



**Whittier, Alaska**  
Gateway to Western Prince William Sound



**Whittier Well Field Upgrade Project  
Preliminary Engineering Report  
Prepared by City of Whittier, Alaska and CRW Engineering Group, Inc.  
Date February 4, 2025**



## 1. Project Planning

The City of Whittier is located at the head of the Passage Canal on Prince William Sound, about 58 miles southeast of Anchorage. The only land access is through the Anton Anderson Memorial Tunnel, a mixed-use road and rail tunnel. There is a harbor and a deep-water port used by cruise ships and the Alaska Marine Highway. Whittier is the Alaska Railroad Corporation's connection to rail systems in Canada and the lower 48 states by way of rail barge.

The City is within the Chugach Census Area, one of the two entities established in 2019 when the former Valdez–Cordova Census Area was dissolved. The population was 272 at the 2020 census, having increased from 220 in 2010. The median income for a household in the city was \$45,000 in 2019. The per capita income for the city was \$29,106.

Whittier's city government consists of a seven-member council with a mayor and six council members. The City has four key departments: Administration, Harbor, Public Works & Utilities, and Public Safety.

Whittier's main weather station receives just over 197 inches of precipitation in the average year. Whittier is located at the northern tip of the world's northernmost temperate rainforest, the Tongass. Whittier's annual average temperature is 41.1 °F, with the hottest month being July at 57.2 °F and the coldest month being January at 28.2 °F. Temperature extremes ranged from -29 °F on December 23, 1942, to 88 °F on July 23, 1966. Whittier's coldest temperatures typically fluctuate between 0 °F and 10 °F each year, so Whittier falls in USDA Plant Hardiness Zones 7a.

## 2. Existing Facilities

The City's existing water supply includes three public water wells, which at 80 years old are at the end of their useful life. See Figures 1 – 3 at the end of this document for location maps.

Well No. 1 (500 gpm), Well No. 2 (250 gpm), and No. 3 (230 gpm) were originally constructed by the military in the late 1940's and early 1950's and the well casings are undersized to accommodate new higher capacity well pumps. The wells were not constructed with surface seals, and it is suspected that they do not have well screens. Each well is installed inside a well house with concrete block construction, and the well houses are all failing and beginning to fall apart. If even one of the wells fails, it will impact the capability of the City to provide an adequate supply of potable water to the community. The existing well controls are not automated and must be manually operated daily. The system does not have any alarms to indicate either extreme water levels in the storage tank or well pump failure.

As part of the Well Replacement Project, the City installed two new exploratory wells (Well A and Well B) in 2020 for an aquifer pumping test and evaluation. These exploratory wells were drilled and developed with 12-inch casings and stainless steel well screens so they could potentially be utilized for the well field upgrade project. The top 20 feet of the wells were installed with a surface seal. Well A yielded a pumping rate of 750 gpm and Well B yielded a pumping rate of 500 gpm which together provide sufficient water supply to meet the growing needs of the community. Appendix C provides a summary of the aquifer pumping test and evaluation (Aquifer Evaluation Report, Shannon & Wilson, December 2020).

### 3. Need for Project

This project is necessary to provide an adequate water supply for the Whittier community. The project will benefit a total of 114 year-round occupied homes (114 Equivalent Dwelling Units - EDU's), and is required to meet Whittier's growing industrial base, including significant growth in seasonal cruise ship operations. Whittier currently receives more than 200,000 cruise ship visitors annually. The completion of a new cruise ship double-berthing facility in 2024 will add an additional 200,000 passengers through the community annually. The number of cruise ships calling in Whittier is expected to increase in the years ahead, putting further demands on the domestic water supply already at 90% capacity during the busy summer season. Without an adequate water supply, Whittier's seafood processing industry will not be able to expand its production during the fishing season.

### 4. Alternatives Considered

Three alternatives were considered for this project:

- A. Replace well pumps in existing wells; upgrade well houses; and install new controls.
- B. Construct two new wells; install well pumps; construct one new well house; install new controls.
- C. Do nothing.

The existing well casings, located inside the existing well houses, are undersized to accommodate new higher capacity well pumps. Additionally, the well casings were not

constructed with surface seals. It is not feasible to increase water supply to the community using the existing facilities that are at the end of their useful life. Therefore, Alternative A was dismissed and not considered further.

Alternative B provides the capacity and controls upgrades to satisfy the need for the project. This alternative will construct new facilities within the existing well field limits, eliminating the need for any new property or easements.

It is necessary to increase the capacity of the City's existing water supply and provide new controls for the water system. Alternative C was dismissed as it does not increase the capacity of the City's water supply and does not provide new system controls.

### 5. Selected Alternative B – Construct New Well Building, Well Pumps, and Controls

The design and permitting for selected Alternative B were completed in 2021. Appendix A provides the ADEC-approved Whittier Well Field Upgrade final sealed plans (December 2021) which were bid in January 2024. The two exploratory wells (Well A and Well B) installed in 2020 for the aquifer pumping test and evaluation were incorporated into the design of Alternative B. They were constructed in accordance with ADEC requirements for municipal water wells.

