

## Report to Civic Works Committee

**To:** Chair and Members  
Civic Works Committee

**From:** Kelly Scherr, P.Eng., MBA, FEC  
Deputy City Manager, Environment & Infrastructure

**Subject:** Planned Rebuild of Incinerator Systems at Greenway  
Wastewater Treatment Plant – Single Source

**Date:** March 21, 2023

## Recommendation

That, on the recommendation of the Deputy City Manager, Environment & Infrastructure, the following actions **BE TAKEN** with respect to the upcoming renewal of the incinerator at the Greenway Wastewater Treatment Plant:

- a) the Civic Administration **BE AUTHORIZED** to single source certain goods and services required, as described in this report;
- b) the financing for this project **BE APPROVED** as set out in the Sources of Financing Report attached hereto as Appendix 'A'; and
- c) the Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, if required, to give effect to these recommendations.
- d) the Civic Administration **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this project.

## Executive Summary

### Purpose

This report informs Council of an upcoming, planned renewal of the sludge incineration process at Greenway Wastewater Treatment Plant. It also seeks Council approval in advance for single source procurement of certain goods and services.

### Context

Incineration is the final process in the disposal of waste solids generated at London's five wastewater treatment plants. Administration is developing plans for its replacement within fifteen years, but the functionality of the existing incinerator must be maintained until the new system is ready for operation. Continued functionality requires a complete rebuild, which is expected to bridge the gap until the new strategy is in place. The unique nature of the project requires the hiring of specialized suppliers and service providers that warrant single source procurement in some instances.

## Linkage to the Corporate Strategic Plan

This project supports the 2019-2023 Strategic Plan through:

- Building a Sustainable City: build infrastructure to support future development and protect the environment; and manage the infrastructure gap for all assets.

# Analysis

## 1.0 Background Information

### 1.1 Previous Reports Related to this Matter

Civic Works Committee, October 4, 2022 – Emergency Repair of Incinerator Systems at Greenway Wastewater Treatment Plant.

Civic Works Committee, June 18, 2019 – Single Source Procurement – Greenway Reheater

Civic Works Committee, May 26, 2014 – Single Source Purchase of Pre-Heater Heat Exchanger and Re-Heater Heat Exchanger at Greenway Wastewater Treatment Centre

## 2.0 Discussion and Considerations

### 2.1 Sludge Incineration at Greenway WWTP

The Greenway Wastewater Treatment Plant is the City's largest treatment plant. It is also the location of a centralized solids handling facility that processes the waste sludge removed from wastewater at all five City wastewater treatment plants in preparation for disposal. This final stage of the treatment process is essential for the safe and effective operation of the treatment facilities to ensure the protection of public health and the environment.

Incineration takes the solids removed from wastewater through the treatment process and burns them at temperatures approaching 900 degrees Celsius. This reduces the solids to an inert ash that is ready for safe disposal. In this manner, the City safely treated over 4,800 dry tons of waste solids in 2021.

There is no standby or spare incinerator at Greenway. If the incinerator is out of service it requires Greenway Operations to utilize a lime stabilization process that neutralizes contaminants in the dewatered sludge and allows for transportation and disposal. This process is costly; supply of lime, trucking costs and disposal fees can total \$60,000 per week or more. It is also not always possible to continuously haul stabilized solids, as compared with incineration that can run regularly, meaning that hauling may not always be able to keep up with process demands. This leads to increased and extended sludge storage and can result in plant upsets.

### 2.3 Accelerated Incinerator Renewal Timing

Given the essential nature of the incinerator, a full asset renewal was planned. The majority of the budget required for a full renewal of the incineration system was allocated in 2024, and this renewal would allow the incinerator to remain in service for an estimated 10-15 years beyond that. Since this renewal is expected to be the last one possible for the existing infrastructure, the next strategy for solids management will need to be finalized and ready to commence the transition by 2034. Planning efforts are ongoing to develop integrated strategies for solids handling and disposal that align with other initiatives in the City.

