Preliminary Engineering Report

Four Creeks Ranch Water System

Consolidation with King County Water District 90

Ref DEA KCOX0W902001
January 25, 2022

DAVID EVANS AND ASSOCIATES INC.

Four Creeks
Preliminary Engineering Report

Figures

APPENDIX:

Plan Certification

1. Preparation

This Report was prepared under the supervision of a Registered Professional Engineer licensed in the State of Washington.

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1/25/22

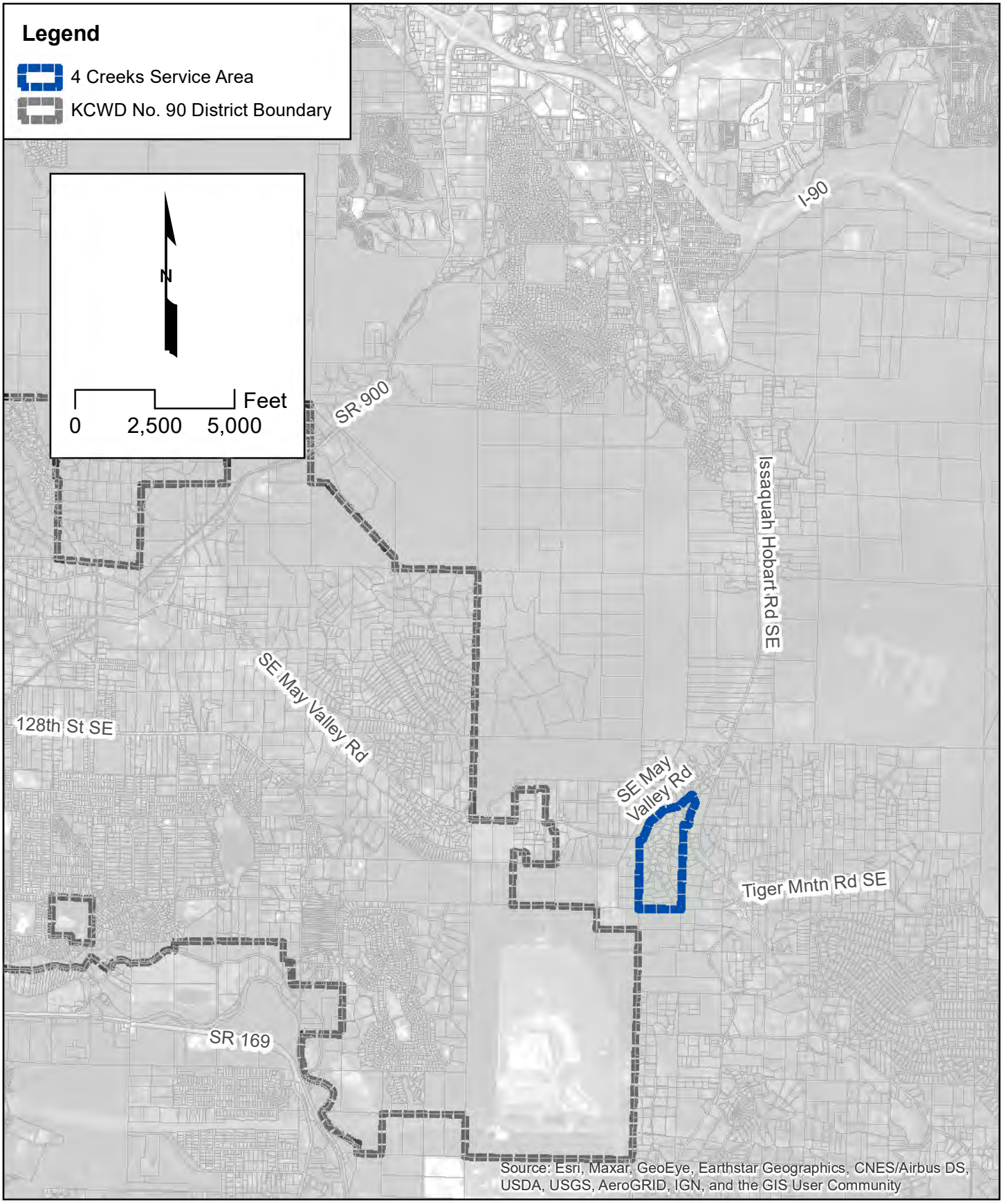
1. Introduction

The Four Creeks Ranch Water System (FCR) (DOH ID# 22740-4) is a privately owned, Community Group A water system located in unincorporated King County, just south of Issaquah and east of the Renton Highlands, Washington. The system serves approximately 150 residents with 60 active connections, fed from a single on-site well. FCR operates under a Satellite Management Agreement (SMA) with NW Water Systems based out of Port Orchard, WA. Additionally, FCR has a Time and Materials Contract with King County Water District 90 (KCWD90) (PWSID 41150), allowing for occasional water system maintenance and repairs to be performed by KCWD90.

The FCR community has previously had preliminary discussions regarding water system consolidation with KCWD90 and both parties were interested in exploring the possibility further. KCWD90 has since approached FCR to discuss a consolidation where FCR would transfer all water system assets to KCWD90 and KCWD90 would become the water service provider. The relative locations of the FCR and KCWD90 systems are shown on **Figure 1 – Vicinity Map**. FCR is approximately 1.1 miles east of the easterly edge of the KCWD90 service area boundary and nearest KCWD90 water mains.

The WA-Department of Health (DOH) has issued KCWD90 a Consolidation Feasibility Grant. The purpose of this grant is to fund a preliminary engineering study, public outreach, cultural reviews, identify land acquisition, and feasibility study for Four Creeks Ranch water system to consolidate with KCWD90 water system. A copy of the grant's Scope of Work is included in the Appendix. This report is intended to satisfy the preliminary engineering study requirement.

The water system is currently operated [SMA] by Kevin Odegard, Operator #006962 employed by NW Water Systems in Gig Harbor, WA.



King County Water District No. 90

Figure 1 - Vicinity Map

Four Creeks Feasibility Study

2. Existing Infrastructure

2.1. Service Area

Located just south of SE May Valley Road in unincorporated King County the approximately 95-acre FCR service area is accessed via three (3) residential dead-end streets (229th Dr SE, 231st Pl SE and SE 135th Ct.). The area is comprised of 60 large single-family residences. In total there are 70 parcels, with 9 vacant and 1 reserved for the community utilities, including the water storage tank. Three of the vacant parcels are owned by King County and are used for storm water retention. Heavily forested areas exist throughout, with landscaping in the areas immediate to the residences. Ground elevations are relatively flat, with a gradual increase from approximately elevation 230 feet on the northern end to elevation 400 feet on the southwest corner where the storage tank is located (elevations NAVD88).

According to DOH records, the system's operating permit is filed under category Green and is approved for 66 total connections with 60 active connections. FCR reports that there are actually 63 connections (62 metered). The permit color is based on information provided to the DOH as of January 28, 2021.

2.2. Equipment

According to GIS mapping data provided by KCWD90, the Four Creeks Ranch Water System piping consists of the following water mains and approximate lengths:

2-inch PVC – 620 feet	8-inch PVC – 7850 feet
3-inch PVC – 900 feet	8-inch DI – 500 feet
4-inch PVC – 270 feet	8-inch HDPE – 390 feet

The piping configuration is shown on **Figure 2 – Water System**.

