



Cheryl Porter
Chief Operating Officer
Water and Field Services
735 Randolph Street, Suite 1900
Detroit, Michigan 48226
Phone: 313-964-9390

Memorandum

To: Honorable Board of Directors

From: Cheryl Porter, Chief Operating Officer – Water and Field Services

CC: Sue McCormick, Bill Wolfson

Date: January 2, 2019

RE: Overview of Water and Field Services Change Orders Recommended for Approval by GLWA Board of Directors at January 23, 2019 Meeting

Contract change orders that will be recommended for approval by Cheryl Porter, Chief Operating Officer – Water and Field Services at the January 23, 2019 GLWA Board of Directors meeting are as follows:

1. Contract No. GLWA-DWS-891, Pressure Reducing Valve (PRV) Vault Improvements, Vendor: Lakeshore Global Corporation, Change Order 1
2. Contract No. DWS-858, Wick Road Pumping Station Improvements, Vendor: Toolos Contracting Group, Change Order 4

A brief summary of the two contracts where change orders will be requested are as follows:

Change Order 1 –Contract No. GLWA-DWS-891

- Contract Type: Construction
- Amount: \$1,849,500.00
- Vendor: Lakeshore Global Corporation
- Change order needed to increase contract amount and extend time
- Proposed new contract amount: \$2,490,994.28
- Proposed new contract end date: March 30, 2019

GLWA-DWS-891 Change Order No. 1 was first submitted to the Board at the November 28, 2018 meeting. We have attached additional detail on why the change order did not get processed timely before the expiration of the contract. There was a submission of a

change order approximately 6 weeks prior to the contract end date that would have extended the contract time. But it was determined by staff without executive leadership input to not finalize that change order to wait for the monetary portion that would be associated with the change order for the line stop work. Corrective measures are in place that has clarified to staff that the result of this practice is not acceptable.

Change Order 1 – Contract No. DWS-858

- Contract Type: Construction
- Amount: \$13,699,409.00
- Vendor: Toolles Contracting Group
- Change order needed to extend contract time and a credit of \$152,307.76
- Proposed new contract amount: \$13,547,101.24
- Proposed new contract end date: February 28, 2019

A change order is needed for DWS-858 to extend the contract duration due to a prolonged conflict between the primary contractor and his sub-contractor. This prevented GLWA from getting the appropriate release in order to close out the contract.



INTRA-DEPARTMENTAL MEMO

FROM: Eric Kramp and Grant Gartrell DATE: December 20, 2018
TO: Sue McCormick, Cheryl Porter, Nicolette Bateson, William Wolfson
RE: Contract DWS-891 Change Order Work

Executive Summary

This memorandum describes the reasons why the change order work associated with replacing pressure reducing valves (PRVs) at two locations was performed prior to authorization from the GLWA Board of Directors. These two locations included PRVs at the North Service Center (NSC) and at the intersection of Marquette and Inkster Roads.

At NSC, operating water pressures at customer master meters were frequently higher than the contract maximum pressures because the existing PRV at this site had failed. At Marquette and Inkster, the opposite was true with operating water pressures at customer master meters being occasionally lower than contract minimum pressures because the existing PRV at this site had failed. Moreover, the transmission main associated with the Marquette and Inkster PRV is a backup feed to a large service population in the event that a break occurs on this area's primary feed. With the Marquette and Inkster PRV out of service, this service population was at risk.

Replacement of the PRVs relied upon adjacent isolation valves being operable. Numerous attempts were used to rely on the isolation valves for an acceptable seal but were unsuccessful. An alternative means, line stops, were used to isolate the transmission main and install the new PRVs. The line stops were considerably more expensive than using existing isolation valves, however, the line stops allowed the installation of the new PRVs. The additional cost of the line stops was considered to be a greater benefit than the negative consequences associated with operating outside customer contract pressures and other risks.

The Contracting Officer and Water Operations staff were processing a change order about 6 weeks prior to the contract end date that would extend the contract time by 1 year. This change order was not finalized, however, because it was known that the line stops were required and that a larger change order would be required. Therefore, work was allowed to proceed beyond the contract end date. Subsequently, the decision to install the line stops and negotiate the additional cost with the contractor prior to execution of a contract change order was made at the Contracting Officer level with significant input from Water Operations (refer to Attachment A).