Unfortunately, recent experience with duct work failures and observations regarding the condition of the current incinerator shell have forced staff to revise the previously developed timing. Preparations are now underway to initiate the procurement of goods and services to allow for work to commence as soon as possible rather than waiting until 2024. As a result, the primary purpose of this report is to seek approval to advance a portion of the budget currently allocated to 2024 to the current year for immediate use for some key procurements.

## 2.4 Procurement Process

The re-build of an incinerator and associated systems is a complex, time-consuming and costly undertaking. A wide array of specialized service providers and suppliers are required in order to successfully deliver a system that will provide reliable service for over a decade. Because London's incinerator system is somewhat unique – there are only four other plants in the province that employ incineration, and each employs different strategies of operation – there is a significant advantage in some cases to directly contracting firms with prior experience with the City's system.

In order to better inform Council, all of the expected procurements required for the incinerator renewal project are listed in the following table. It is important to note, however, that the request for approval relates only to the first section of the table (Section A). The remainder is expected to be procured within standard procurement practices and utilizing available capital budgets. The type of procurement is also listed, with a justification for any non-competitive processes to follow.

| Item/Work Task  | Budgetary Estimate                            | Procurement Process   | Vendor                    |
|---|---|---|---------------------------|
| <b>Section A - Essential Tasks/Purchases that must be completed in 2023</b> |   |   |                           |
| Engineering Services – Detailed Design and Contract Administration          | \$812,646 + contingency = \$860,000           | SS-2023-050<br>Single Source – uniquely qualified firm  | Jacobs Engineering        |
| Pre-Heater (Primary Heat Exchanger) with plenums                            | US\$1,921,000 + contingency = \$3,330,000 CDN | SS-2023-051<br>Single Source – Previous supplier with high quality products. Long lead times. | Arvos/Schmidtsche-Schack  |
| Re-Heater (Secondary Heat Exchanger)  | US\$371,000 + contingency = \$630,000 CDN     | SS-2023-051<br>Single Source – Previous supplier with high quality products. Long lead times. | Arvos/Schmidtsche-Schack  |
| Main Burner Replacement   | \$163,384 + contingency = \$200,000           | SS-2023-052<br>Single Source – Specific design for main burner. Long lead times               | Lakeside Process Controls |
| <b>Sub-total Section A</b>  | <b>\$5,020,000</b>                            |   |                           |
| <b>Section B - Important Future Purchases (For Information Only)</b>        |   |   |                           |
| Expansion Joints  | \$500,000                                     | Tender with Pre-Qualification   |                           |
| Refractory Brick Pre-Purchase   | \$400,000                                     | Tender  |                           |
| Incinerator Re-build General Contract                                       | \$5,000,000                                   | Tender with Pre-Qualification for General and Sub-Contractors                                 |                           |

|                               |                     |   |  |
|-------------------------------|---------------------|---|--|
| Fluidizing Blower Purchase    | \$600,000           | Tender with Pre-Qualification               |  |
| Stack Upgrades                | \$1,200,000         | Tender with Pre-Qualification               |  |
| Venturi Scrubber              | \$500,000           | Tender with Pre-Qualification               |  |
| <b>Sub-total (Section B)</b>  | <b>\$8,200,000</b>  |   |  |
| <b>Total (Section A + B)</b>  | <b>\$13,220,000</b> |   |  |
| <b>Total Budget Available</b> | <b>\$11,000,000</b> | <b>Includes 2023, 2024 and 2025 budgets</b> |  |

Table 1: Expected Procurements

Section A in Table 1 above identifies four essential procurements required for the renewal of the incinerator. These items are brought forward now as a result of timing or long lead times that, if not initiated now, could impact the ability to complete the incinerator renewal in 2024. All four are single source procurements for which approval is requested, are exclusive of taxes but include some contingency as noted below.