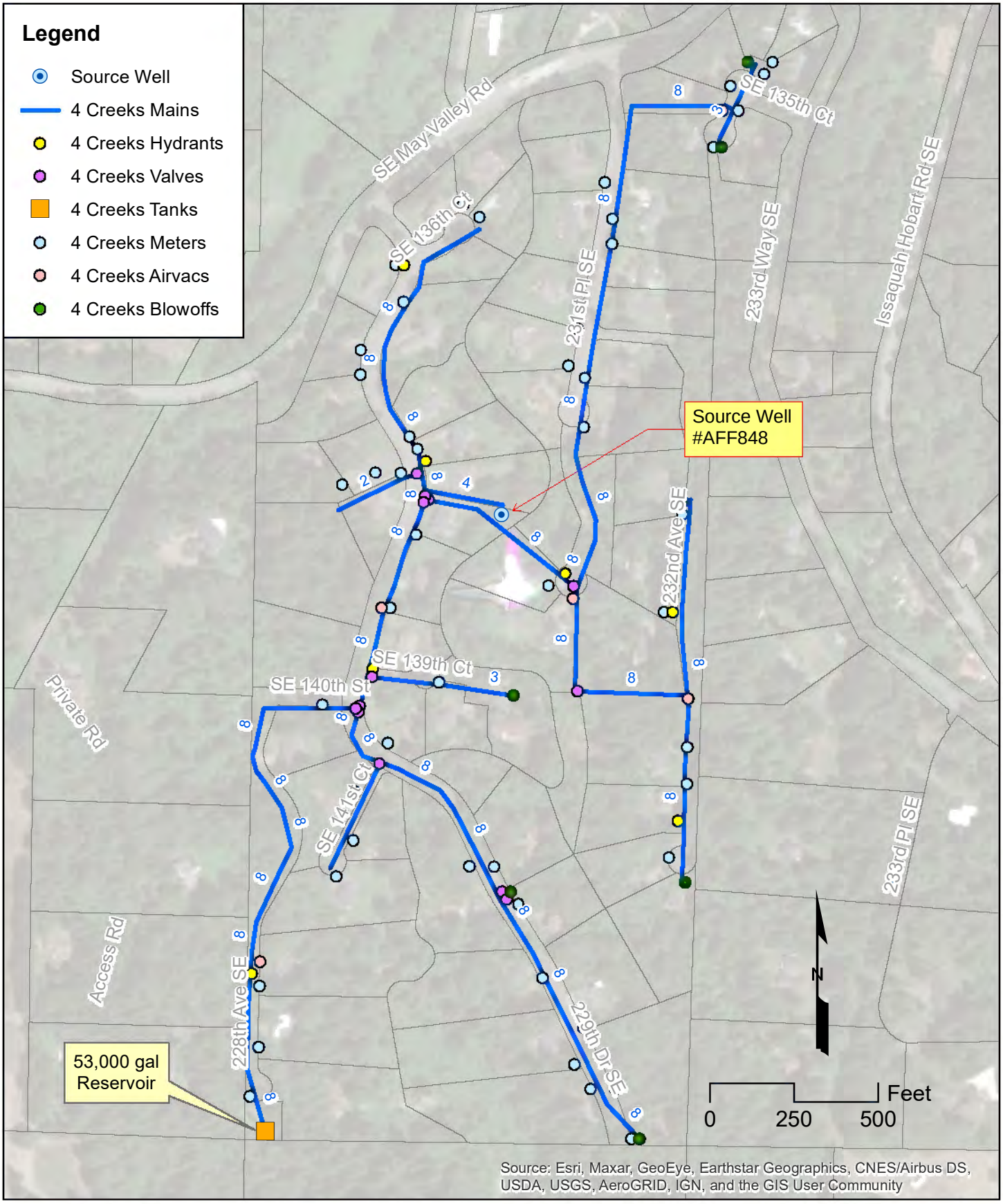
FCR reports that all service connections are metered, with the exception of one hose bib. The data also shows that there are thirteen 8-inch gate valves located throughout the system, nine fire hydrants, and seven blowoffs.

There is a 53,000-gallon storage tank located in the southeastern corner of the service area. The cylindrical storage tank is approximately 48 feet tall with a diameter of approximately 14 feet. It is installed on a concrete footing, with the top

of the footing sitting at an elevation of approximately 355 feet according to FCR as-builts.
Normal Operation – The well pump is controlled by the water level in the storage tank. The well pump discharges untreated water into the piping system, which fills the storage tank. Once the tank is full, the well pump shuts off and system pressure is provided by the elevation difference between the tank water level and the point of service.

Booster Pump – There is a 20 HP, 3Ph booster pump in a concrete vault, adjacent to the storage tank that is in place to boost (maintain) the pressure at higher flow levels (ie. Heavy irrigation or fire flow demand). The booster pump draws from the tank and discharges to the piping system. The booster pump does not run during average day water use. The operating point of the pump is 750 gpm @ 60' Total Dynamic Head (TDH). The pump is controlled by a flow sensing switch, 125 gpm set point, that starts the pump when demand exceeds the set point. There are no apparent provisions for emergency power. The pump is primarily intended to maintain fire flow, especially at the higher fire hydrant / lot elevations as the reservoir draws down.

A 48" manhole, adjacent to the booster vault, contains a Pressure Relief Valve that vents back into the upstream piping, creating a recirculation route and reducing the pressure buildup from the booster pump.



King County Water District No. 90

Figure 2 - Water System Map

Four Creeks Feasibility Study

2.3. Treatment

There is currently no water treatment within the FCR system. The system is sampled monthly and has only recorded one water quality exceedance in the last ten years. In May of 2019 there was an exceedance of Manganese recorded at 0.0680 mg/L with a maximum allowable of 0.0500 mg/L. FCR has reported staining of fixtures and clothes due to the high manganese levels.

2.4. Water Production and Water Rights

The system's water source is from a single 133-foot-deep Groundwater Well (DOE Tag # AFF848). The well is owned by the Four Creeks Homeowners Association and located on a private residence at 13743 229th Dr SE, Issaquah WA. The water rights are limited to an instantaneous rate of 60 gpm and an annual volume of 30 Acre-feet (Af/yr) intended for community use.

From 2017 through 2019 the source meter recorded an average water production of approximately 6,680,000 gallons per year or approximately 20.5 Af/yr. The source meter failed for large portions of 2015 and 2016 leaving the data unusable.

System Average Day Demand (ADD) = 6.68 MG / 365 days = 18,300 gpd.

According to KCWD90's 2015 Comprehensive Plan, for residential areas within their system, the Maximum Day Demand (MDD) is on average 2.40 times greater than the ADD.
Therefore, the estimated MDD = 18,300 x 2.40 = 43,920 gpd.

All residents of the FCR community are considered full time. The system currently serves 150 residents on 60 connections (60 ERU's).