Background

Project DWS-891 rehabilitated five existing pressure reducing valve vaults (PRV Vaults), including installation of new PRVs. Three were in the City of Detroit and two in the suburbs. The work to the three in the City of Detroit were completed prior to the proposed change order. The remaining two PRV vaults, at Marquette and Inkster, and North Service Center are the subject of proposed Change Order No. 1 for DWS-891. This proposed Change Order No. 1 primarily provides for line stops at the two aforementioned sites, and also resolves the provisional allowance and contract time.

The Marquette and Inkster PRV Vault separates Springwells Intermediate and Southwest pressure zones and provides two related functions. During normal operation, it allows Springwells to support Southwest to provide adequate pressure to communities generally on the western and southwestern portions of the transmission system. If there is a water main break between Southwest and the intersection of Inkster and Michigan Avenue, this Pressure Reducing Valve Manifold opens more fully, and becomes critical to the supply of member partners Inkster, Taylor, Romulus, Garden City, City of Wayne, Huron Township, Ypsilanti Community Water Authority (YCUA), Van Buren, etc.

There are two primary discharge lines from North Service Center. The 84-inch transmission line primarily serves the member partners Troy and the Southeastern Oakland County Water Authority. The 54-inch water main primarily feeds the member partner North Oakland County Water Authority. The supply to the PRV vault is provided from the 54-inch water main through a 24-inch cast iron water main. The North Service Center PRV vault is necessary for GLWA to be able to supply Shelby Township and Utica at contract and water main design pressures.

The original contract final completion date was August 5, 2016. By the summer of 2016, it was clear that the project sites at North Service Center and the intersection of Marquette and Inkster were not going to be completed prior to this date. Before the contract expired, on or around June 20, 2016, a draft Change Order Number 1 was circulated between Procurement, Water Engineering, and the Contractor to add approximately one year to the project. When the isolation of the two remaining sites proved impossible with the existing valves, and it became clear that line stops would be the only alternative, it was agreed by GLWA Contracting Officer and Water Operations staff to capture the additional costs associated with the line stops in a revision of Change Order No. 1.

Resolving the technical scope for the line stops took approximately three months, and the contractor spent the same amount of time developing their quotation. The contractor submitted a preliminary quotation on or around March 17, 2017. This preliminary quotation was reviewed and approved for technical adequacy by Water Engineering, and authorized by Procurement, on March 22, 2017. This authorization was subject to confirmation of effort.



The work generally proceeded in April through June 2017, when the Contractor submitted a final quotation. GLWA noted that this quotation did not have sufficient supporting documentation to be approved and requested further details as stipulated in the March 22, 2017 authorization. The negotiations on this change were led by GLWA Procurement and were substantively completed in June 2018. The negotiations led to a reduction of fees in the amount of \$168,987.07. The Contractor reissued their quotation request in conformance with these negotiations in June 2018. The draft Board Summary and Change Order form were completed in August 2018. After internal reviews and editing, this Board Summary was presented in November 2018.

Justification – Marquette and Inkster Pressure Reducing Vault

During normal operation, this PRV vault provides some flow from the Springwells Intermediate service area into the Southwest service area, bolstering pressures along Inkster and along Michigan Avenue to the west. Without this additional pressure, borderline low-pressure conditions existed at Meter Pit IK-01, the City of Inkster’s primary feed.

An analysis of the pressure delivered to vaults near this PRV vault demonstrates that GLWA had to provide additional support to this area. During the year before the rehabilitation of this meter pit, GLWA’s Wholesale Automated Meter Reading (WAMR) system recorded data for minimum and average hourly pressure values to the nearest operating downstream meter pit did not meet the limits specified in the contract as shown on Table 1, below.

Table 1: Marquette and Inkster Pressures Outside of Contract Limits

Design Criteria	Percent of minimum hourly pressures below contract minimum	Percent of average hourly pressures below contract minimum
IK-01 (prior to construction) (41 PSI)	9%	3%
IK-01 (after construction) (41 PSI)	1%	0%

Once the work at Marquette and Inkster was completed, the pressure supplied to IK-01 has remained constantly within GLWA internal standards. Please see captured WAMR graph for IK-01 for the year of 2017. The improved pressure after the PRV vault was installed is observable on Chart 1: 2017 Average Hourly Pressure at IK-01, below.

