Hydroxyl Systems

ADVANCED WATER TREATMENT SOLUTIONS

DRAFT

August 2, 2000

*DELIVERED VIA FAX*_____

Corporation of the District of Central Saanich

_____

_____

_____

Dear _____:

Subject — Proposal for Green Municipal Enabling Fund for a Study to Investigate Wastewater Re-use for Agricultural Irrigation on the Saanich Peninsula

Hydroxyl Systems Inc. is pleased to partner with Central Saanich on a study to investigate wastewater re-use for agricultural irrigation.

The study will look at two specific scenarios that provide models for green infrastructure for a rural municipality on the urban fringe: 1) treating the Unified Treatment Plant effluent to provide recycled water for large-scale irrigation, and 2) building a small communal plant for both fresh water for drinking and recycled water for small-scale irrigation (Senanus Drive).

We are expecting that the municipality will apply for 50% funding for the study through the Green Municipal Enabling Fund (GMEF) of the Federation of Canadian Municipalities. The remaining 50% funding would be provided through in-kind contributions from *Hydroxyl Systems Inc.* and contributions from other partners. Our understanding is to minimize the financial commitment by Central Saanich.

The next step in the funding process is to submit an "Intent to Apply" to GMEF by August 20, 2000. If the Intent to Apply is accepted, a formal application must be submitted by September 30, 2000.

It would be our intent to proceed with the study only if GMEF funding is approved.

Should the District of Central Saanich decide to proceed, we would appreciate being able to review the Intent to Apply before August 20, 2000.

The cost of the study is estimated at $140,000, of which $70,000 would be requested from GMEF.

Unfortunately, due to vacation schedules, we are unable to attend the August 14, 2000 Council Meeting to present our proposal in person.

We look forward to hearing from you as you proceed to the next step.

Yours truly,
Hydroxyl Systems Inc.

David Featherstonhaugh, P.Eng.
Vice President, Wastewater & Marine Systems

Enclosures

9800 McDonald Park Road, Box 2278, Sidney, BC, Canada V8L 3S8 Tel 250-655-3348 Fax 250-655-3349
PO Box 370667, Las Vegas, NV, USA 89137-0667 Tel 702-255-7154 Fax 702-255-7280
Email • hydroxyl@hydroxyl.com Website • hydroxyl.com

Green Municipal Enabling Fund (GMEF)
Intent to Apply

Summary

The proposed project is oriented to providing green infrastructure for a rural municipality on the urban fringe of the Saanich Peninsula adjacent to Victoria, B.C. The infrastructure is of two types which, combined, would effectively contain urban sprawl. On the one hand, one aspect of the proposal would both strengthen the municipality's agricultural base; on the other, the proposed infrastructure would meet residential needs with innovative infrastructure that would not foster sprawl. Both projects would offer significant benefits for the reduction of greenhouse gases, and would dramatically increase the efficiency of water use..

The District of Central Saanich, located on the Saanich Peninsula of Vancouver Island, is a diverse mixture of agriculture, rural development (unserviced), rural development (water services only), and urban (serviced) development.

70% LAND BASE IN ALR

Two infrastructure are to be considered.

The first is the use of a large communal wastewater facility as the source of re-use water, with distribution of re-use water over a large geographic area to service agricultural needs. The two key components, a source of wastewater treatment plant effluent and agricultural activity, are both available on the Peninsula.

The second is a small, self-contained, water system based on local groundwater.. The proposed, small-scale communal system would provide clean drinking water for a small localized area and, with the purification of the wastewater produced, also provide recycled water for gardening and irrigation needs. This also model provides the opportunity to reduce potable water demands (through the expansion of the traditional centralized supply system) by diverting irrigation water from potable systems. A specific area in Central Saanich, on Senanus Drive has been identified as the model for this part of the study. This area is unserviced and has existing potable water supply issues with private well-owners reporting quality and quantity problems, and seeking a hook-up to an expanded centralized system.

For both projects, the use of reclaimed water for irrigation provides the opportunity to

i) reduce demands on existing potable water treatment and distribution infrastructure,

ii) reduce discharge of effluent to a marine environment, and

iii) demonstrate appropriate infrastructure to treat and distribute reclaimed water.