Connection (ERU) Average Day Demand (ADD) = 18,300/60 = 305 gpd. This value is significantly higher than the 180 gallons per day per ERU average reported in KCWD90's system.

Utilizing the DOH *Water System Design Manual* Eqn. 3-1 a Peak Hour Demand (PHD) can be estimated. This equates to approximately 107 gpm, which is greater than the instantaneous water rights and the existing well pumps capabilities. This also means that operational storage is required.

PHD = (732 gal/day / 1440) [(2.5 * 60 ERU) +25] + 18 = 107 gpm

2.5. Fire Flow Analysis

According to the King County Zoning Map, the entirety of the FCR community is considered Rural. KCWD90's Comprehensive Plan notes that the required fire flow for a rural area is 1,000 gpm for 2 hours. This equates to 120,000 gallons of required fire storage water. The only form of water storage within the FCR system is the 53,000-gallon water tank. To meet the current requirements set forth by KCWD90, the FCR system would need to have access to a minimum of an additional 67,000 gallons of water storage.

It should also be noted, that due to the location of the water storage tank, some of the fire hydrants located at higher elevations, are unable to meet the 1,000-gpm flow rate. The original design was for 750 gpm for 30 minutes, which was the basis for the storage reservoir and booster pump sizing. Installing additional water mains to create loops would allow the system to provide a higher flowrate to these fire hydrants, but would still be less than current code.

3. Key Issues to Consolidation

3.1. Management Alternative

Consolidation implies taking ownership and responsibility. An alternative to consolidation would be for KCWD90 to only assist in the operation/maintenance of the FCR system. Typically this is done via a Satellite Management Agency (SMA) agreement, as is currently in place between FCR and NW Water. However, FCR was formed before the SMA requirements were adopted, allowing for KCWD90 to manage and operate the FCR water system via a negotiated agreement and not requiring KCWD90 to become a certified SMA.

According to the KCWD90 Comprehensive Plan Section 2.4.16, the District could operate the FCR through an SMA agreement or a Time & Materials style agreement. This would allow KCWD90 to operate the system without taking on the costs associated with consolidation. However, KCWD90 would not take over ownership of the system. The major steps in this process would be:

- The creation and implementation of a new agreement with FCR addressing both operation and maintenance.
- Clearly defining the responsibilities and authority of each party.

This route would forego many of the benefits outlined in sections 6.1 and 6.2 and per KCWD90 policy the FCR community would be responsible for the cost of any system upgrades.

If both parties believe the best path forward is consolidation, the following sections outline the key issues that will need to be addressed.

3.2. Service Area Revisions

Currently KCWD90's Retail Service Area boundary lies west of the FCR location. In order for KCWD90 to become the owner/operator of a water system the District's service area will need to be revised. This can be in the form of a logical extension of the current boundary which would include all area between FCR and KCWD90 or the formation of an isolated "island" boundary outside and separate from the current service area.

Service area is added to the District in the form of annexations. There are two primary formats; Election and Petition (see RCW 57.24). The Election method would start with initiation by at least 10% of the voters and need a majority (of the effected area) approval in a general election. The Election method would be applicable to either an adjacent block of area or a separate island. The Petition method requires 60% of the proposed land ownership and must be adjacent (contiguous) to the current KCWD90 boundary. The Petition method would not be applicable if only the FCR limits were included (island).

3.3. Administrative

Consolidation with the FCR would require that KCWD90's current Comprehensive Water System Plan (WSP) be amended or updated to include the new service area. KCWD90's latest System Plan was written in 2015 and approved by the DOH in 2017. This amendment would need to address the expanded service area, water right concerns, well information, and equipment. The revised WSP would then require DOH approval.

The consolidation plan must also be approved by the King County Utilities Technical Review Committee (UTRC). The Committee is charged with reviewing requests for utility right-of-way construction permits, hearing appeals on water utility service proposals and generally fulfilling the County's responsibilities under a variety of other water planning and management provisions of state law.

Currently, portions of the existing FCR infrastructure may be located on private property. The KCWD90 Comprehensive Plan Section 2.4.13 states “The District requires that all easements will be provided by the property owner to allow access for District personnel or its agents for the purposes of maintaining existing infrastructure, or the future installation of such.” Therefore, any existing or required easements need to be identified.

3.4. Methods of Consolidation

There are two methods to incorporating FCR into KCWD90. Either by Organizational Consolidation or by Direct Connection.

3.4.A. Organizational Consolidation

Organizational Consolidation consists of KCWD90 acquiring FCR but without installing a physical connection between the two systems. KCWD90 would have the ability to set the new price rates for the residents of Four Creeks and operate the system accordingly. Since there would be no physical connection, the system would operate similar to the historical precedent. This method of consolidation would entail a significantly smaller upfront cost, however, FCR would not receive any system (water source) reliability, water quality or fire flow improvements that were not locally funded. Some form of a rate increase or surcharge would be necessary to fund the identified need for expanded water storage and potential water treatment options.

This action would be a necessary first step in moving towards a physical connection, however it would provide limited physical benefit to FCR until the connection is made.

3.4.B. Direct or Physical Connection

Direct or Physical connection would entail the construction of approximately 5,700 feet of new water main to connect the two systems. Right of Way (ROW) concerns would need to be addressed, however, there is the possibility of the new water main to be installed entirely within existing KC ROW along SE May Valley Road. This potential connection is shown on Figure 3. This would require a KC ROW permit and potential adjustment to KCWD90’s Franchise Agreement with King County. Proceeding with this method would entail significant cost, estimated to be in range of $2M, as shown in Section 5.3.

Alternatively, the connection (alternate path or as a loop completion) could be constructed south of May Valley Road through private land. Much of this area is pasture and forest land, however the water main would need to pass through a minimum of three and potentially up to six individually owned properties, which may result in a higher price point due to easement acquisition cost. This potential connection is shown on Figure 4. If the existing KCWD90 system is to be used to supply water, then the Water Rights would need to be analyzed to ensure there is capacity available for the additional service area. If FCR well water is to be delivered into the KCWD90 system, then a review and potential revision to the FCR water rights will be required, plus the physical equipment to ensure water quality.

Construction of a water main extension linking FCR and the KCWD90 systems would provide FCR with a second source of water and adequate fire flow availability. KCWD90 would have access to another water source and the water main extension would provide a basis to connect other individual connections and small water systems. The FCR well would require treatment for manganese reduction and to add disinfection before it could be added to the KCWD90 distribution system.

3.5. System Operation

3.5.A. Organizational Consolidation

The FCR system could continue to operate independently under KCWD90 ownership. The FCR community would see no disruption in service. KCWD90 would need to assign staff to maintain the new service area. Other than that, day to day operation could remain the same. (See 3.4.A above)

3.5.B. Direct Connection

Construction of a physical connection between KCWD90 and FCR would not need to be completed immediately. After consolidation, FCR could continue to operate as normal, similar to the Organizational Consolidation previously described allowing KCWD90 to construct the connection over a longer period of time.

There is currently approximately one mile of space between the FCR and KCWD90 service areas. This area contains multiple private water systems. KCWD90's Comprehensive Plan, Figure 1.3, notes this area as "Future Service Area". KCWD90 could construct the connection to FCR, over a longer period of time,

consolidating with the additional small water systems, located in between the two service areas. This would allow KCWD90 to expand their service area efficiently through an area they already deem desirable. Additionally, it provides a roadmap to serving additional customers beyond the FCR community.