First, Jacobs Engineering has recently provided multiple reviews of the City’s incinerator and related systems, while key staff from the proposed team participated in the last incinerator rebuild in 2008 under the employ of a different consulting firm. This direct experience with London’s incinerator, coupled with significant experience with other incinerator systems in Ontario, results in the Jacobs team being uniquely qualified for this assignment. This design work must be undertaken now to enable construction to occur in 2024. Therefore, Civic Administration requests approval to award this project to Jacobs Engineering as described in clause 14.4.e (“The required...services are to be supplied by a particular supplier having special knowledge, skills, expertise or experience.”) and per 14.5.a.ii of the Procurement of Goods and Services Policy (“Awards which qualify to be considered as a Single Source...require [that] Committee and City Council must approve as award greater than \$50,000.”). For conservative budgetary purposes, a contingency of just over \$47,000 is added to allow for unforeseen adjustments during design and construction.

The second and third single source requests relate to the purchase of large heat exchangers. The pre-heater is a large heat exchanger that uses the very hot flue gas leaving the incinerator to pre-heat the fresh air being provided to the incinerator. This process is an important step in the functionality and efficiency of incinerator operation. The re-heater is a smaller heat exchanger that functions in much the same way, although its primary function is to impart additional heat to the flue gas prior to it entering the stack. This reduces condensation in the flue gas, which extends the life of the stack itself. These pieces of equipment are part of the duct system but are long-term consumable items. Arvos/Schmidtsche-Schack (Arvos) provided the currently installed heat exchangers following previous experience with other vendors that were less than satisfactory. Staff is satisfied with the quality of products provided by this vendor. Lead times for this equipment are very long (38-42 weeks), and staff are recommending that Arvos be awarded the supply contract as a single source because of their strong past performance, the ability to supply an exact replacement for existing equipment and to reduce the duration of the construction contract. The applicable sections of the Procurement of Goods and Services Policy are 14.4.d (“There is a need for compatibility with goods or services previously acquired.”), 14.4.e and 14.5.a.ii. These quotes were provided in US dollars and so have been adjusted to include a contingency for fluctuating exchange rates and volatility in the market for raw materials. It is hoped it will not be required.

The final single source request is for a replacement main burner. During the last upgrade it was discovered that the main burner in the incinerator, responsible for firing

during start-up to bring the bed up to temperature, was damaged and required replacement. The replacement was specially designed and installed under the Organic Rankine Cycle engine project as part of a larger gas train replacement at that time. Minor improvements have since been made to the design, such that this customized unit is now unique to the application at Greenway. Pricing has already been obtained from the vendor, with the estimate identified including an allowance for shipping. Quoted lead times are very long (28-36 weeks), so pre-purchase is recommended given the critical nature of this component. Given the challenging environment in which this equipment is installed, staff intend to purchase a replacement plus a spare unit. As with the heat exchanger purchase, the applicable sections of the Procurement of Goods and Services Policy are 14.4 d, 14.4.e and 14.5.a.ii. This purchase has also had a contingency added to account for volatility in the supply chain. It is hoped it will not be required.

Note that shipping of the pre-heater and re-heater will be an extra cost, currently projected at US\$42,000. This amount is only an estimate at this time, and has been adjusted to include a contingency for fluctuating exchange rates. However, because of specialized shipping requirements and ensuring responsibility rests with Arvos until the heat exchangers are received, this will also be awarded as a single source. Staff will work with Arvos to mitigate the cost of this item prior to shipping.

The costs listed in Section B are budgetary estimates only, intended to provide a scale of the undertaking but not a final overall budget for the project. While the total projection currently exceeds the expected available budget, this will be refined during detailed design and the work scope adjusted accordingly. If a requirement for additional funds is confirmed, then a future report will be presented to Council, if necessary. Further details can be found in Section 3 of this report.

Other than the four single source procurements, all other contracts and purchases required to renew the incinerator system and manage sludge disposal are planned to be conducted either by tender in accordance with the Procurement Policy or under the terms of existing contracts.

