

**Agency: Commerce, Community and Economic Development**

**Grants to Municipalities (AS 37.05.315)**

**Grant Recipient: Egegik**

**Project Title:**

**Project Type:** Remodel, Reconstruction and Upgrades

# Egegik - Design and Control for a New Class A Well

**State Funding Requested: \$100,000**

**House District: 37 / S**

One-Time Need

**Brief Project Description:**

The design and construction of a new Class A water well, piping and controls to incorporate it into the City's treatment and distribution system in order to meet the community's summer water demand.

**Funding Plan:**

**Total Cost of Project: \$225,000**

	<u>Funding Secured</u>		<u>Other Pending Requests</u>		<u>Anticipated Future Need</u>	
	<i>Amount</i>	<i>FY</i>	<i>Amount</i>	<i>FY</i>	<i>Amount</i>	<i>FY</i>
Local Funds	\$125,000				\$50,000	
<b>Total</b>	<b>\$125,000</b>				<b>\$50,000</b>	

**Detailed Project Description and Justification:**

A site would be selected for a new (additional) Class A water well. The well would be drilled and piped into our existing water treatment and distribution system. Controls would be added into the existing system to incorporate the operation of the additional well. During the past two summer fishing seasons the City has come dangerously close to running out of water as demand has exceeded our existing pumping capability. The existing wells can produce approximately 72,000 gallons per day. This past summer our 100,000 gallon storage tank came within 2,000 gallons of being empty. This resulted in a decision to reduce the system wide water pressure and the resulting loss of water service to a number of households. With only 2,000 gallons of water on hand, the City also has virtually no fire fighting capability using city fire hydrants.

**Project Timeline:**

The City has already entered into a contract with CRW Engineering for the siting and design of the new well and a well site has been selected. It is hoped that the well could be drilled and the piping and controls installed next Spring and that the well would be online for next summer's fishing season. Approximately \$40,000 of expenditures will occur prior to construction and the balance of the construction costs happening next Spring/Summer.

**Entity Responsible for the Ongoing Operation and Maintenance of this Project:**

City of Egegik

*For use by Co-chair Staff Only:*

\$100,000  
Approved

**Grant Recipient Contact Information:**

Name:	Don Strand
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Has this project been through a public review process at the local level and is it a community priority?  Yes  No

# TECHNICAL MEMORANDUM



## **CRW Engineering Group, LLC**

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[www.crweng.com](http://www.crweng.com)

**To:** City of Egegik  
**From:** CRW Engineering Group, LLC  
**Date:** October 2009  
**Re:** Siting and Design of a New Class A Well

CRW Engineering Group was retained by the City of Egegik to assist with the siting and design of a Class A water well. The well is needed to increase system capacity by 15 to 30 gallons per minute (gpm) for peak summer demands. This memo provides a brief review of the City's existing water system, identifies three potential well sites in the vicinity of the water treatment plant (WTP), and includes conceptual cost estimates for each of the options. It also includes recommendations for a new well site.

Following the City's review of this memo, and decision as to which well site to pursue, CRW will initiate the final design phase of the project. Design activities will include the preparation of all required drawings for permitting and construction, and will also include the preparation of procurement documents for well drilling services.

## **EXISTING FACILITIES**

### **Wells**

The existing water system is supplied by three wells designated Well No. 1 (also referred to as No. 34), Well No. 3 and Well No. 4. Well No. 1 is located on lot 4 of block 10, approximately 55 feet north of the WTP. Well Nos. 3 and 4 are located on lot 3 of Plat 99-8. The approximate locations of the wells are shown on Figure 1.

The capacity of each well is approximately 25 gpm. However, the combined capacity of all three wells is only about 50 gpm or roughly 72,000 gallons per day. Well Nos. 3 and 4 cannot be run simultaneously due to the close proximity of the two wells (approximately 50 feet apart) and the fact that they are powered from a single set of electrical contacts.