At the time of this report, there are approximately 27 residences adjacent to May Valley Road that are within KCWD90's service area but lack a physical connection (See Figure 3). Additionally, there are approximately 37 residences adjacent to May Valley Road in the area between the borders of KCWD90's service area and FCR's service area.

According to DOH records there are 12 private Group B Water Systems in the area, as listed below.

Nearby Small Water Systems			
System I.D.	System Name	Connections	Approved Connections
05158	Decker, E. Water System	2	2
36101	Mountain Meadows Well	7	7
02157	Johnston Noah	2	Undetermined
06789	Squak Ridge Water Association	3	6
00607	Peek Water System	3	Undetermined
06500	Bielak-Swanson	3	Undetermined
76732	Hall Plus 3	4	Undetermined
29180	Graves T	2	Undetermined
03693	Perlbach Public Water System	4	Undetermined
08675	Brockman Water	2	Undetermined
02766	South Squak Water Association	3	Undetermined
54720	Miller Farms	2	Undetermined

There are 6 small communities located directly off May Valley Road in the area between the FCR and KCWD90 border. If the connection was to be installed along May Valley Road, the expanded service area could serve approximately 50 additional residences by branching off the connection. The slow expansion towards FCR would allow KCWD90 to slowly consolidate these additional residences as they become available. A KCWD90 representative stated that there are residents in this area that have previously inquired about opportunities to consolidate into the district. If KCWD90 were to proceed with physical connection and install a water main along May Valley Road, it would create an appealing and beneficial solution for residents in the area.

There is the future potential for KCWD90 to further extend their service area eastward to the west side of Issaquah-Hobart Road. This logical extension could serve approximately 60 additional existing homes and incorporate other small private water systems.

This would bring the total potential connections (including FCR) to approximately 240. The preliminary extent of this program is shown on Figure 5.

3.5.C. Direct Wholesale Connection

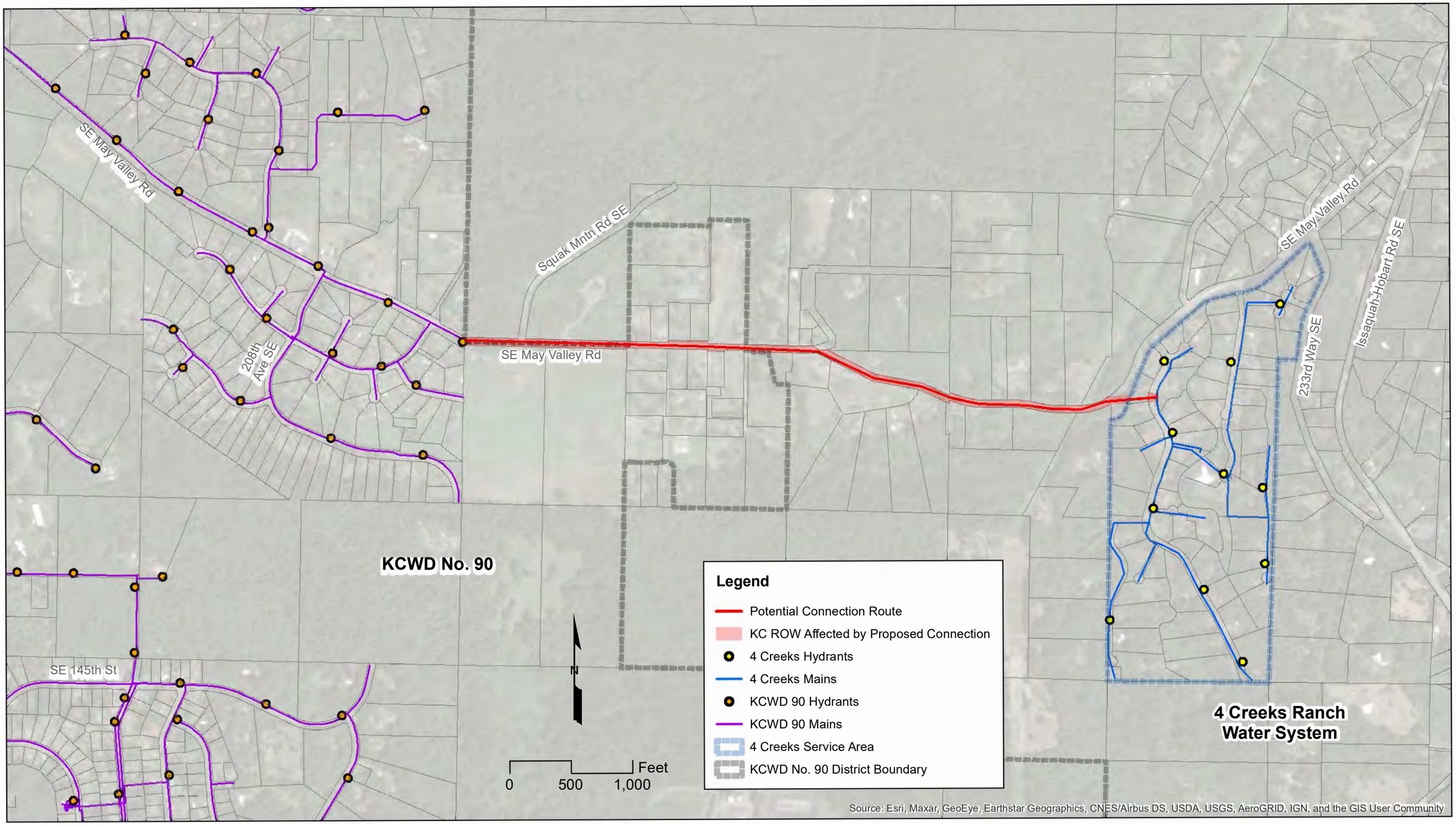
Another variation on the connection would be for FCR to remain a private water system, but to have an intertie with KCWD90. Piping needs and issues would be the same as described 3.5.B, but would have the additional requirements of a Double Detector Check Valve and Master Meter to be installed at the point of connection.

4. Identification of Improvements

Currently, the FCR system does not meet the requirements outlined in the KCWD90 Comprehensive Plan for fire flow. KCWD90 requires 1,000 gpm for 2 hours. An additional 67,000 gallons of water storage is required in order for FCR to meet this requirement. Additionally, some FCR fire hydrants are unable to produce at least 1,000 gpm due to the lack of elevation change between the hydrants and the storage tank. Installing additional water mains to create loops would lower the friction head and allow more water to access the hydrants, in order to meet the flow requirements.

If the physical connection between the two systems is selected, then KCWD90 would need to proceed with construction of approximately 5,700 feet of new water main. The water main could be installed along SE May Valley Road, within the existing KC ROW, as shown on **Figure 3 – May Valley Route**. The alternative would be to construct the connection through private lands. South of May Valley Road is mostly pasture and forest land. However, this would require construction though privately owned parcels that are not within either the KCWD90 or FCR service areas, as shown on **Figure 4 – Cedar Grove Route**. The 5,700 LF of water main distance is approximately the same for either route. The ideal configuration would be a loop that includes both routes, however this would entail approximately double the cost. Potentially, a developer improvement funded extension through a portion of the Cedar Grove route could reduce costs.

