

April 23, 2018

Beechwood Well Containment Cost Review

Background

September 2015 - Uncontrolled Water Flow

In the course of installing a geothermal well at 7084 Beechwood Street the owner employed an unqualified well driller and encountered uncontrolled aquifer¹ flow. The City treated this incident as an emergency and activated the Emergency Operation Centre (EOC) to monitor the water flow. The City was concerned that the water breach could damage other properties and become a risk to neighborhood safety. To obtain better situation awareness the City also liaised with the consultants and contractors hired by the property owner to stop the water flow. As this incident falls under the Forest, Lands and Natural Resource Operations (FLNRO) Ministry in B.C., the city maintained close contact with the FLNRO staff.

March 2016 - Shared Cost and Mutual Cooperation Agreements

When the owner did not pay the work performed by the consultant and contractor, the latter threatened to stop working. The City acted immediately to prevent further risk of damage to infrastructure and neighboring properties by entering into a shared cost agreement with the provincial government.

Under the shared cost agreement with the Province of B.C., the province agreed to provide the City with a maximum amount of \$1 Million as its contribution toward 50% of estimate reasonable cost the City incurs in carrying out this project.

The City also signed Mutual Cooperation Agreements (MCAs) with BC Groundwater Consulting Services Ltd. (consultant) and Fyfe Well and Water Services (contractor), original consultant and contractor, to continue working on that site. The key messages in sections 2.5 and 2.6 of the MCA were:

2.5 Vancouver now agrees that, despite any term to the contrary in each new Contract, Vancouver will make payment to each Contractor in accordance with the Original MCA as though the Design Contract and Work Contract had not been terminated by the Contractor and as though such Contracts remained in effect and the Owner was simply continuing to be in default of payment under same and accept the Contractor's performance of same.

2.6 For certainty, Vancouver and each Contractor agree that all references in each New Contract to it being "the entire agreement" and replacing all prior agreements and similar clauses will not have such effect on this MCA and this MCA continues to

¹ An **aquifer** is a geological formation or underground layer of rock, gravel, sand or silt that contains groundwater that can be brought to the surface through water well.

supersede and govern to the extent of any and all inconsistencies between the New Contract and this MCA.

Containment Management

Management of the containment work relied mainly on the consultant's supervision over the contractor, as the specialized hydrological expertise is not available at the City.

The City assigned staff from Legal Services, BPPS, Engineering and Finance to monitor the work completed and review submitted expenses from the consultant and contractor. The responsibilities of the departments involved were as follows:

Legal Services:

- provided legal advice.

Business Planning and Project Support (BPPS):

- coordinated City departments' work with the contractors to keep the containment work going;
- proposed any contingency plans if the owners stopped paying for the remediation; and
- reviewed, coordinated and forwarded the invoices to Engineering for final check, authorization and payment.

Engineering Liaison:

- ensured that work performed by the consultant and contractor were essential to contain the well flow and to close the borehole;
- attended the worksite regularly to monitor work progress;
- conferred with the consultant and contractor on work issues;
- reconciled their invoices to daily work and equipment usage records for any discrepancies; and
- approved their invoices for payment.

Budget Office from City Finance, Risk and Supply Chain Management:

- tracked all the expenses; and
- provided updates on the expenditures incurred periodically.

Containment Costs

Containment costs rose from an initial estimate of \$ 2.5 Million in early 2016 to \$ 11.8 Million by February 2018. To ensure work performed was necessary from an engineering perspective, an external peer review was completed to provide quality assurance. Engineering also conducted regular site inspections and approved the work performed.

A revised cost estimate was developed by BPPS working with the consultant and contractor in late 2016 when the feasibility of a permanent closure could be accurately determined. The project is entering its final phase as the water flow has stopped. The closure will be monitored for a minimum required period ensuring it does not breach its seal. A further estimated \$940,000 will be incurred by the end of 2019 for leakage monitoring and

decommissioning costs. Total cost to the City is projected to be \$ 12.7 Million less a financial contribution of \$ 1M from the Province of B.C.

Scope

Section 5.8 of the Professional Services Agreement between the City and BC Groundwater Consulting Services Ltd., and section 6.5 in the Construction Services Agreement between the City and Fyfe Holdings Ltd. (contractor), provide the City the right to verify the accuracy and validity of all billings and payments made and to take extracts from the records of the consultant and contractor.

The audit reviewed the consulting and contracting services rendered and determined whether:

- Expenditures relating to consultant and contractor's agreements were accurately reported;
- Payments were made in accordance with the terms of the contract; and
- Consulting contracts were effectively managed to ensure the contract deliverables were achieved.

The audit is not designed to detect fraud. Accordingly, there should be no such reliance.

Conclusion

In March 2016, the City contracted BC Groundwater Consulting Services Ltd. (Consultant) and Fyfe Well and Water Services (Contractor) to contain the uncontrolled aquifer flow at 7084 Beechwood Street. This audit was conducted to ensure all related expenses, rates and charges paid by the City were correctly calculated and applied in accordance with the contract terms. The audit also assessed whether the containment work was managed effectively.

The contractor's invoices were mostly compliant with the contract terms. However, the contractor incorrectly charged the City \$ 316,810 for additional daily labour and living allowances and a number of administration staff's hours. To effectively manage this type of project, staff responsible for invoice review and approval should ensure that they are fully conversant with contract terms

The more significant findings and recommendations are:

E.1 Recovery of overcharged amounts for contracting work

Fyfe did not follow the agreed MCA contact terms and charged the City daily labour and living out allowances that were already included in the composite daily charge in the contact with the owner. This would result in recovery payment of \$313,350.

E.2 Recovery of amounts for consulting work performed using incorrect hours

The City should recover overcharges for an incorrect rate used by the consultant. This would result in a repayment of \$3,460 to the City.

E.3 Improve invoice review process

The project governance model is considered satisfactory for any future similar emergencies. For future projects, all City staff responsible for invoice review and approval should ensure they are fully conversant with signed agreements and that all contract terms are understood.

Findings and recommendations have been discussed with management and work is underway to address them.