Permits obtained for the project include the ADEC Approval to Construct and a State Fire Marshall certificate. In addition, the City has completed the EPA Categorical Exclusion checklist and the National Historic Preservation Act Section 106 consultation. Pursuant to 36 CFR 800.4(d)(1) implementing regulations of Section 106 of the Historic Preservation Act, the City of Whittier, in partnership with local tribes, finds that no historic properties are affected by the proposed project. The area of potential effects for the project encompasses approximately seven acres and includes a 200-foot radius around each of the existing wells. There are seven known cultural resources within a 0.5-mile radius of the project area; three are eligible for listing on the National Register of Historic Places and three are not eligible. None of the cultural resources are within the project's area of potential effects. The proposed project does not impact cultural resources.

Construction of the project was delayed pending funding; construction cost was estimated to be \$1.23 million. The project was bid in January 2024 and the low bidder for the project was \$2.58 million. The project received four bids, but due to the bidding climate at the time, the lowest of the four bids was significantly higher than the available funding.

The January 2024 bid documents (plans, specifications, addenda, bid results) are currently available on the City of Whittier website <https://www.whittieralaska.gov/rfps/> under the title INVITATION TO BID FOR WHITTIER WELL FIELD UPGRADE.

## 6. Proposed Project

The Well Field Upgrade project will construct a new well building, well pumps, water main piping, and well controls. The well pumps will be installed in new wells (Well A and Well B) drilled and developed in December 2020 at the existing well field. New 750 gpm and 500 gpm well pumps will be installed and connected to existing manifold piping. Water from the wells will be routed through the new 30-foot x 30-foot well building to meter and sample water from each well in accordance with ADEC requirements. The City will permanently install an existing standby generator in the building, and the building will be configured to provide space for a future chlorination system. The building will house the controls necessary to monitor water demand and to control when the pumps operate, in order to meet water demand. The controls will be configured to allow the lead well to be rotated among the two new wells and automatically start the second well if required. Each well will have a pressure transducer to monitor and record drawdown of the aquifer in real time, providing continuous data of the aquifer's performance. Alarms will be provided for low reservoir level, high reservoir (overflow) level, and well pump failure. Controls and piping will be installed to accommodate a future third municipal well. The existing wells will be abandoned in accordance with ADEC regulations, and the existing failing well house structures will be demolished.

The project scope includes the following components. Appendix B - 35% Design & Technical Memo (CRW Engineering Group, April 2021) provides additional detail (note – 35% design sheets removed to reduce file size).