The projects fit the "wastewater treatment services" category as they will include an analysis of the treatment required to make the effluent from the existing Unified Treatment Plant suitable for agricultural irrigation, and groundwater from a small, local service area recyclable for outside home use.

The projects fit the "water distribution and/or water conservation" category as they deal with the feasibility of using reclaimed water for irrigation. For every litre of reclaimed water used, a litre of potable water is saved. This reduces the potable water demand during the dry summer season when existing potable supplies (and distribution systems) are under maximum demand.

The environmental objective of increasing the environmental effectiveness of the municipal water treatment and distribution system will be met by demonstrating the feasibility of diverting irrigation demand from conventional (potable water) sources to reclaimed water sources. There is a 100% increase in effectiveness achieved by diverting demands.

The proposed project will:

- determine existing regulatory requirements for the use of reclaimed water for irrigation, and for the development of a small-scale multipurpose communal facility
- establish irrigation demands on the Saanich Peninsula, based on crop, type, agricultural practices, and geographic location
- determine treatment requirements necessary to enable use groundwater in a communal system, of Unified Treatment Plant effluent for irrigation, and of recycled water for outdoor household use
- examine infrastructure requirements for distribution of communal fresh and communal and large-scale reclaimed water, including conventional and non-conventional practices

DRAFT

- determine impact of diversion of irrigation water on existing potable water treatment and distribution infrastructure
- determine infrastructure costs for both projects
- examine social impacts of utilizing reclaimed water for irrigation (acceptance by agricultural community, acceptance by consumer, regulatory and monitoring requirements, etc.)

The goal of the study is to provide a document that can provide the basis for implementing these projects which can serve as demonstration projects for other locations.

Project contact at partner organization

Name David Featherstonhaugh, P.Eng.

Title Vice President , Wastewater and Marine Systems

Telephone (250) 655-3348 E-mail dfeatherstonhaugh@hydroxyl.com

Project description

GMEF supports feasibility studies that assess the technical, engineering, environmental and/or economic viability of proposed municipal environmental projects aimed at improving energy or process efficiency in municipal buildings, and water, wastewater, municipal solid waste and public transit systems.

Project title Rural/Urban Wastewater Re-use and Self Contained Water System Project

Start date Upon notification of funding Completion date 4 months after start Length (months) 4

Project categories

Please indicate which of the following categories the proposed project will address:

- ❑ Energy services such as community energy systems, waste heat capture or landfill gas recovery
- ❑ Municipally-owned and/or operated buildings and facilities
- ❑ Public transportation technologies and/or fleets
- ❑ Renewable energy technologies
- ❑ Solid waste management
- ❑ Storm runoff management
- ☒ Wastewater treatment services
- ☒ Water distribution and/or water conservation
- ❑ Other: Please identify _____

Environmental objectives

Please indicate which of the following statements best represents the project. The proposed project will:

- ❑ Significantly reduce (e.g., 35 – 50 per cent below business as usual) the energy and/or emissions intensity of the municipal service targeted
- ☒ Significantly increase (e.g., 35 – 50 per cent above business as usual) the environmental effectiveness of the municipal service targeted

Estimated cost of feasibility study

The GMEF will cover up to 50 per cent of the cost of feasibility studies. The remaining 50 per cent of funding can come from the municipal government and/or other project partners.

Green Municipal Enabling Fund (GMEF)
Intent to Apply

Summary

The proposed project is oriented to providing green infrastructure for a rural municipality on the urban fringe of the Saanich Peninsula adjacent to Victoria, B.C. The infrastructure is of two types which, combined, would effectively contain urban sprawl. On the one hand, one aspect of the proposal would both strengthen the municipality's agricultural base; on the other, the proposed infrastructure would meet residential needs with innovative infrastructure that would not foster sprawl. Both projects would offer significant benefits for the reduction of greenhouse gases, and would dramatically increase the efficiency of water use..

The District of Central Saanich, located on the Saanich Peninsula of Vancouver Island, is a diverse mixture of agriculture, rural development (unserviced), rural development (water services only), and urban (serviced) development.