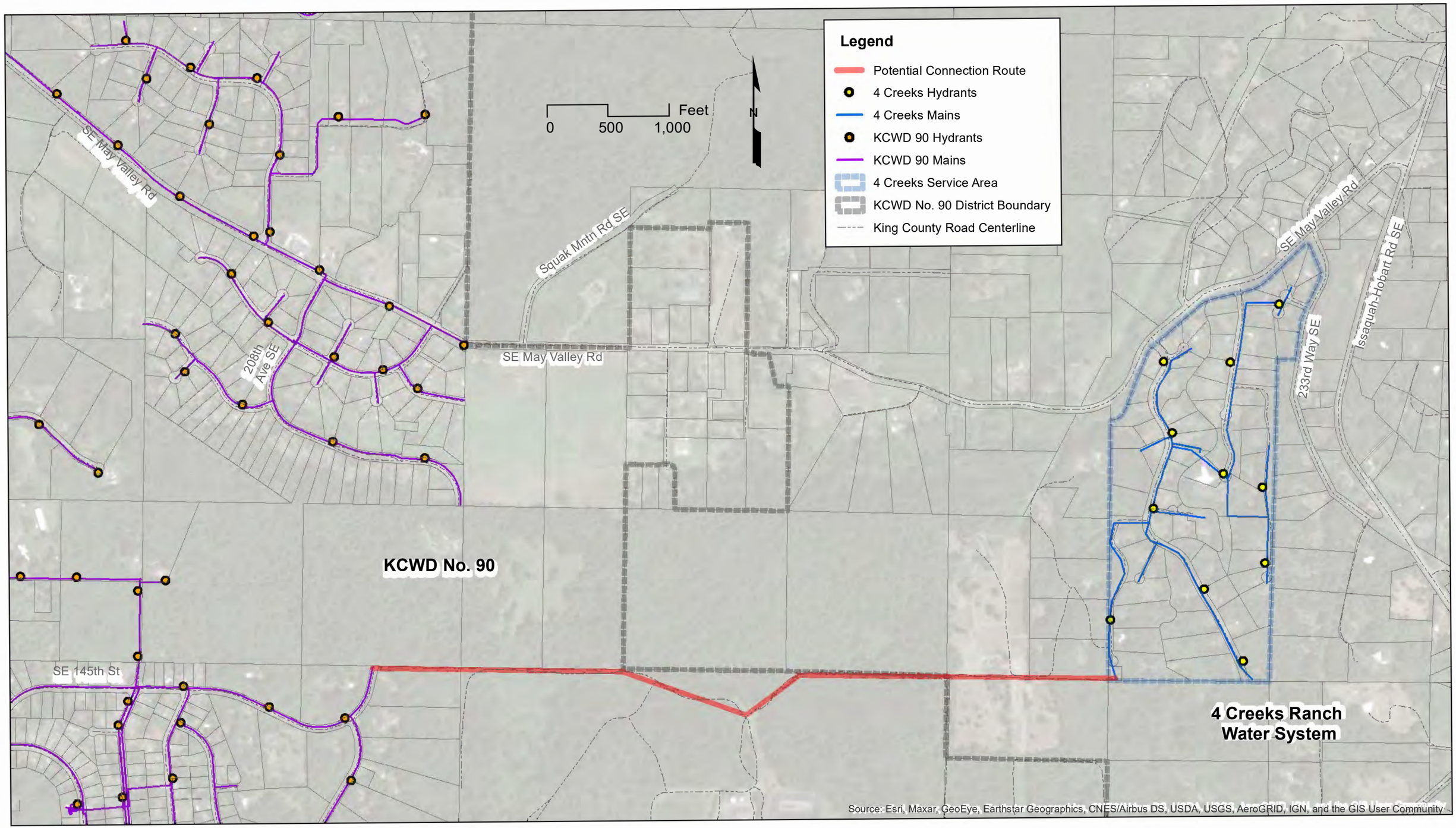
If the water systems are intertied, and KCWD90 intends to utilize the existing FCR well, then chlorination equipment and manganese removal treatment will be required.



King County Water District No. 90

Figure 3 - May Valley Connection Route

Four Creeks Feasibility Study



King County Water District No. 90

Figure 4 - Cedar Hills Connection Route

Four Creeks Feasibility Study

King County Water District #90

Annexation

KCWD90 Boundary

Four Creeks

FCR Water System

FIGURE 5

POTENTIAL WATER SERVICE ANNEXATION AREA

FOUR CREEKS FEASABILITY REPORT

0 0.25 0.5 mi

Spatial Reference:
NAD83 / Washington North (ftUS)

5. Cost Estimate

This report has outlined three different options for KCWD90 to takeover operations of the FCR water system. The costs associated with each are outlined below.

5.1. Management Agreement

The major item is the creation and implementation of an Operating agreement. This includes the time and effort to create the document(s), as well as any costs associated with ending the current SMA agreement that FCR has in place with NW Water Systems. This cost is estimated to be less than $10,000.

5.2. Organizational Consolidation

If KCWD90 were to proceed with consolidation in either form, they would need to proceed with WA-Dept. of Health (DOH) and King County Utilities Technical Review Committee (UTRC) submittals. The most efficient method would be to incorporate the service area revisions into a planned WSP update. However, in order to identify the magnitude of costs related directly to FCR and the service area expansion, this report will view the work as a stand-alone amendment. This would include an amendment to the current WSP currently filed with the DOH. This amendment would need to address the additional service area, water right concerns, well information, and equipment.

The KCWD90 Comprehensive Water System plan would need to be updated (amended) to include the additional FCR service area either as an island or as a broader water service area extension. In an “Island” configuration the FCR service area would become part of the KCWD90 service area, but would remain physically separated from each other. Amending multiple sections of the comprehensive plan to include this change would require substantial time and effort. The cost to amend the existing comprehensive plan is estimated at $60,000.

Ideally the water system plan amendment and approvals should happen before the actual annexations. This will allow for all neighboring public water system providers to review and comment on the proposed Future Service Area (Planning Area) and ensure that there are no conflicts. This exercise will also help KCWD90 shape the future eastward limits and identify logical blocks of area for potential annexation. A specific estimate related to annexation has not been prepared due to the large

number of variables. We recommend a place holder budget of at least $50,000 be considered.

Currently, many aspects of the FCR system are located on private property with multiple water mains traveling through residential parcels. The extent of easements in the area is unclear and the KCWD90 Comprehensive Plan states that property owners are to grant easements in order to maintain existing infrastructure. An investigation and survey of the service area would need to be performed in order to confirm and outline any existing or required easements. This could also mean that more easements are required. It is estimated that the cost to locate or create all required easements would be approximately $15,000.

5.3. Direct Connection

A direct or physical connection would include all the costs involved in the Organizational Consolidation with the addition of the costs listed below.