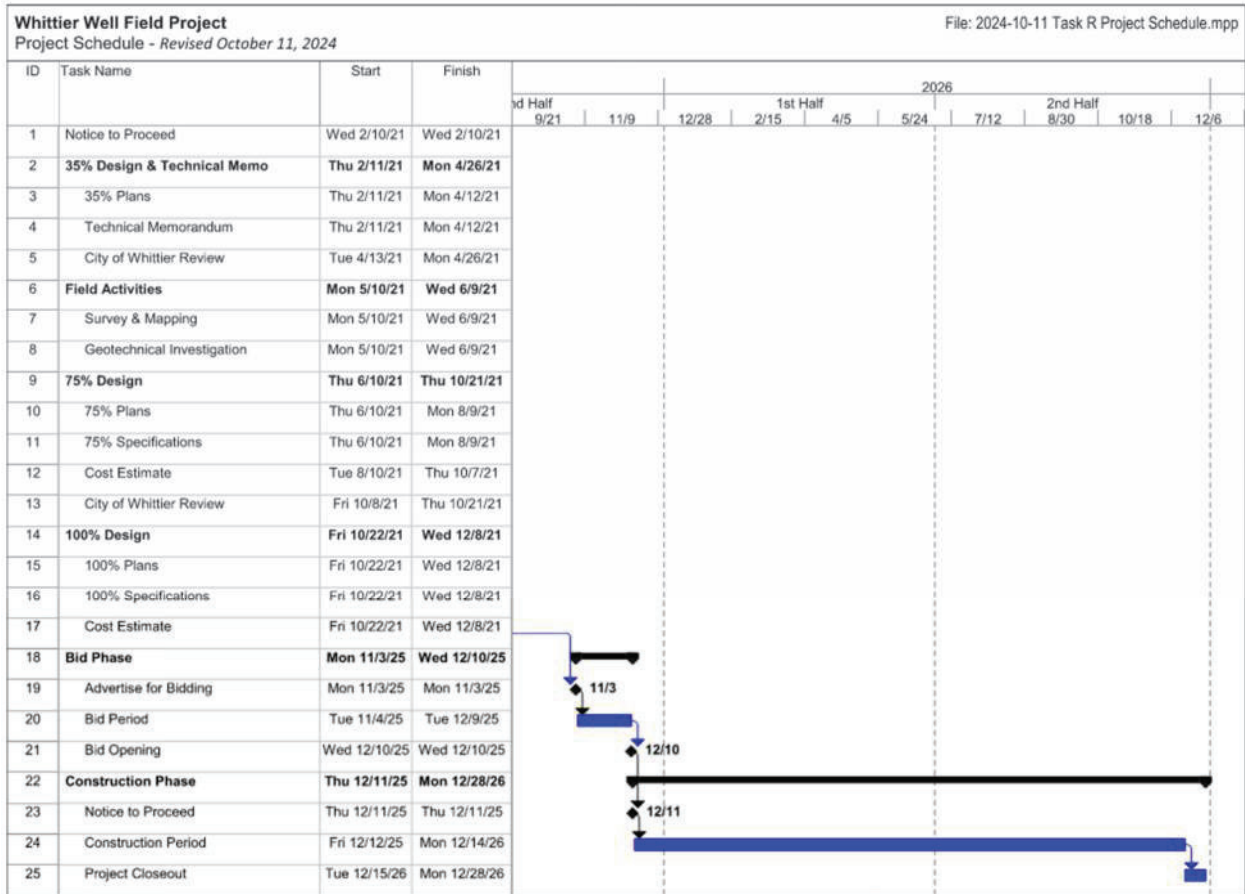
- Well Building – 30-foot x 30-foot CMU block building with concrete slab on grade floor. Water from the new wells will be routed into the building where it will be metered prior to entering the water distribution system as required by ADEC. Controls for operating the wells will be housed in the well building along with an existing generator installed in the building to provide emergency power for the wells. The well building will be located east of and adjacent to the existing Well House No. 3.
- Well Pumps – Pumps will be sized and selected for the desired production of 500 gpm and 750 gpm from each well. Electrical and controls will be routed back to the well building.
- Water Main Piping – Water from the wells will be routed to the well building through new ductile iron pipe water mains. From the well building, piping will connect to the existing water distribution system near existing Well House No. 2. Piping will be installed to accommodate a future third well.
- Controls – Controls for the new wells will be housed in the well building. The controls will allow the well pumps to be operated in either automatic mode or hand mode (manually). Operation of the wells will be determined by the level of water in the City reservoir; the controls will call for either one or both pumps to operate until the

reservoir is full, then the wells will be shut off. After the level of water has dropped to a predetermined level, the controls will call for either one or both wells to start. Initially, the new controls will also operate existing Well House No. 1 as backup. The controls will accommodate a future third well.

- Existing Well Houses – The existing well houses will be demolished once the new facilities are constructed and operational. Construction will be sequenced to ensure the existing well houses are not demolished until the new facilities have been commissioned. Well House No. 2 and No. 3 will be demolished as soon as practical. Well House No. 1 will initially be kept online as a backup.

Project Schedule

The project schedule has been revised to address the need to rebid the project.



Project Cost

The rough order of magnitude (ROM) cost to construct the Well Field Upgrade project is \$5.31 million (construction cost, 20% construction contingency, City administration, and construction management). This cost is based on bid prices obtained in February 2024 when the project was put out for bids but there were not adequate funds to award a contract.

**City of Whittier, Alaska**

**Well Field Upgrade**

*Rough Order of Magnitude Cost - Year 2026*

**Construction**

1. Electric & Gas Building Services	\$40,000
2. Well Building, Water Mains & Controls	\$3,312,000
3. Well Pumps (2 Installed + Spare)	\$278,400
4. Decommision Well No. 2	\$30,000
5. Decommision Well No. 3	\$33,600
<b>Construction Subtotal</b>	<b>\$3,690,000</b>
<b>Construction Contingency (20%)</b>	<b>\$740,000</b>
<b>Construction Total</b>	<b>\$4,430,000</b>

**Administration/Construction Management**

<b>City of Whittier Administration (5%)</b>	<b>\$220,000</b>
<b>Construction Management (15%)</b>	<b>\$660,000</b>
<b>Project Administration Total</b>	<b>\$880,000</b>

<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$5,310,000</b>
<b>PROJECT COST PER EDU (114 EDU'S)</b>	<b>\$46,600</b>

## Project Figures

The well field location and the conceptual layout of the proposed project components are shown in the following figures. The project location is the site of the existing well field for which the City has a long-term permit issued by the landowner, the Alaska Railroad Corporation.



**Whittier Well Field Upgrade Project  
Figure 1. Project Area**



**Whittier Well Field Upgrade Project**  
**Figure 2. Area of Potential Effect**



**Whittier Well Field Upgrade Project  
Figure 3. Conceptual Layout (Google Image)**

## 7. Conclusions and Recommendations

The project has been designed, permitted, and is shovel ready. It is recommended that the City seek and obtain additional funding and rebid the project for construction.