



THE CITY OF WINNIPEG
WATERWORKS, WASTE, AND DISPOSAL DEPARTMENT

1500 PLESSIS ROAD • BOX 178 TRANSCONA P.O. • WINNIPEG • MANITOBA • R2C 2Z9

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IN REPLY PLEASE REFER TO

1990 02 26

Manitoba Environment
Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

ATTENTION: Mr. N.B. Brandson, P.Eng., DIRECTOR OF ENVIRONMENTAL MANAGEMENT SERVICES

Dear Sir:

RE: ENVIRONMENT ACT PROPOSAL FOR THE SOUTH END WATER POLLUTION CONTROL CENTRE - Our Files ST-3.2 & SE 2-9(C)

In accordance with the request of November 14, 1989 from the Honourable J. Glen Cummings, Minister of Environment to His Worship, Mayor William Norrie, please find enclosed 20 copies of an Environment Act proposal for the South End Water Pollution Control Centre (SEWPCC). This proposal is submitted pursuant to Section 11(6) of the Act for the existing development.

The SEWPCC is currently in the process of being expanded. Approval pursuant to Section 14(2) of the Environment Act was granted on August 24, 1989 for the primary clarifier expansion. The remainder of the Stage I expansion is expected to commence with tendering of the secondary process expansion by the summer of 1990 with contract work continuing into 1993.

It is our understanding that the public hearings which will establish water quality objectives to be used for setting sewage treatment plant discharge requirements will take place in the fall of 1990. Since it is anticipated that the issuance of licences for the existing sewage treatment plants will occur after establishment of the discharge requirements, and since it is proposed that the existing and expanded facilities be included under this proposal it is respectfully requested that for the interim period the remainder of the SEWPCC Stage I expansion project be approved pursuant to Section 14 before June 1, 1990.

Please contact Mr. B.D. MacBride at 986-4434 if you have any further requests regarding this application.



WINNIPEG
..where the New West begins.

Yours truly,



W.J. Borlase, P.Eng.
Acting Director

EJS/lw
attach.

cc: L. Strachan, P.Eng.
R.J. McRae, P.Eng. Commissioner of Works and Operations
B.D. MacBride, P.Eng.
G. Rempel, P.Eng. Wardrop/MacLaren

Environment Act Proposal Form

Manitoba
Environment and
Workplace Safety
and Health



This form prescribes the nature and sequence of the information required to file a proposal for a development pursuant to subsections 10(3), 11(7), and 12(3) of the Manitoba Environment Act.

Name of development South End Water Pollution Control Centre		OFFICE USE ONLY Date Received <u>Mar. 2/90</u> Client File Number <u>1069.00</u> Development Review Class <u>2</u> Region <u>City of Wpg</u> Department Contact Person <u>LARRY STRACHAN</u> Phone Number <u>945-7071</u>
Name of the proponent of the development City of Winnipeg; Waterworks, Waste and Disposal Department		
Location (city, town, legal description) Lot 149 St. Mary's Road; SE Corner of ST. Mary's & Perimeter		
Name of principal contact person for purposes of the environmental assessment Mr. B.D. MacBride, P.Eng.		
Mailing address 1500 Plessis Road, Box 178 Transcona P.O.	Postal code R2C 2Z9	
Winnipeg, Manitoba	Telephone 986-4434	
Date February 25, 1990	Signature of Contact Person <i>B MacBride</i>	

(The proponent should reproduce the underlined portions of each section as noted below adding the required information following each section).

DESCRIPTION OF THE DEVELOPMENT:

- i) Certificate of Title showing the legal description of the development; or in the case of highways, rail lines, electrical transmission lines, or pipelines a map or maps at a scale no less than 1:50,000 showing the location of the proposed development:
- ii) Name of the owner(s) of the land upon which the development will be constructed:
- iii) Name of the owner of Mineral Rights beneath the Land if this is not the same as the surface owner:
- iv) Description of the existing land use on the site and adjoining it as well as changes that will be made thereto for the purposes of the development:
- v) Land use designation for the site and adjoining land as identified in a development plan adopted pursuant to the Planning Act or the City of Winnipeg Act and the zoning designation as identified in a Zoning By-Law, if applicable:
- vi) Description of the previous studies and activities relating to feasibility, exploration, or project siting and prior authorization received from other government agencies:
- vii) A description of the proposed development and the method of operation including hours of operation:
- viii) A description of the potential impacts of the development on the environment, including, but not necessarily limited to:
 - type, quantity and concentration of pollutants to be released into the air, water or land
 - impact on wildlife
 - impact on fisheries
 - impact on surface water, and groundwater
 - forestry related impacts
 - impact on heritage resources
 - socio-economic implications resulting from the environmental impacts

- ix) A description of the proposed environmental management practices to be employed to prevent or mitigate adverse implications from the impacts identified in (viii) which will have regard to, where applicable: containment, handling, monitoring, storage, treatment and final disposal of pollutants; conservation and protection of natural or heritage resources; environmental restoration and rehabilitation of the site upon decommissioning; and protection of environmental health.

