

Similarly, the collection system option selected is estimated to have a higher capital cost, yet lower annual operation and maintenance costs. After consulting with the Board to better understand their priorities and with the intention of recommending the option that represents a better long term financially sustainable scenario, the gravity collection system is the option that was selected by the board for further consideration and development. The need to limit annual O&M costs was also more apparent after the Business Case Scenario was completed by FCS Group.

ES-12 BUSINESS CASE SCENARIO

FCS Group prepared a business case scenario. The purpose of the business case scenario was to identify and test the conditions under which a new regional wastewater system in the NSC could be economically viable. It includes an explanation of the key variables that would drive financial feasibility, reasonable assumptions about those variables, and an analysis of the alternative choices available to the decision-makers whose support would be necessary. Based on their findings; the following are the recommended next steps from FCS Group.

- The development of a phasing plan for project costs.
- A year-by-year forecast of potential EDUs by phasing area, including the potential for new growth as well as reconstruction of existing homes and businesses on septic.
- Refinement of the O&M cost estimates.
- A series of policy decisions that will help narrow the range of potential sewer rates.
- Design of either a connection requirement or a package of incentives and requirements that might encourage conversion from septic to sewer, once a sewer line is within range.
- Design of requirements for sewer extensions and connections associated with new development, where there is no existing septic system.
- Continued efforts to obtain funding support from the State and Federal governments.

ES-13 POLICY DECISIONS

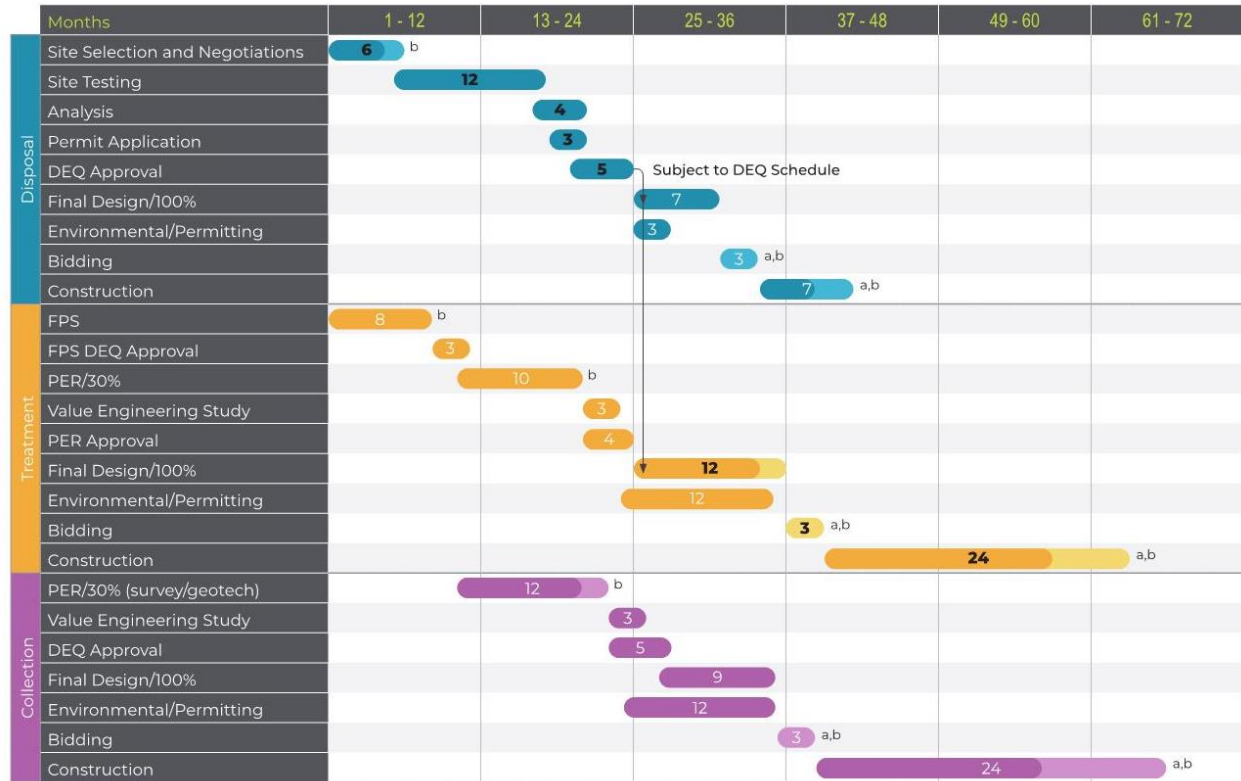
Keller Associates recommends the NSSA Board evaluate and prioritize policy decisions and create a timeline for each one. Certain policy decisions will need to be completed before the financial plan and/or engineering can be completed.