It is noted that deferral of any aspect of this project carries operational risk. All items identified in both Sections A and B of Table 1 are aging equipment that have exceeded their original expected service lives. They will all need to be replaced eventually. Maintenance programs are in place that have been successful in extending service lives as much as possible, but each additional year increases the risk of a failure that cannot be repaired. This would result in a long shut-down while replacement equipment is procured and installed, the cost of which could easily match or exceed the replacement cost estimate. If a change in conditions results in a reduction of the projected remaining service life, a separate report would be prepared in order to obtain funding required for replacement.

## **2.5 Ongoing Emergency Replacement**

Notwithstanding the preceding discussion regarding the planned refurbishment of the incinerator system, the deterioration of expansion joints in the current incinerator duct system has necessitated replacement in the short term. The purchase of the replacement expansion joints has been initiated under the emergency procurement provisions of the Procurement of Goods and Services policy. The full impact of the measures taken to repair the duct will be reported to Council once known.

## **3.0 Financial Impact/Considerations**

Wastewater Treatment Operations has planned for the renewal of the incinerator. The expected timing was 2024 to commence design and award construction. Due to the observed condition of the existing systems and lead times for key pieces of equipment, some aspects of the renewal work needs to be commenced as soon as possible.

Of note is the fact that preliminary projections for the overall cost of the incinerator renewal exceed the total available budget in years 2023-2025. This can be explained, in

part, due to rapidly increasing costs in recent years but also due to an expanding scope of work over what was previously contemplated. Accordingly, Table 1 is broken into two sections. The first, Section A, identifies work that must be completed in the short term, while Section B identifies future purchases that could possibly be amended or deferred based on the result of detailed design and any budgetary constraints. If, upon completion of the contemplated pre-purchases and the detailed design assignment, it is established that budget is available then as many of the remaining tasks will be undertaken as possible. Sources of funding have been identified for the single-source procurements identified in this report, and funding for the overall renewal will be re-evaluated as part of the 2024-2027 Multi-Year Budget development process, including a full review of potential funding sources to mitigate any budgetary shortfall, if any.

Accordingly, the source of financing at this time relates only to those items listed in Section A of Table 1. It is expected that this should be sufficient to initiate procurement of the most critical aspects of the incinerator renewal, keeping the overall project on track.

## **Conclusion**

Sludge incineration is an essential part of the City's wastewater solids disposal strategy. Unplanned shut-downs are costly and increase the level of operational risk to wastewater treatment processes. The City has plans to embark on a new solids management strategy within 10-15 years, but a renewal of the incinerator and all associated systems is required in order to maintain operations until that time. The specialized nature of some aspects of the work warrants a portion of the procurement to be conducted in non-competitive ways as described in this report, but the majority of the contracts and purchases required will be awarded competitively. Work will be completed within existing and planned capital budgets, with any additional funds being requested of Council in a future report as required.

**Prepared by:** Kirby Oudekerk, MPA, P.Eng.  
Division Manager, Wastewater Treatment Operations

**Submitted by:** Ashley Rammeloo, MMSc., P. Eng.  
Director, Water, Wastewater and Stormwater

**Recommended by:** Kelly Scherr, P. Eng., MBA, FEC  
Deputy City Manager, Environment & Infrastructure

Appendix 'A' Source of Financing

cc: Steve Mollon, Senior Manager, Procurement and Supply  
Jason Davies, Manager III, Financial Planning and Policy  
Zeina Nsair, Financial Business Administrator, Finance and Corporate Services

**Appendix "A"**

#23056  
 March 21, 2023  
 (Award Contract)

Chair and Members  
 Civic Works Committee

RE: Planned Rebuild of Incinerator Systems at Greenway Wastewater Treatment Plant - Single Source  
 (Subledger FS23GW01)  
 Capital Project ES3080 - Greenway Incinerator Refurbishment  
 Jacobs Engineering - \$860,000.00 (Engineering Services)  
 Arvos/Schmidtsche-Schack - \$3,330,000.00 (Pre-Heater)  
 Arvos/Schmidtsche-Schack - \$630,000.00 (Re-Heater)  
 Lakeside Process Controls - \$200,000.00 (Main Burner)