SCHEDULE:

- i) The date of commencement of construction, commencement of operation including staging of the development and termination of operation, if known:
- ii) Latest date by which the proponent would like to complete the requirements of the Environment Act and seek approval for the development. Briefly state the reasons for the selection of this date.

FUNDING:

Name and address of the the Government Agency (Federal, Provincial or otherwise) from which a grant or loan of capital funds have been requested, where applicable.

NOTE:

The Environment Act requires that subject to the Confidential Information clause, Section 47, a proposal shall be filed in the public registry.

Proprietary information provided in this form should be clearly noted. A separate summary of the proposal excluding the proprietary information should accompany the proposal for the public registry file.

The completed Proposal Form should be sent together with a covering letter to:

Environmental Management Division
Department of Environment and Workplace
and Safety and Health
Box 7, Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

ENVIRONMENTAL ACT PROPOSAL FORM
CITY OF WINNIPEG
SOUTH END WATER POLLUTION CONTROL CENTRE

DESCRIPTION OF THE DEVELOPMENT

i) Certificate of Title

A copy of the Certificate of Title showing the legal description of the land is appended to this proposal as Appendix 1.

ii) Owner of the Land

The owner of the land is the City of Winnipeg.

iii) Owner of Mineral Rights

The owner of the Mineral Rights beneath the land is the City of Winnipeg.

iv) Existing Land Use

The existing land use on the site is a wastewater treatment plant, the South End Water Pollution Control Centre. No changes to this land use will be made for purposes of the development. The subject site includes over 170 hectares which are leased for agricultural use to the east and west of the treatment facility as well as over 30 hectares on the north and south dedicated to City use. Adjoining land uses to the south, east and west are primarily agricultural with some large lot residential development as permitted within the "A1-Agricultural District" zoning designation. Lands immediately north of the Perimeter Highway north of the site have agricultural uses while urban residential development exists approximately one kilometre from the treatment facility proper.

v) Land Use Designation

The land use designations for the site and the adjoining lands are established by City of Winnipeg By-Law No. 2960/81- "Plan Winnipeg" as shown by the drawing enclosed as Appendix 2. The land use designation for the subject site as established by "Plan Winnipeg" is Large Lot Residential Development Area". Lands to the south to the Red River floodway, to the east to Lagimodiere Boulevard, and to the west to the Red River also bear this land use designation. Lands north of the Perimeter Highway are designated as "Suburban Residential".

Additionally, under "Plan Winnipeg", development within one kilometre of Water Pollution Control Centres is subject to the following policy which is quoted verbatim from By-Law 2960/81:

"CHAPTER: WATER, WASTE AND DISPOSAL

SECTION: SEWERAGE AND POLLUTION CONTROL SYSTEM

SUBJECT: ODOUR CONTROL

61(1) POLICY

- (a) The City shall, through the development approval process and land use controls, regulate all development within the development control lines around wastewater treatment plants and facilities, as defined on the Map attached to this By-law and marked "Plan Winnipeg Policy Areas," in order to minimize the impact of odour emissions on adjoining land uses; and
- (b) The City shall ensure that whenever a major wastewater treatment plant or facility requires expansion or modification, an analysis of odour control methods is included in the expansion design including a review of the separation areas defined by the development control lines on the Map attached to this By-law and marked "Plan Winnipeg Policy Areas."

61(2) OBJECTIVE

To minimize the impacts of odour emissions from wastewater treatment facilities upon living and working areas."

This policy has been applied in the case of the development to the north of the Perimeter Highway. The development agreement for the area restricts development within one kilometre of the plant until the complete odour control works, associated with the expansion are complete and a one year field evaluation is completed. The evaluation is expected to be complete in late 1992.