Water from the wells is pumped to the water treatment plant through two 2-inch water lines. The water lines are reportedly 4 to 8 feet deep and are of unknown construction. The water line between Well No. 1 and the WTP is about 60 feet in length. The water line that serves Well Nos. 3 and 4 is about 660 feet in length. The pumps in each well provide the head to pump the water through the treatment system and into an 8,000-gallon transfer tank.

### **Water Treatment System**

The primary components of the water treatment system include; three greensand filters, two chemical feed systems (potassium permanganate and chlorine) an inline static mixer, a 1000-gallon detention tank, and flow controls. A review of the individual components was performed to determine which if any of the components would need to be modified or replaced in order to increase system flows by 15 to 30 gpm. The components with the least capacity are the greensand filters which are rated for 25 gpm. Combined they have a capacity of 75 gpm which would limit the allowable increase in flow to 25 gpm. The other system components should be able to accommodate a flow of at least 75 gpm.

The other component in the WTP with limited capacity is the pumps that transfer water from the 8,000-gallon interior tank to the 100,000-gallon water storage tank. These pumps when operating together have sufficient capacity to handle an increase flow of 25 gpm but when run alone they do not. If it is desired to continue to operate the transfer pumps in the current prime/backup mode, then the pumps will need to be replaced with larger pumps. The 50 gpm flow control valve on the treated water supply line to the 100,000-gallon tank will also need to be adjusted or replaced.

### **WELL SITE SELECTION**

The first phase of the siting process included a preliminary review of existing data and development of criteria for the selection of potential well sites. Based on initial communications with the City, and the criteria listed below, seven potential sites were identified. The locations for each site are shown on Figure 1.

#### **Design Criteria**

- Within 1,500 feet of the WTP and preferably on City owned land
- At least 200 feet from any known contaminated sites
- At least 150 feet from existing sewer mains or other potential sources of contamination
- At least 200 feet from the City's existing wells

### Initial Evaluation of Potential Sites

A teleconference call to discuss the seven well sites with the Egegik City Council was conducted on September 10, 2009. A summary of the initial thoughts and concerns identified during the call is presented below:

Well Site No.	Concerns
1	Potential for contamination from Egegik Light and Power
2	Land ownership (property owned by Icicle Seafood) and steep slope down to School Lake
3	High traffic area but the site could be shift to the southeast to avoid traffic
4	Long distance to WTP, potential for contamination due to storage and repair of heavy equipment at the City shop
5	Widening of Airport Road is considered unlikely
6	Could restrict development of Lot 4
7	Relatively long distance to the WTP

Based on the above concerns, site Nos. 1, 3 and 5 were selected as the preferred locations for a new well. Site Nos. 2, 4 and 6 were eliminated from further consideration.

### Review of Existing Data

In addition to the review of well logs, as-built drawings and previous reports, a review of historic spills, contaminated sites, and water rights was also performed. A brief summary of the results from each of the data searches is described below.

#### *Fuel Spills*

Since 1995, there have been 15 reported fuel spills in the community. All but four of the spills occurred at a distance far enough from the selected well sites that there is little to no potential for contamination from the spills. The four spills that could potentially impact the sites include three at Egegik Light and Power, and one at the Tribal Building. The Egegik Light and Power spills are up gradient and within 400 ft of Well Site No. 1. The Tribal Building spill is closer to Well Site No. 3 (less than 300 feet), but the spill was relatively small (less than 50 gallons) and the majority of the fuel was reportedly recovered. A listing of all 15 spills is included in Appendix A, and the four closest spill sites are identified on Figure 2.

**Contaminated Sites**

According to the ADEC Contaminated Sites database there are four contaminated sites in the community. Three are considered open and one has been cleaned. A listing of the sites is shown in the following table.