The comprehensive plan will need to be updated in the same fashion as noted above. However, with the direct connection KCWD90 could also incorporate the area between the two systems into the expanded KCWD90 service area. This would involve a larger amendment to the comprehensive plan depending on how KCWD90 plans on incorporating the expanded service area. It is estimated that this would involve an additional $45,000 worth of work.

In order to physically connect the two systems, approximately 5,700 LF of new water main would need to be installed. If this water main were to be installed through the KC ROW along May Valley Road the cost of this project would be mostly dependent on the level of asphalt and ground restoration that is required. It is estimated that the cost of this construction project would be approximately $300 per foot, or $1.7 million.

Preliminary Cost Summary				
	As T&M Agreement	Organizational Consolidation As “Island”	Organizational Consolidation as Service Area Expansion	Organizational Consolidation with Water Main Extension
Operating Agr.	$10,000			
WSP Amendment		$60,000	$60,000	$60,000
Easements		$15,000	$15,000	$15,000
Service Area Change			$45,000	$45,000
Annexation(s)		$20,000	$50,000	$50,000
Water Main Extension				$1,700,000
FCR Reservoir				$240,000
Total	**$10,000**	**$95,000**	**$170,000**	**$2,110,000**

6. Benefit Review

6.1. Consolidation Benefits for FCR

This consolidation would benefit the FCR community by transferring the responsibility of operating and maintaining the FCR water system to an organization best situated to handle such duties. Neither FCR nor NW Water Systems has an onsite staff presence. A larger entity such as KCWD90 has the experienced staff and equipment to promptly address most typical water distribution issues. KCWD90 can provide more cost-effective and knowledgeable service. KCWD90 already has a robust infrastructure with the ability, via a water system extension, to provide sufficient water to FCR.

Currently, FCR has not elected to treat their water. KCWD90 has noted that the FCR system has manganese in their water causing their clothes and bathroom fixtures to stain. Consolidation and physical connection would allow KCWD90 to help the FCR community address this problem. This consolidation could also create opportunities that may otherwise not be attainable if FCR were to remain independent, such as alternative funding and grants that would be conducive to improving the public health, welfare, and convenience of the system.

Currently, FCR's source well draws water from a subsurface aquifer. The FCR owner is concerned with the long-term viability of the aquifer, especially as the surrounding area continues to develop. If connected to the KCWD90 system, it would alleviate these concerns as KCWD90 would be able to supply water via their existing sources. Currently there are no known issues with the aquifer

The FCR system owner has stated that the community would prefer that the system was operated by KCWD90 rather than an SMA agreement. He also stated that the community is dissatisfied with the current SMA, as the community has had trouble organizing maintenance projects in the past. The operator believes this is because the FCR system is small and that contractors don't see enough monetary value in the system and that they would not run into these issues if KCWD90 were to take over operation of the system.

6.2. Consolidation Benefits for KCWD90

A successful consolidation of FCR could provide KCWD90 with approximately 60 new customers and potentially an expanded service area. By expanding their service area eastward, KCWD90 opens itself to more potential consolidations of

small water systems. The immediate area around FCR consists of small private water systems with a few small water districts to the southeast. By consolidating FCR, additional consolidation of nearby water districts and the acquisition of new customers becomes a less expensive endeavor. Additionally, consolidation would provide KCWD90 access to FCR's well as a potential low rate water source. As well as access to a potential future well location(s) to further enhance the KCWD90 system.

6.3. Disadvantages

The primary disadvantage are the costs involved. The majority of the benefit would be received by FCR and it is likely that for the consolidation to be successful the current KCWD90 ratepayers should only be liable to the extent that they benefit as well. This will require either a 3rd source of funding (grants, forgivable loans, Local Improvement District, etc.) be acquired or FCR will be assessed with significant rate increases to fund their local improvements.

7. Next Steps

After review of this Preliminary Engineering Report and thorough discussion, KCWD90 will decide whether to proceed with the consideration or not. The next tasks under the scope of the study grant would be to proceed with:

- **Task 2: Cultural Review.** Task includes preparation of cultural information for review.

- **Task 3: Land Acquisition.** Development of purchase agreements and land acquisition. (Likely revise to Easement identification and availability). FCR onsite easements could be a condition of a consolidation agreement. 3rd party private easements needed to support the Cedar Grove Route alternative will require refinement of the route location.

Following Task 3, KCWD90 would again review the information and determine if appropriate to proceed into:

- **Task 4: Public Meetings.** Tasks include preparing information and holding public meetings.

- **Task 5: Consolidation Feasibility Study Report.** Tasks include preparation of a report that summarizes information and recommends next steps.

Appendix A

Consolidation Feasibility Grant Scope
FCR WFI
FCR WUE
FCR Water Rights
FCR Well Report

ATTACHMENT I:
PROJECT SCOPE OF WORK

2020 Consolidation Feasibility Grant

Project Title: KCWD 90 and Four Creeks Consolidation Feasibility Study, 2020-3847

PURPOSE:

The purpose of this grant is to fund a preliminary engineering study, public outreach, cultural reviews, land acquisition, and feasibility study for Four Creeks Ranch water system (PWSID 22740) to consolidate with King County Water District (KCWD) 90 water system (PWSID 41150).

Background/General Information:

Four Creeks Ranch water system's well source exceeds the secondary maximum contaminant level for manganese and is interested in being permanently owned, operated, maintained and served by KCWD 90. The grant will allow both water systems to better understand the costs associated with permanently consolidating both water systems. Project activities include preliminary engineering study, public outreach, cultural review, land acquisition, and feasibility study.

Funding for this project will not be used for any construction or ground disturbing activities.

Contract Administration:

The project's scope of work is comprised of the following activities:

TASK/ACTIVITY:	DELIVERABLES:	ESTIMATED DUE DATE:
Task 1: Preliminary Engineering Report. Tasks include assessing existing infrastructure, identification of infrastructure improvements, and cost estimates.	Preliminary engineering report that includes assessment of existing infrastructure, identification of improvements, and cost estimate of improvements. Report to be reviewed and approved by Northwest Regional Office Drinking Water staff.	March 1, 2021
Task 2: Cultural Review. Task includes preparation of cultural information for review.	Cultural review information to be prepared and submitted to DWSRF Cultural and Environmental Program Specialist (Scott Kugel) for review and consultation.	May 1, 2021
Task 3: Land Acquisition. Development of purchase agreements and land acquisition.	Invoices for legal services to develop purchase agreements and executed purchase agreement submitted to DOH contract manager for review.	May 1, 2021
Task 4: Public Meetings. Tasks include preparing information and holding public meetings.	Copy of public meeting minutes for any public outreach event must be provided to the DOH contract manager for review.	August 1, 2021
Task 5: Consolidation Feasibility Study Report. Tasks include preparation of a report that summarizes information and recommends next steps.	Report with information on costs and recommendations to be submitted to Northwest Regional Office Drinking Water staff for review and approval.	October 1, 2021
	Submit quarterly reports to Dennis Hewitt. The quarterly progress reports should document project accomplishments, existing and potential problem areas, suggestions for improvements, and any desired outcomes achieved. Reports should be a few paragraphs long with sufficient	

	detail for DOH to understand the relative progress of the project since the last reporting period. The last quarterly report serves as the final report and should include summary information about the project. Quarterly reports are due the last working day of each quarter.	
PAYMENT:	DOH will provide reimbursement to KCWD 90 based on approval of quarterly reports and required deliverables. KCWD 90 will provide an hourly accounting of time spent for each task in support of invoice. The contractor is responsible for tracking all project expenditures as related to this contract, and for maintaining these records. DOH will withhold 10 percent of the total funding amount ($3,000) until the project is successfully completed and all deliverables are received and approved by DOH.	
Total Consideration for this contract not to exceed:		**$30,000**

The project will be considered complete when all the activities identified in the above scope of work are complete.