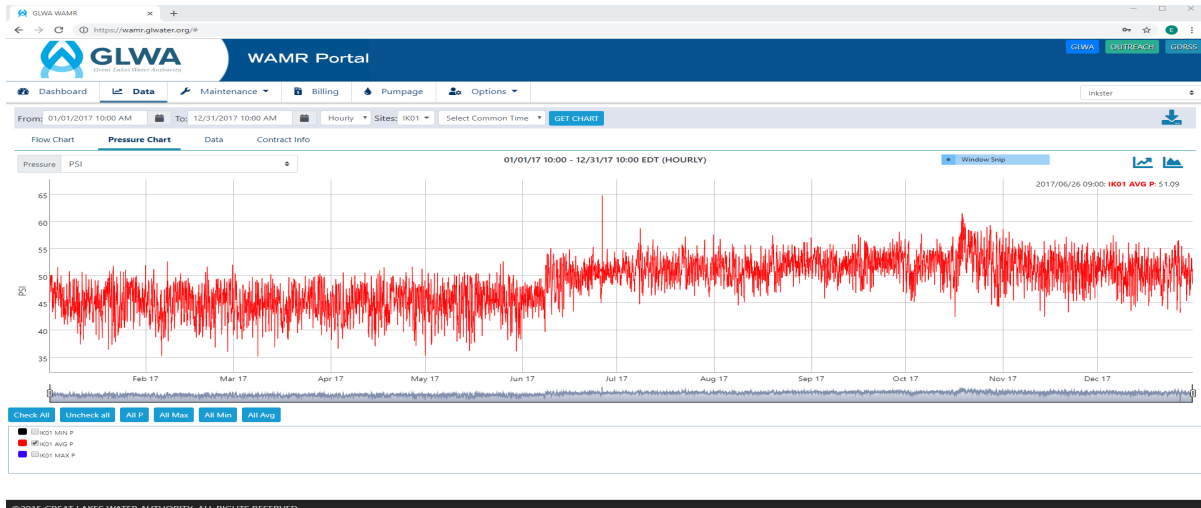


Chart 1: 2017 Average Hourly Pressure at IK-01

When Southwest service is compromised, this PRV station will open more fully and allow Springwells to provide service to member partners generally in the southern and western portion of the transmission area. While the likelihood of the Southwest Water Treatment Plant going completely out of service is relatively low, when combined with the much higher likelihood of a water main break preventing service to this area from Southwest along with the severity of this interruption, made the repair of this PRV very important to GLWA’s ability to serve Taylor, Romulus, Garden City, City of Wayne, Huron Township, YCUA, Van Buren, etc. The repair of this PRV vault was critical to GLWA being able to meet its daily contractual responsibilities and to support multiple communities in case of an emergency.

Justification —North Service Center

The Pressure Reducing Valve Vault at North Service Center consists of a manifold of two trains of PRVs in parallel. While the repairs to this PRV vault was always included in DWS-891, pressure data from downstream meter vaults indicate that in Spring 2015 additional failures in the PRV vault effectively made it non-functional. When this vault was inspected prior to construction, the valves were found to be leaking at a very high rate. Because of this high rate of leakage, this vault was not safe to enter and could not be made safe to enter without depressurizing the 54-inch water main.

This figure is based on the size of pump that was used to keep up with the leakage. On November 13, 2016, the 84-inch water main from North Service Center had a catastrophic failure. Because of valve issues downstream of North Service Center, it was discovered that the 54-inch could not be isolated separately from the 84-inch, and to execute the PRV valve



vault without a line stop would have required taking North Service Center entirely out of service. Given the observed impact during the November 2016 shutdown, another shutdown of North Service Center, even if planned, was deemed unworkable in that it would have customers without water.

While all water mains are designed with a factor of safety, the 84-inch between west of North Service Center failed at a pressure lower than its design pressure.

The failure of the NSC Pressure Reducing Valve Vault put the downstream GLWA transmission main at risk. In the year prior to the work performed at North Service Center, GLWA was operated at pressures greater than customer contract maximum pressures. Please see Table 2 – NSC PRV Pressure Compliance with Maximums

Table 2: NSC PRV Operating Pressure Maximums

Design Criteria	Percent out of average hourly pressures above contract maximum	Percent of maximum hourly pressures higher than upper specification limit ⁽¹⁾
Water Main Design at SY-01 (150 PSI)	1%	6%
Contract Maximum Pressure at SY-01 (126 PSI)	45%	60%
Water Main Design Pressure at SY-06 (150 PSI)	0%	2%
Contract Maximum Pressure at SY-06 (121 PSI)	48%	64%
Water Main Design at UT-01 (150 PSI)	10%	19%
Contract Maximum Pressure at UT-01 (135 PSI)	39%	54%
(1) The specification limit refers to both the contract maximum pressure and the design maximum working pressure of the transmission main. Actual values or specification limits are shown parenthetically in the design criteria column.		