Hazard ID	Site Name	Location	Status	File ID
1 1876	Icicle Seafood's Cannery	Egegik Waterfront, Egegik, AK 99579	Open	2543.38.002
2 2149	Egegik Light & Power	P.O. Box 109, Egegik, AK 99579	Open	2543.38.001
3 3204	Alaska General Seafood's Fish Camp	Mile 1, Cannery Row, Egegik, AK 99579	Cleanup Complete - Institutional Controls	2543.38.003
4 4378	Icicle Seafood's Spills	1 Cannery Road, Egegik, AK 99579	Open	2543.38.002

The Icicle Seafood's Cannery (formerly Woodbine Cannery) is located approximately 1200 feet north-northeast of Well Site No. 1. The Alaska General Seafood's Fish Camp is located approximately 1150 feet north of Well Site No. 1. The Egegik Light and Power Plant is located approximately 400 feet north of Well Site No. 1. All three sites are identified on Figure 2. The only contaminated site considered to be a potential threat to any of the well sites is the Egegik Light and Power site.

**Underground Storage Tanks**

According to the ADEC Underground Storage Tank Database, there are no known underground storage tanks in the community.

**Water Rights**

A review of the Alaska Department of Natural Resources Land Administration System database indicates that there are eight Water Rights cases in Egegik. A summary of the cases is shown in the following table. Detailed abstracts for each case are included in Appendix A. Only cases ADL46270, LAS10482, LAS11296 have the potential to result in a conflict with the well sites, and only Well Site No. 1. The City has the water rights for Well No. 1, but no rights were found for Well Nos. 3 and 4. Areas with established water rights are identified on Figure 2.

### Egegik Water Rights

DNR Case No.	Location	Owner
ADL 46270	USS Nos. 485 and 551	Icicle Seafoods, Inc.
ADL 46271	Portion of Evans Creek within parcel B, USS No. 2482	Kanaway Seafoods, Inc
ADL 46271	Parcel A, ATS No. 86	Kanaway Seafoods, Inc
LAS 10482	Block 15, Tract A, USS 4900	Nick Abalama, SR
LAS 11296	Lot 10, Block 8, Tract A, USS 4900	Paul P Boskoffsky
LAS 11431	Parcels A, C and D, USS No. 892	Kanaway Seafoods, Inc
LAS 11605	Lot 2 & 3, Block 16, Tract B, USS 4900	Stephen J Furman
LAS 14313	Lots 5 and 7, Block 10, Tract A, USS 4900	City of Egegik
LAS 22270	Lot 1, USS 9136	Vern Tomlinson
TWUP A2007-60	Sec 1, T 23S, R50W, 5.M. Egegik AK	BGES, Inc.

### ALTERNATIVE WELL SITES

The following sections provide a brief description, and a listing of concerns and advantages of each alternative. The proposed raw water transmission line from each well to the WTP would be 2-inch SDR11 HDPE pipe. The pipeline would be buried at depth of 8 feet to ensure adequate frost protection. Conceptual alignments for each of the transmission lines are shown on Figure 3.

#### Well Site No. 1

##### Description

Well site No. 1 is located within the southeast corner of USS No. 2022. According to the City of Egegik, the City purchased the southern portion of this property and is in the process of constructing a community center on the western portion of the lot.

The length of the proposed water transmission line is 560 feet. The alignment would run south from the well site to the WTP, parallel to an existing water main. There are 3 utility crossings along the proposed alignment: 2 water lines and one buried electric line. No easements are necessary since the transmission line would be located within an existing road right-of way.

### Concerns

The Egegik Light and Power property is a known contaminated site. The area has yet to be fully characterized so the extent of contamination is unknown. Although the site is almost 400 feet from Well Site No. 1, the site drains toward the well site and as such there is the potential for contamination. A second concern with Well Site No. 1 is the established water rights for School Lake and the Abalama property. Both are in close proximity to the well and as such the potential for water rights conflicts is a possibility. The third and final concern with the site is the existence of a sewer main cleanout within 150 feet of the site. The 18 AAC 80 Drinking Water regulations specify a minimum separation distance of 200 feet between a Class A public water systems and sewer manholes, lift stations and cleanouts. It may be possible to get a waiver from this requirement, but doing so will likely require additional water quality monitoring.