Project Performance Measures:

- Preliminary engineering report with Northwest Regional Office of Drinking Water approval
- Meeting minutes for any public outreach event
- Cultural review information submitted to DWSRF Cultural and Environmental Program Specialist for review and consultation
- Purchase agreement
- Feasibility study with Northwest Regional Office of Drinking Water approval

Project End Date: 07/01/2022. All deliverables need to be submitted by 06/30/2022 for review and approval. Work performed after 06/30/2022 is not eligible for reimbursement.

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health

ONE FORM PER SYSTEM

Quarter: 2
Updated: 11/05/2020
Printed: 1/6/2021
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
22740 4	FOUR CREEKS RANCH WATER SYSTEM	KING	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

KEVIN R. ODEGARD [OPERATIONS SUPERVISO]
PO BOX 123
PORT ORCHARD, WA 98366

7. OWNER NAME & MAILING ADDRESS

FOUR CREEKS HOMEOWNERS ASSOC. PRESIDENT
DONALD W. CAMPBELL
1420 NE GILMAN BLVD #2825
ISSAQUAH, WA 98027

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 7245 BETHEL-BURLEY RD SE
CITY PORT ORCHARD STATE WA ZIP 98366

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone: (360) 876-0958 x113
Primary Contact Mobile/Cell Phone: (253) 377-1865
Primary Contact Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 876-4196 E-mail: xxxxxxxxxxxxxxxxxxx

10. OWNER CONTACT INFORMATION

Owner Daytime Phone: (425) 391-3599
Owner Mobile/Cell Phone: (425) 837-0313
Owner Evening Phone:
Fax: E-mail: xxxxxxxxxxxxxxxxxxx

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☐ Owned and Managed
- ☒ Managed Only
- ☐ Owned Only

SMA NAME: Northwest Water Systems, Inc. SMA Number: 119

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☒ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☐ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

55,248

15	16	17	18									19			20	21					22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT					DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	4 Creeks Ranch Well AFF848		X									X			Y	X						133	90	NW SW	15	23N	06E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
22740 4	FOUR CREEKS RANCH WATER SYSTEM	KING	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		60	66
A. Full Time Single Family Residences (Occupied 180 days or more per year)	60		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		60	66

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 150

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Date Submitted: 6/19/2020

Water Use Efficiency
Annual Performance Report - 2019

WS Name: FOUR CREEKS RANCH WATER SYSTEM

Water System ID# : 22740 WS County: KING

Report submitted by: *Savannah Lyles*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not 100% metered – Did you submit a meter installation plan to DOH? No

Within your meter installation plan, what date did you commit to completing meter installation?

Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period *03/11/2019* To *03/13/2020*

Incomplete or missing data for the year? *Yes*

If yes, explain:

we only have production data

Total Water Produced & Purchased (TP) – Annual volume gallons	*6,552,330*	gallons	
Authorized Consumption (AC) – Annual Volume in gallons	*6,552,330*	gallons	
Distribution System Leakage – Annual Volume TP – AC		gallons	
Distribution System Leakage – DSL = [(TP – AC) / TP] x 100 %	*0.0 %*		
3-year annual average - %	*0.0 %*		*2017, 2018, 2019*

Goal-Setting Information:

Enter the date of most recent public forum to establish WUE goal: *03/20/2013*

Has goal been changed since last performance report? *No*

Note: Customer goal must be re-established every 6 years through a public process.

Customer WUE Goal (Demand Side):

2% reduction in consumption in 4yrs. Goal will be continued for 2014. Continue to communicate water conservation and discuss with community at annual meeting on 3/31/14.

Customer (Demand Side) Goal Progress:

Additional Information Regarding Supply and Demand Side WUE Efforts

Describe Progress in Reaching Goals:

- Estimate how much water you saved.
- Report progress toward meeting goals within your established timeframe.
- Identify any WUE measures you are currently implementing.
- If you established a goal to maintain a historic level (such as maintaining daily consumption at 65 gallons per person per day for the next two years) you must explain why you are unable to reduce water use below that level.

The following questions will help DOH better understand water usage, water resources management and drought response. The data will be used to provide technical assistance, not for regulatory purposes.

All questions are voluntary

Month	Date of Measurement	Static Water Level (feet below measuring point)	Dynamic Water Level (feet below measuring point)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Water level data:

Please provide the following information (if known) to help us better utilize the water level data.

Well tag Id number:

Well depth:

Water level accuracy (within 0.01 ft < 1 ft ~ 1 ft)

Completion type (e.g., cased open interval, cased open-ended, cased open-ended with perforations, etc…)

Location coordinates (latitude, longitude) and accuracy of the coordinates (< 1ft, ~1ft, >1000ft)

Water level parameter name (e.g. depth below measuring point, depth below top of casing, depth below ground surface)

Elevation of top of casing OR elevation of measuring point if different than top of casing (as specified in question 7)

Monthly/Seasonal Water Usage:

What was your maximum daily water demand for the previous year (in gallons per day)? _____

Month	Volume of Water Produced in gallons
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

Water shortage response:

Did you activate any level of water shortage response plan the previous year?

☐ Yes ☐ No ☐ There was no need to

If you activated a water shortage response plan the previous year, what level did you activate? (Check all that apply)

☐ Advisory Conservation ☐ Voluntary Conservation

☐ Mandatory Conservation ☐ Rationing ☐ Other

What factors caused your water shortage the previous year?

☐ Drought ☐ Fire ☐ Landslides ☐ Earthquakes

☐ Flooding ☐ Water Supply Limitations ☐ Other

Do not mail, fax, or email this report to DOH

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, a amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, a amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE
October 17, 1977	G1-22983	G1-22983P	G1-2

NAME
FOUR CREEKS FARM PARTNERSHIP LTD.

ADDRESS (STREET)	(CITY)	(STATE)
205 Columbia	Seattle	Washington

This is to certify that the herein named applicant has made proof to the satisfaction of the Departm of a right to the use of the public waters of the State of Washington as herein defined, and under subject to the provisions contained in the Permit issued by the Department of Ecology, and that use of said waters has been perfected in accordance with the laws of the State of Washington, an firmed by the Department of Ecology and entered of record as shown.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEA
	60	30.0

QUANTITY, TYPE OF USE, PERIOD OF USE
Community supply - continuously (60 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
710 feet south and 750 feet east of W¼ corner of Sec. 15

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COU
NW¼SW¼	15	23	6 E.	8	

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
52	Tract H	Four Creeks Ranch

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Sec. 15, T. 23 N., R. 6 E.W.M. described as follows:
That portion NW¼SW¼ and of the SW¼NW¼ lying southerly of Issaquah-Coalfield Ro
and that portion of the SE¼NW¼ lying southerly of said road and westerly of Ol
Issaquah-Hobert Road; and SW¼SW¼ of said Section 15.