The St. Vital Town Planning Scheme 1951 provides zoning designations for the subject site and adjacent lands as shown in Appendix 3. The site is designated "A1" Agricultural District.

vi) Previous Studies and Activities

The South End Treatment Facility opened in 1974. The opening of the South End Plant marked the completion of the City's objective to collect and provide secondary treatment of sewage from the area in south Winnipeg. Pollution control is carried out by pretreatment, primary treatment and high purity oxygen-activated sludge secondary treatment.

The total number of reports written on the South End facility held in this department's library is 81. The listing provided herewith indicates several

main reports related to the planning, design and operation for the major works and expansions of the South End Plant. Copies of the report listed below and a copy of the listing of all reports are available upon request. A separate listing of reports written on the Red and Assiniboine Rivers is also available upon request.

Odour Study: South End Water Pollution Control Centre, 1984.

Author: Waterworks, Waste & Disposal Dept.

Subjects:

1. Odour Sources
2. Odour Analysis

Conceptual Design Study: Expansion Requirements of South and West End Water Pollution Control Centres, 1986.

Author: MacLaren Engineers Inc.

Subjects:

1. Wastewater Flows & Characteristics
2. Existing Facility Description
3. Expansion Requirements

Odour Control Assessment: South End Water Pollution Control Centre, 1988.

Author: MacLaren/Wardrop Engineers

Subjects:

1. Existing Odour Conditions
2. Future Odour Conditions
3. Plant Ventilation Design

Functional Design Report: South End Water Pollution Control Centre, 1989.

Author: MacLaren/Wardrop Engineers

Subjects:

1. Existing Conditions
2. Ultimate Development
3. Process Description

vii) Description of the Proposed Development and the Method of Operation

The SEWPCC is a secondary sewage treatment plant with the following processes:

- Main Pumps
- Screening
- Aerated Grit Removal
- Primary Clarifiers
- Oxygen Activated Sludge
- Secondary Clarifiers
- Sludge Storage and Hauling to the NEWPCC

A fact sheet on the SEWPCC giving capacities for these processes is attached as Appendix 4. Appendix 5 includes planning data on population served and the trend in flows. Detailed descriptions of the facility and drawings are available as outlined in vi) above, previous studies and activities. A plan of the existing facility and expansion is attached as Appendix 6.

The plant is operated continuously, 24 hours a day, 365 days a year. Operating and maintenance staff work a regular five day week. The facility is not manned at nights and on weekends. Two operators and an instrument technician are on standby when the plant is not occupied.

The facility has a staff as follows:

Supervisory	1
Senior Operator	1
Operator	3 (1)
Assistant Operator	2
Maintenance (Mechanical, Electrical)	4 (4)
Process Control	0 (1)
Support	3 (4)
Laboratory	<u>1</u>
Total	15 (10)

Numbers in brackets are proposed additional staff for the expanded plant as discussed below under proposed development.

The SEWPCC was designed with a capacity of 45 ML/d average flow which was for 1981 expected flows. Both the primary and secondary processes were designed for a peak flow of 2.5 times that or 112 ML/d. However, based on actual operating experience, the capacity of the secondary is restricted to 82 ML/d.

The plant has a number of automatic control loops to allow consistent operation through varying flow conditions. Servicing and breakdowns can reduce capacity. The plant is designed so that process units can be taken out of service and treatment can be provided by the remaining process units. Routine maintenance is timed to occur at low flow periods.

Proposed Development

An engineering study has recommended the expansion of the SEWPCC be in two stages. Stage I of the expansion will approximately double the existing infrastructure and will include the following:

- one 51.9m by 19.2m rectangular primary clarifier *
- two oxygen reactors
- a new oxygen generation PSA unit approximately equal in size to the existing unit
- one new circular 45m diameter secondary clarifier
- one 45m high odour dispersion stack as well as all related ventilation systems required to discharge process air streams to the stack *
- a distributed digital control system for automated process and ancillary control as well as monitoring
- several upgrades to enhance the plant operation and reliability including in-plant odour control through pre-chlorination, standby power, and upgrading of the raw sewage pumps

- liquid waste haulers' disposal facility (under review) *

* previously approved.

A detailed description of the proposed development is included in the functional design report listed in vi) above. The Stage I expansion is currently underway and is expected to continue into 1993. The treatment process sizing is based on providing the best practicable secondary treatment. Peak 30 day averages of 25 mg/L BOD5 and 30 mg/L SS were selected as the process design basis.