Since completing the project, the pressures downstream of this PRV vault have been within customer contract design pressures 100% of the time. The more controlled, lower pressure after the PRV vault was installed is observable on Chart 2: 2017 Average Hourly Pressure at UT-01, below.



Chart 2: 2017 Average Hourly Pressure at UT-01

As previously documented, the 24-inch water main protected by this PRV vault was often operating at or above its design pressure, and above GLWA contractually specified maximums. While the repair of a 24-inch water main is not as onerous as the repair of an 84-inch water main, because of the lack of isolation, North Service Center would have to be taken out of service entirely to repair it. The likelihood and severity of a water main break along this 24-inch water main thus were both relatively high.

The repair of this PRV vault was critical to GLWA being able to meet its daily contractual responsibilities, decrease the likelihood of failure downstream of it, and to support multiple communities in case of an emergency.

A table of relevant events associated with this proposed change order from Procurement is below:

DWS-891 Change Order 1 Timeline	
11/28/2018	GLWA Board Meeting
11/14/2018	O & R Committee
10/8/2018	Project Manager communicated that Water Operations Engineering Director supported November Board date
10/3/2018	Procurement followed up on 8-20-18 request
9/12/2018	Received Board letter draft from Project Manager
9/11/2018	Procurement requested Board letter
8/20/2018	Received confirmation from Owner's Representative Engineer that change order figure is accurate.
8/20/2018	Procurement requested confirmation from Owner's Representative and Project Manager that change order figure reflected negotiated amount.
8/18/2018	Received change order signed by vendor



DWS-891 Change Order 1 Timeline	
8/17/2018	Change order created to reflect negotiated amount.
8/16/2018	Collaborative effort between Project Manager and Owner's Representative Engineer change order development.
6/15/2018	Vendor letter requesting change order in the amount of \$641,494.28
5/14/2018	GLWA letter accepting reduction
4/4/2018	Negotiations resulted in <u>reduction of \$168,987.07</u>
3/7/2018	Negotiations began
3/7/2018	Owner's Representative (GLWA) requested information from vendor to substantiate fees.
3/7/2018	Owner's Representative requested LGC to provide closeout documents per the contract
2/7/2018	LGC provided revised cost proposal
12/12/2017	Project Manager sent LGC a second request for backup documents
9/20/2017	Project Manager sent a request for additional information to LGC for cost backup
9/19/2017	LGC Change Order Submitted to Owner's Representative Engineer and on 9/20/17 Owner's Representative Engineer requested additional information
6/1/2017	LGC Submitted Change Order to Project Manager
5/8/2017	Linestop installed at NSC
3/22/2017	CPO authorized LGC to proceed for fee of \$810,481.35*
3/31/2017	Owner's Representative Engineer Manager sent authorization to General Counsel for review and recommendations
3/29/2017	Project Manager drafted authorization to proceed
3/17/2017	LGC provided cost proposal
1/13/2017	Marquette and Inkster-The need to provide isolation valve identified.
1/17/2017	Project Manager sent a second request to LGC for final costs for CO#1
6/20/2018	Project Manager sent DWS-891 CO #1 to LGC
6/1/2016	CO #1 Submitted requesting 328 Days only added
2/27/2016	Project Manager issued revised drawings to Lakeshore for pricing due to differing field conditions.
*The authorization was qualified with "GLWA evaluating quotations and reserves the right to negotiate the total amount for these changes in the near future."	

