





# CONTRACT CHANGE ORDER

Date:	5/8/19
Change Order No.:	<b>1</b>

Project Name:	Well Pump Replacement/Upgrades/Sampling Stations	Well 1R and Well 3R Rehabilitation
To (Contractor):	Holt Drilling	Location: Well Field

**Upon approval by the Owner, you are hereby requested to comply with the following changes to the contract plans and specifications:**

Item No.	Description of Changes - Quantities, Unit Prices, Reference to supplemental documentation	Estimated Quantity	Price	Pay Units	Contract Increase	Contract Decrease
#####	Remobilize/Demobilize (contract price)	\$ 1.00	\$ 2,800.00	LS	\$ 2,800.00	
#####	Move Between Wells (contract price)	\$ 10.00	\$ 350.00	HRS	\$ 3,500.00	
#####	Remove and Inspect Pumps (contract price)	\$ 15.00	\$ 350.00	HRS	\$ 5,250.00	
#####	Well Development (contract price)	\$ 38.25	\$ 350.00	HRS	\$ 13,387.50	
5	2/O Flat Jacket Wire*	1265	\$ 24.90	FT	\$ 31,498.50	
6	Reinstall Well Pumps to New Elevation, Splice Wire, and Modify Well Heads (contract price)	16	\$ 350.00	HRS	\$ 5,600.00	
7	2/O Splice Kits	2	\$ 85.00	EA	\$ 170.00	
8	New 6-Inch Galvanized Drop Pipe*	660	\$ 35.00	FT	\$ 23,100.00	
9	New 6-inch Check Valves	3	\$ 1,095.00	EA	\$ 3,285.00	
10	Filter Packer Replacement Sand	15	\$ 17.00	EA	\$ 255.00	
11	1.0 Inch Sounding Tube	1300	\$ 1.75	FT	\$ 2,275.00	
12	100 HP Pump Motors*	2	\$ 10,000.00	EA	\$ 20,000.00	
13	Per Diem (contract price)	6	\$ 300.00	DAY	\$ 1,800.00	
14	Contingency Amount (estimate)	1	\$5,000.00	T/M	\$ 5,000.00	
Subtotal					\$ 117,921.00	\$0.00
WA State Sales Tax (@ 8.7%)					\$10,259.13	
Total (increase / decrease)					\$128,180.13	\$0.00
Net (increase) (decrease)					\$128,180.13	

This change order provides for all compensation arising directly or indirectly for this work including money, time and impact compensation. This document will become a supplement to the contract and all provisions shall be applied hereto.

This amount is hereby <b>added</b> /deleted to the total contract price:	\$128,180.13
The total adjusted contract price to date is thereby:	\$191,008.73
Time in days provided for completion is hereby: <b>decreased/increased</b> by	9 days

**INDEPENDENT ANALYSIS/JUSTIFICATION:**

*\* These prices listed are maximum anticipated cost. Actual cost shall be by invoice plus 15% as allowed in original contract. Items listed as contract price indicate contractor is charging same hourly/daily rate from original bid. For further justification, please see attached Technical Memorandum from Associated Earth Sciences, Inc.*

Accepted by Contractor:	Date:
Approved by Public Works Director:	Date:
Approved by City Manager:	Date:



## Memorandum

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<b>Date:</b>	May 8, 2019	<b>Project Manager:</b>	Charles Lindsay, L.Hg
<b>To:</b>	City of Blaine	<b>Principal in Charge:</b>	Charles Lindsay, L.Hg
<b>Attn:</b>	Ravyn Whitewolf, Public Works Director	<b>Project Name:</b>	Well Rehabilitation
<b>Address:</b>	1200 Yew Avenue Blaine, WA 98230	<b>Project No:</b>	180074H006
<b>Subject:</b>	PW-1R and PW-3R Development and Pump Inspection		

The production capability of PW-1R has reduced from 4.5 gpm/ft of drawdown in 1995 to less than 0.9 gpm/ft by 2018 and the production capability of PW-3R has reduced from 2.3 gpm/ft of drawdown in 1998 to less than 1.0 gpm/ft by 2018. The result is that the sustainable pumping rates of the wells are currently less than 50% of their approved water right maximum pumping rates of 450 gpm and 500 gpm, respectively.

The reduction in production capabilities of the two wells has been caused by a slow/natural migration of fine-grained sediment into the screen assemblages installed in the wells. Redevelopment of the well screens to remove the fine-grained sediment was necessary to improve the production capabilities of the wells. Typically the redevelopment of well screens should be done roughly every decade to maintain the maximum production capabilities of a well. PW-1R and PW-3R have not been redeveloped since they were installed in 1995 and 1998, respectively.

In early 2019, the City of Blaine (City) contracted Holt Services to removed the pumps from the wells and redeveloped the well screens to remove fine-grained sediment from around the well screens and improve the production capabilities of the wells. Typically, well development activities are done until the well stops producing significant quantities of sand and other fine-grained material. Accurately predicting the number of hours necessary to thoroughly redevelop a well to the point that is producing little to no sand is almost impossible.

The PW-1R and PW-3R well development activities completed by Holt Services resulted in the removal of over 17 feet of fine-grain sediment that had been accumulating near the well screens in both wells over the past 20 years. Consequently, the well development activities required almost twice as many hours than were anticipated in the original contract with Holt Service. It should be noted that the removal of such a significant amount of sediment indicates that the well development activities were successful and that the production capabilities of the two wells should be significantly increased.

During removal and inspection of the well pumps (required to redevelop the well screens) it was discovered by Holt Services that (1) both pumps had been installed with wiring systems that were not in compliance with the pump manufacture specifications, (2) both pump motors had been grounded incorrectly, and (3) that

nearly all of the 6-inch-diameter drop pipe installed in PW-1R was damaged by rust/corrosion to point where it cannot be reused in the well. Furthermore, diagnostic testing indicated that both pump motors were damaged and needed to be replaced, likely due to the incorrect grounding of the motors.

Replacing the wiring systems, pump motors and roughly 660 feet of drop pipe is necessary to get the two wells connected to the system and operational. Because these problems were not known until the pumps had been removed from the wells, the costs associated with replacing these items were not included in the original contract with Holt Services.