ES-14 PROJECT PHASING / PATH

Charts ES-2 and ES-3 summarize the estimated schedule for the NSSA project by treatment / disposal basin. The schedules indicate potential savings in time by compressing some project components. Many items within the schedule are out of the control of the NSSA or Keller

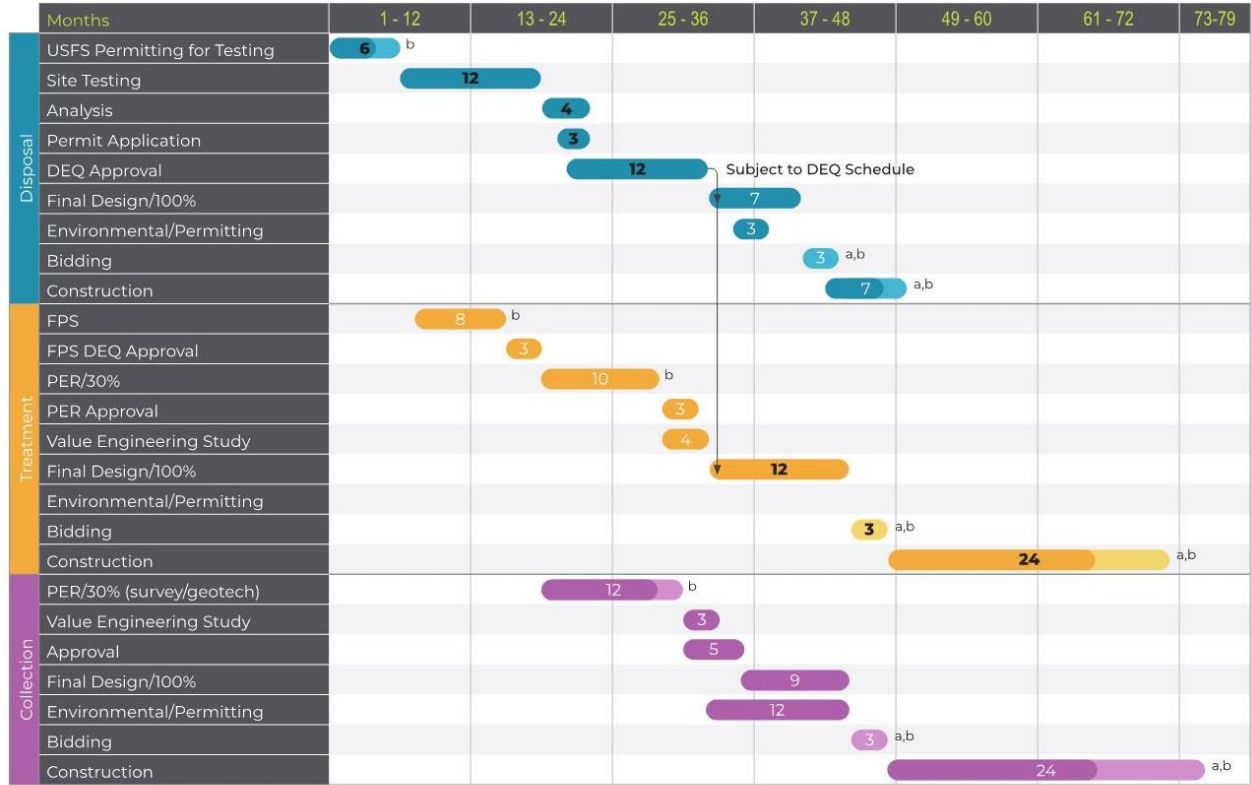
Associates and are the best estimates based on discussions with regulators and experience with other projects. As the project development gets closer to construction, advancing or delaying construction may be necessary depending on the typical construction season in the NSC. A Gantt chart for each basin is presented on the next two pages.

CHART ES-2: NSSA PROJECT SCHEDULE - MILL CITY / GATES



Bold Text - Indicates critical path in schedule
 a = Could start earlier, compress, or eliminate this schedule item with CM/GC alternative delivery
 b = Potential to compress this schedule item
 ● ● ● = Lighter shade represents estimate of potential to compress schedule

CHART ES-3: NSSA PROJECT SCHEDULE - DETROIT / IDANHA



Bold Text - Indicates critical path in schedule

a = Could start earlier, compress, or eliminate this schedule item with CM/GC alternative delivery

b = Potential to compress this schedule item

● ● ● = Lighter shade represents estimate of potential to compress schedule

ES-15 IMMEDIATE ACTION ITEMS

In the near term the following is a list of recommended action items:

- Negotiate scope / fee for Phase 2 engineering services
 - Develop environmental permitting plan (SWCA)
 - Permitting and subsurface investigation (GSI)
 - Site specific testing, monitoring, and analysis
 - WPCF permit application support and negotiations with DEQ
 - Mill City / Gates basin Facilities Planning Study for DEQ approval
 - Mill City WPCF short term improvements
- Engage with owners of potential properties in Mill City area, select site and negotiate.
- Population growth study for PSU concurrence
- Negotiate with DEQ for interim connections to existing Mill City system
- Continue to pursue additional funding
- Business case scenario recommendations
- Evaluate key decisions
 - Requirement to connect
 - Sewer connection recommendations for rebuilding effort
 - Decommissioning of abandoned septic tanks
 - Utility easements, NSSA ownership limits
 - Purchasing of Mill City assets
 - Income / Household survey
 - Liability for sewer backups
 - Pretreatment ordinance (wastewater strength requirements)

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