Two infrastructure are to be considered.

The first is the use of a large communal wastewater facility as the source of re-use water, with distribution of re-use water over a large geographic area to service agricultural needs. The two key components, a source of wastewater treatment plant effluent and agricultural activity, are both available on the Peninsula.

The second is a small, self-contained, water system based on local groundwater.. The proposed, small-scale communal system would provide clean drinking water for a small localized area and, with the purification of the wastewater produced, also provide recycled water for gardening and irrigation needs. This model also provides the opportunity to reduce potable water demands (through the expansion of the traditional centralized supply system) by diverting irrigation water from potable systems. A specific area in Central Saanich, on Senanus Drive has been identified as the model for this part of the study. This area is unserviced and has existing potable water supply issues with private well-owners reporting quality and quantity problems, and seeking a hook-up to an expanded centralized system.

For both projects, the use of reclaimed water for irrigation provides the opportunity to

i) reduce demands on existing potable water treatment and distribution infrastructure,

ii) reduce discharge of effluent to a marine environment, and

iii) demonstrate appropriate infrastructure to treat and distribute reclaimed water.

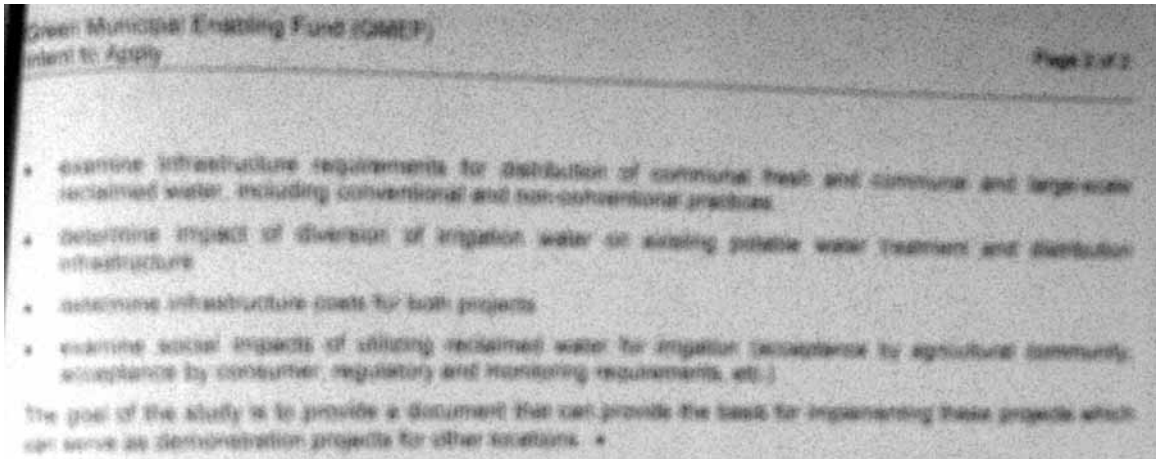
The projects fit the "wastewater treatment services" category as they will include an analysis of the treatment required to make the effluent from the existing Unified Treatment Plant suitable for agricultural irrigation, and groundwater from a small, local service area recyclable for outside home use.

The projects fit the "water distribution and/or water conservation" category as they deal with the feasibility of using reclaimed water for irrigation. For every litre of reclaimed water used, a litre of potable water is saved. This reduces the potable water demand during the dry summer season when existing potable supplies (and distribution systems) are under maximum demand.

The environmental objective of increasing the environmental effectiveness of the municipal water treatment and distribution system will be met by demonstrating the feasibility of diverting irrigation demand from conventional (potable water) sources to reclaimed water sources. There is a 100% increase in effectiveness achieved by diverting demands.

The proposed project will:

- determine existing regulatory requirements for the use of reclaimed water for irrigation, and for the development of a small-scale multipurpose communal facility
- establish irrigation demands on the Saanich Peninsula, based on crop, type, agricultural practices, and geographic location
- determine treatment requirements necessary to enable use groundwater in a communal system, of Unified Treatment Plant effluent for irrigation, and of recycled water for outdoor household use



- Examine infrastructure requirements for distribution of commu