### Advantages

A well at this site would likely yield plenty of water and is unlikely to have any effect on the City's other wells. The site is also relative close to the WTP.

## Site No. 3

### Description

Well site No. 3 is located on USS No. 4900, Tract C, adjacent to the northwest corner of USS No. 4900, lot 2 of block 13. The initial location for this site (as shown on Figure 1) was shifted to the south to avoid the established travel way.

The length of the proposed water transmission line is 315 feet. The alignment would run west from the well site to the WTP. Only one utility crossing would be required: a water line near the WTP. No easements are necessary since transmission line will be located within existing rights-of way and lot 1 of Plat 99-8 which is owned by the City.

### Concerns

A wastewater treatment system (septic tank and leach field) on USS No. 4900, lot 3 of block 13 is within 200 feet of the proposed well. The system has likely been dormant since 2002 when a sewer main was installed along Delta Street but it will need to be decommissioned or a waiver of separation distances be filed. Decommissioning would entail removal of the tank, associated piping, and the leak field. A waiver could be filed but considering the relative ease of removing the system it is recommended that the system be decommissioned.

Advantages

The well site is the closest to the WTP and installation of the transmission line would only require one utility crossing. This alternative would also be the least expensive to construct.

Site No. 5

Description

Well site No. 5 is located on USS No. 4900, Tract C, within the right-of-way for Airport Road, and just west of USS No. 4900, lot 8 of block 13. The well is located in a vegetated area outside of the travel way.

The length of the proposed water transmission line to the WTP is 935 feet. The alignment would run northwest, parallel to the Airport Road and then westward to the WTP. Two utility crossings would be required: one water line near the WTP and one buried electric line. No easements would be necessary since the transmission line would be located within existing rights-of way and lot 1 of Plat 99-8 which is owned by the City.

An alternative to running a new standalone water line from the well to the WTP would be to connect the pipeline to the existing 2-inch water line between Well No.4 and the WTP. This would reduce the length of the new water line by approximately 500 feet, but would require a larger pump in the new well. The existing pumps in Well Nos. 3 and 4 might also need to be replaced.

Concerns

The existing well on USS No. 4900, lot 7 of block 13 should be properly sealed or abandoned to limit the potential for future contamination.

Advantages

No known sources of contamination within 200 feet of the well. No known water rights within 300 feet of the well.

**CONSTRUCTION COST ESTIMATES**

Preliminary cost estimates were developed with cost data from recently completed projects, published literature, and discussions with drilling contractors in the region. Assumptions made in preparing the estimates include;

- Local equipment, with the exception of a drill rig, would be used to construct the project.
- Native materials excavated from the pipe trench would be used to backfill the trench.
- The work, with the exception of well drilling, would be performed by a local crew of under the direction of an out of town superintendent.
- Competitive bids would be sought for well drilling services.
- Spring / summer 2010 construction
- Mobilization of required equipment and materials by barge
- 20 percent contingency

Cost estimate summaries for the three well sites are provided in the following tables:

*Well Site No. 1*

Item Description	Qty	Unit	Unit Cost (\$)	Total Cost (\$)
Mobe & Demobe	1	LS	25,000	25,000
Heavy Equipment Rental & Fuel	1	LS	10,000	10,000
Furnish & Install 2" HDPE Pipe	560	LF	85	47,600
WTP Connection	1	LS	2,500	2,500
Electrical Conduit / Cable	560	LF	50	28,000
Furnish Pump and Complete Well	1	EA	7,500	7,500
Pipe Bollards	3	EA	500	1,500
Drill and Develop Class A Well	1	EA	50,000	50,000
Furnish & Install Well Pump Control Panel	1	EA	15,000	15,000
<b>Construction Cost Subtotal</b>				<b>187,100</b>
Contingency (20%)				37,420
<b>Total Costs (with contingency)</b>				<b>225,000</b>