Attachment

- a. DWS-891 PRV Line Stop Work Authorization to Proceed from Contracting Officer

Attachment A



PROCUREMENT
ROOM 1501
735 RANDOLPH
DETROIT, MICHIGAN 48214

March 22, 2017

LCG Global
7310 Woodward Avenue
Detroit, MI 48202

Attention: Anant Narare
Project Manager

Gentlemen:

**Regarding: GLWA Contract Number DWS-891
Pressure Regulating Valve Vault Improvements
Authorization to Proceed
Line Stops for Marquette and Inkster, and North Service Center**

This gives reference to your emailed quotations from March 18, 2017 for the aforementioned contract. In these letters, you quoted \$464,095.91 for the provision of two 24-inch line stops around the Pressure Regulating Valve (PRV) Vault at Marquette and Inkster Roads, and \$346,385.44 for the provision of one 24-inch line stop upstream of the PRV Vault at North Service Center.

The existing ball valves in the vicinity of the isolation at Marquette and Inkster Roads have been found to be non-effective at providing isolation. Without the use of line stops, the Great Lakes Water Authority would be forced to take the Springwells Water Treatment Plant out of service to perform this work. As this is not practical, and the work at the PRV is necessary for proper separation of pressure zones within the transmission system, it is therefore necessary to perform the isolation with line stops.

Late last year the 84-inch water main downstream of the North Service Center (NSC) had to be taken out of service due to a rupture. During this action, the considerable GLWA resources had to be spent to switch flows between the parallel 54 and 84 inch water mains, and both mains experienced changes to flow and

pressure during the change. The PRV Vault must be isolated with minimal impact to the water mains through a line stop to avoid these oscillations in flow and pressure.

Lakeshore Global is authorized to proceed with the work for Not To Exceed amounts of \$464,095.91 and \$346,385.44, respectively, for the line stop work at Marquette and Inkster, and North Service Center. That said, GLWA is evaluating your quotations and reserves the right to negotiate the total amount for these changes in the near future.

The Great Lakes Water Authority also notes that, as provided, the quotations are insufficiently clear to support the scrutiny of an audit. There may be additional items to note, but the following has been observed as requiring additional clarity:

1. Confirmation that rental rates for equipment is the appropriate unit of time. This work should not be based on the daily rate, as appears to be the case.
2. Confirmation of the costs, including daily rental calculations, associated with the subcontractor's work. For example, the quotation for the isolation valve is listed as \$87,250.00 for North Service Center but is shown in your worksheet as \$109,800.80. All calculations should be shown
3. Supporting documentation on subcontracting costs not yet provided – County Permitting Fees, Concrete Testing, Traffic Control Costs, etc.

If you have questions, please call.

Very truly yours,



G. Johnson
Chief Procurement Officer

GJ/TD/GG/ECK
attachment

Cc: H. B. Sighn, Metco, Via Email

C.Porter, T. Daniel, G. Gartrell, T. Kuhns, E. Kramp
2017 03 22 DWS-LSG-DWS891-003 -- LOI Marquette and Inkster and NSC



INTRA-DEPARTMENTAL MEMO

FROM: Eric Kramp and Grant Gartrell DATE: January 2, 2019
TO: Sue McCormick, Cheryl Porter, Nicolette Bateson, William Wolfson
RE: Contract DWS-858

Executive Summary

This memorandum documents the change order history of Contract No. DWS-858. Contract DWS-858 is a “legacy” contract for GLWA, originally started in 2008 under DWSD. The prime contractor, Tooles Contracting Group, reached substantial completion in 2014 before the contract ended. Additional work was added to the contract through Change Order 1 and Construction Change Directives only. Change Orders 2 and 3 added 385 and 912 days, respectively to the contract duration for administrative contract close-out activities after completion of work at the site. The contract end date, established through Change Order 3, was June 20, 2016. This final change order (change order 4) adds time that is required to finally close out the contract now that all final documentation has been submitted in an acceptable form to GLWA. No work has been performed at the site since the contract time ended on June 20, 2016.

The primary outstanding issue that prevented the contract from being closed since June 20, 2016 was between the prime contractor and one of their major equipment suppliers. The contract stipulates that the contractor must secure final waivers from all subcontractors and suppliers prior to release of final payment. The prime contractor and the major equipment supplier needed time to come to mutually acceptable terms for back charges and additional work between the two entities. GLWA suggested that an alternative relief mechanism where the prime contractor, the vendor, and the surety agreed that to release GLWA from all responsibility might provide satisfactory protections for the contract to be closed. This alternative was not pursued by the prime contractor.

The release from the major equipment supplier was provided to GLWA on October 17, 2018. This change order for Contract DWS-858 has been prepared to close out this contract now that the last final waiver has been received.