An approved measuring device shall be installed and maintained in accordance
RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040.

All water wells constructed within the state shall meet the minimum standard
construction and maintenance as provided under RCW 18.104 (Washington Water
struction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Constr
and Maintenance of Water Wells).

Installation and maintenance of an access port as described in Ground Water
Bulletin No. 1 is required. An air line and gauge may be installed in addit
to the access port.

Flowing wells shall be so constructed and equipped with valves to ensure tha
of water can be completely stopped when not being used. Likewise, the well
so maintained as to prevent the waste of water through leaky casings, pipes,
valves, or pumps - either above or below land surface.

*The right to the use of the water aforesaid hereby confirmed is restricted to the lands o
described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.*

This certificate of water right is specifically subject to relinquishment for nonuse of water as p
90.14.180.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 23/6E-15M

Permit No. G1-22983

(1) OWNER: Name (UTN WA, INC.) Our Creek Farm Dev. Co. Address 37 Newport Key Bellevue, WA

(2) LOCATION OF WELL: County King — NW ¼ SW ¼ Sec. 15 T. 23 N., R. 6E W.M.

Bearing and distance from section or subdivision corner 710' S & 750' E of W¼ cor — SEC. 15.

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☒ Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ...
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 134 ft. Depth of completed well 133 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8" Diam. from +2 ft. to 133 ft.
Threaded ☐ ...." Diam. from .... ft. to .... ft.
Welded ☒ ...." Diam. from .... ft. to .... ft.

Perforations: Yes ☐ No ☒
Type of perforator used ....
SIZE of perforations .... in. by .... in.
.... perforations from .... ft. to .... ft.
.... perforations from .... ft. to .... ft.
.... perforations from .... ft. to .... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name ....
Type .... Model No. ....
Diam. .... Slot size .... from .... ft. to .... ft.
Diam. .... Slot size .... from .... ft. to .... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ....
Gravel placed from .... ft. to .... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? .... Depth of strata ....
Method of sealing strata off ....

(7) PUMP: Manufacturer's Name ....
Type: .... H.P. ....

(8) WATER LEVELS: Land-surface elevation above mean sea level... 95 ft.
Static level 0 ft. below top of well Date 10/28/77
Artesian pressure 10 lbs. per square inch Date 10/28/77
Artesian water is controlled by Cap & valve (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? ....
Yield: .... gal./min. with .... ft. drawdown after .... hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ....
Bailer test 60 gal./min. with 50 ft. drawdown after 4 hrs.
Artesian flow 30 g.p.m. Date 10/28/77
Temperature of water .... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown clay - sand Dry soft	0	6
Light Brown clay sand & gravel semi-hard	6	13
Light Brown clay cemented gravel Rocks	13	20
Light Brown clay Rocks hard	20	23
Gray clay, loose Gravel sand	23	64
Gray clay Large Rocks Gravel	64	67
Large Rocks Gravel sand/Gravel cemented	67	102
Gravel cemented & semi loose water	102	117
Gravel Sand ½ Brown Flowing water	117	133

Completion well in 3" & Down Rock & Gravel Flowing at 30 GPM. 10 PSI Pressure

Will be primarily two it test well as stated Well Phillips (initials) 12-18-79

RECEIVED
DEPARTMENT OF ECOLOGY
SEP 08 2016
WATER RESOURCES PROGRAM
NWRO

Work started Sept 19 77. Completed Oct 24, 19 77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME B E J Drilling Co (Person, firm, or corporation) (Type or print)

Address 9026 38th AVE S.W. Seattle 981..

[Signed] [signature] (Well Driller)

License No. 0071 Date Oct 31, 19 77

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356—OS—(Rev. 4-71).

DEPARTMENT OF ECOLOGY
State of Washington

Water Resources Program
Well Tagging Form

Unique Well ID Tag Number: AFF 848

Use this form ONLY if an Water Well Report IS FOUND
Attach the original well report to this form

If a *Water Well Report* is **not** available contact the Well Construction and Licensing Office at wclo@ecy.wa.gov or 360-407-6650 and request a *Water Well Report for an Existing Well* form.

Well Ownership

First name	Last name	
Four Creeks Home Owners Association	Lynn Martinet, Treasurer	
Street Address 22937 SE 139th Court		
City Issaquah	State WA	Zip Code 98027

Location of Well *** Township, Range, and Section is required.**

Well Address 13734 229th Dr SE, Lot 48 Four Creeks Ranch				
City Issaquah			County King	
¼ - ¼ NW	¼ SW	Township 23N	Range 6 ☒ E or ☐ W	Section 15
Latitude	Degrees 47		Minutes 28	Seconds 41.7 N
Longitude	Degrees 122		Minutes 2	Seconds 2.13 W
Elevation at land surface 240 ☒ feet ☐ meters *(check one)*				
Tax Parcel Number 2616800480				

Well Characteristics

Location of Well Identification Tag
Strapped around well casing

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Scale 1:24,000 (1" = 2,000')

Indicate the location of the well within the Section by drawing a dot at that point

Section "M"

Comments: _____

The Department of Ecology does NOT Warranty the Data and/or the information on this Well Report

White and First Copy with Department of Ecology
Yellow Copy — Owner's Copy
Pink Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

OWNER: Name Four Creek Farm Dev. Co. Address 3? Newport Way Bellevue, WA.

(2) LOCATION OF WELL: County King NW¼ SW¼ Sec. 15 T. 23 N., R. 6E W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 134 ft. Depth of completed well 133 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8" Diam. from +2 ft. to 133 ft.
Threaded ☐ Diam. from ..... ft. to ..... ft.
Welded ☒ Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level ..... ft.
Static level 0 ft. below top of well Date 10/29/77
Artesian pressure 10 lbs. per square inch Date 10/29/77
Artesian water is controlled by Cap & Valve (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 60 gal./min. with 50 ft. drawdown after 4 hrs.
Artesian flow 30 g.p.m. Date 10/29/77
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown clay - Sand Dry soft	0	5
Light Brown clay sand gravel Some hard	5	13
Light Brown clay Cemented gravel Rocks	13	20
Light Brown clay Rocks hard	20	23
Gray clay loose Gravel Sand	23	64
Gray clay Large Rocks Gravel	64	67
Large Rocks Gravel Sand Black Cement	67	102
Gravel Cemented Sand Loose water	102	117
Gravel Sand & Brown Flowing water	117	133
Completed well is 3" Brown		
Rock & Gravel Flowing at		
30 GPM. 10 PSI Pressure		

Work started Sept. 19 24 Completed Oct. 24 19 77

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME B & J Drilling Co
(Person, firm, or corporation) (Type or print)
Address 9026 38th Ave SW Seattle 98

[Signed] [illegible]
(Well Driller)

License No. 0071 Date Oct. 31, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

Form No. 7256—OS—(Rev. 6-71).