**Well Site No. 3**

Item Description	Qty	Unit	Unit Cost (\$)	Total Cost (\$)
Mobe & Demobe	1	LS	25,000	25,000
Heavy Equipment Rental & Fuel	1	LS	8,000	8,000
Furnish & Install 2" HDPE Pipe	315	LF	85	26,775
WTP Connection	1	LS	2,500	2,500
Electrical Conduit / Cable	315	LF	50	15,750
Remove Existing Septic Tank and Leach Field	1	LS	5,000	5,000
Furnish Pump and Complete Well	1	EA	7,500	7,500
Pipe Bollards	3	EA	500	1,500
Drill and develop Class A Well	1	EA	50,000	50,000
Furnish & Install Well Pump Control Panel	1	EA	15,000	15,000
<b>Construction Cost Subtotal</b>				<b>157,025</b>
Contingency (20%)				31,405
<b>Total Costs (with contingency)</b>				<b>188,000</b>

**Well Site No. 5**

Item Description	Qty	Unit	Unit Cost (\$)	Total Cost (\$)
Mobe & Demobe	1	LS	25,000	25,000
Heavy Equipment Rental & Fuel	1	LS	12,000	12,000
Furnish & Install 2" HDPE Pipe	935	LF	85	79,475
WTP Connection	1	LS	2,500	2,500
Electrical Conduit / Cable	935	LF	50	46,750
Abandon Well	1	LS	5,000	5,000
Furnish Pump and Complete Well	1	EA	7,500	7,500
Pipe Bollards	3	EA	500	1,500
Drill and develop Class A Well	1	EA	50,000	50,000
Furnish & Install Well Pump Control Panel	1	EA	15,000	15,000
<b>Construction Cost Subtotal</b>				<b>244,725</b>
Contingency (20%)				48,945
<b>Total Costs (with contingency)</b>				<b>294,000</b>

**Well Site No. 5 with Alternative Pipeline Alignment (connection to Well No. 4 waterline)**

Item Description	Qty	Unit	Unit Cost (\$)	Total Cost (\$)
Mobe & Demobe	1	LS	25,000	25,000
Heavy Equipment Rental & Fuel	1	LS	10,000	10,000
Furnish & Install 2" HDPE Pipe	440	LF	85	37,400
WTP Connection	0	LS	2,500	-
Electrical Conduit / Cable	935	LF	50	46,750
Seal or Abandon Existing Adjacent Water Well	1	LS	3,500	3,500
Furnish Pump and Complete Well	1	EA	7,500	7,500
Pipe Bollards	3	EA	500	1,500
Drill and develop Class A Well	1	EA	50,000	50,000
Furnish & Install Well Pump Control Panel	1	EA	15,000	15,000
<b>Construction Cost Subtotal</b>				<b>196,650</b>
Contingency (20%)				39,330
<b>Total Costs (with contingency)</b>				<b>236,000</b>

**RECOMMENDATIONS**

Based on the review of existing data and comparison of the concerns, advantages and costs of each alternative, it is recommended that Site No. 3 be selected for the installation of a new Class A well. This site is the least expensive alternative and there are no known fuel spills or contaminated sites within 200 feet of the site. It would also require the shortest water line and fewest utility crossing to complete the well.

The new well should be design for a minimum flow of 25 gpm, be terminated at least 18 inch above grade, and be protect from vehicles with three or more pipe bollard. The ground surface surrounding the well should be graded to drain away from the well and the first 20 feet below grade should be sealed with a continuous seal of watertight cement grout, sealing clay or the equivalent to limit the migration of surface water along the casing.

It is also recommended that the City review its files to confirm whether or not an application for the water rights to Well Nos. 3 and 4 was ever submitted. If not, then an application should be prepared and submitted to the Alaska Department of Natural Resources at the same time or prior to drilling the new well.