**Finance Supports Report on the Sources of Financing:**

Finance Supports confirms that the cost of this project cannot be accommodated within the financing available for it in the Capital Budget, but can be accommodated by advancing financing from the forecasted 2024 capital plan, and that, subject to the approval of the recommendation of the Deputy City Manager, Environment and Infrastructure, the detailed source of financing is:

| <b>Estimated Expenditures</b> | <b>Approved Budget</b> | <b>Additional Requirement (Note 1)</b> | <b>Revised Budget</b> | <b>Committed To Date</b> | <b>This Submission</b> |
|-------------------------------|------------------------|--|-----------------------|--------------------------|------------------------|
| Engineering                   | 2,190,035              | 0                                      | 2,190,035             | 1,314,899                | 875,136                |
| Construction                  | 6,131,123              | 0                                      | 6,131,123             | 6,131,123                | 0                      |
| City Related Expenses         | 607,501                | 0                                      | 607,501               | 607,501                  | 0                      |
| Vehicles and Equipment        | 1,691,893              | 3,440,914                              | 5,132,807             | 899,591                  | 4,233,216              |
| <b>Total Expenditures</b>     | <b>\$10,620,552</b>    | <b>\$3,440,914</b>                     | <b>\$14,061,466</b>   | <b>\$8,953,114</b>       | <b>\$5,108,352</b>     |

**Sources of Financing**

|   |                     |                    |                     |                    |                    |
|---|---------------------|--------------------|---------------------|--------------------|--------------------|
| Capital Sewer Rates                             | 3,445,422           | 0                  | 3,445,422           | 3,445,422          | 0                  |
| Debenture By-law No. W.-5590-307                | 1,812,530           | 0                  | 1,812,530           | 145,092            | 1,667,438          |
| Drawdown from Sewage Works Renewal Reserve Fund | 5,362,600           | 3,440,914          | 8,803,514           | 5,362,600          | 3,440,914          |
| <b>Total Financing</b>                          | <b>\$10,620,552</b> | <b>\$3,440,914</b> | <b>\$14,061,466</b> | <b>\$8,953,114</b> | <b>\$5,108,352</b> |

**Financial Note: Engineering**

| <b>Engineering</b>                   |                  |
|--------------------------------------|------------------|
| Contract Price                       | \$860,000        |
| Add: HST @13%                        | 111,800          |
| Total Contract Price Including Taxes | 971,800          |
| Less: HST Rebate                     | -96,664          |
| <b>Net Contract Price</b>            | <b>\$875,136</b> |

**Financial Note: Vehicles and Equipment**

|                                      | <b>Pre-Heater</b>  | <b>Re-Heater</b> | <b>Main Burner</b> | <b>Total</b>       |
|--------------------------------------|--------------------|------------------|--------------------|--------------------|
| Contract Price                       | \$3,330,000        | \$630,000        | \$200,000          | \$4,160,000        |
| Add: HST @13%                        | 432,900            | 81,900           | 26,000             | 540,800            |
| Total Contract Price Including Taxes | 3,762,900          | 711,900          | 226,000            | 4,700,800          |
| Less: HST Rebate                     | -374,292           | -70,812          | -22,480            | -467,584           |
| <b>Net Contract Price</b>            | <b>\$3,388,608</b> | <b>\$641,088</b> | <b>\$203,520</b>   | <b>\$4,233,216</b> |

**Total Engineering and Vehicles and Equipment \$5,108,352**

**Note 1:** The additional requirement can be accommodated by advancing a portion of the 2024 forecasted budget. Upon Council approval of the recommendation, the 2024 forecasted budget for project ES3080 will be revised.

Kyle Murray  
 Director, Financial Planning and Business Support  
 jg/lp