Stage II of the project will include expansion of the grit removal process as well as further expansion to the primary and secondary treatment processes. Implementation of the Stage II expansion will be deferred until justified by an increase in the wastewater flow rates. Please note that the City is requesting approval of Stage I only at this time. Stage II is mentioned since the above reports include discussion of Stage II.

viii) Description of the Potential Impacts of the Development on the Environment

The purpose of the SEWPCC is to protect the aquatic environment of the Red River. This is done by treating raw sewage to produce an effluent amenable to discharge into the river. In this sense the SEWPCC has an important positive impact on the environment.

Residual pollutants from the treatment of raw sewage are released into the environment from the SEWPCC. These include the liquid effluent released into the Red River, and odorous air streams released to the atmosphere, and noise. Of these only the liquid effluent has not been dealt with and licensed under the Clean Environment Act. Odour and noise emissions are covered by Clean Environment Commission Order 1190.

Process control and effluent parameters are monitored daily from Sunday to Thursday using 24 hour composite samples. Appendix 7 attached details the monitoring that is done and includes a summary of plant operation and quality of discharges for 1989. Detailed daily data is available upon request.

The impacts of the discharge of treated sewage effluent are considered to be most significant on surface water quality and on aquatic life in the Red River. Impacts on wildlife, groundwater, forestry, heritage resources, and socio-economic impacts from sewage treatment are, to our knowledge, not significant.

The City and other agencies have carried out numerous studies of the impact of liquid discharges on the Red River. In general, typical of all major wastewater treatment plants, the impacts of the effluent are as follows:

1. Sewage effluent has a biochemical oxygen demand (i.e. is biodegradable). This biodegradation uses oxygen in a stream and lowers the dissolved oxygen of the surface water. It is important that the dissolved oxygen levels remain above that required to support the most sensitive species of fish.

2. Sewage effluent from the SEWPCC contains ammonia which is also toxic to fish above certain concentrations.
3. Sewage effluent contains nitrogen and phosphorus which may promote algae and weed growth in the surface water.
4. Sewage effluent contains microbiological discharges, bacteria and pathogens which raise the concentration of these in the river.
5. Sewage effluent contains low levels of other pollutants such as heavy metals, pesticides and other organics.

Assessment of the impact of these effluent on the river are done in two major ways:

- 1) Direct monitoring of the river (see section ix below); and
- 2) Use of calibrated computer models.

Recent receiving stream assessments by the City include

1. "Report on Pollution Abatement and River Quality Study" - James F. MacLaren Limited, November 1979.
2. "Conceptual Design Study - Expansion Requirements of South and West End Water Pollution Control Centres" report to City of Winnipeg by MacLaren Engineers. November 1986.

Chapter 5.0 - Receiving Stream Assessment
Appendix D - Receiving Stream Assessment

3. Disinfection Evaluation: "City of Winnipeg Wastewater Treatment Plant Effluent". Report to City of Winnipeg, Province of Manitoba by MacLaren Engineers. October 1986.

These assessments carefully document the impacts of effluent on the river. The first two reports deal with dissolved oxygen and nutrients. The third deals with microbiological discharges.

The City has also retained a consultant to prepare a study and update the City's river quality model in preparation for the Clean Environment Commission hearings on establishing water quality for the Red and Assiniboine Rivers. This study will involve defining existing, and projecting future land uses, to establish point and non-point discharges to the rivers for input to the model. The model will be utilized to simulate existing and future river quality regimes in consideration of various pollution control options. Implications of enhanced river uses with associated pollution control strategies including infrastructure requirements, land use strategies, costs, and benefits will be assessed, and water quality objectives recommended.

ix) Proposed Environmental Management Practices

The operation of the South End Water Pollution Control Centre is in itself an environmental management practice with respect to water pollution impacts due to disposal of wastewater from the City of Winnipeg. Therefore, the sole additional environmental management practice related to water discharges is the monitoring of the process functions within the South End Water Pollution Control Centre and of river water quality both upstream and downstream of this facility.

River water quality is monitored bi-weekly at six locations on the Red River from the South Floodway control structure to Lockport. A typical report is included as Appendix 8. No monitoring of the Red River is undertaken in late fall and early spring because safety considerations preclude monitoring.

As there are no land impacts due to the South End Water Pollution Control Centre, no environmental management practices are proposed.

Air emissions from the South End Water Pollution Control Centre are odour and noise. These are controlled under Clean Environment Commission Order No. 1190, dated March 30, 1988. Monitoring of odour and noise is undertaken in accordance with this license.

The City is also considering future treatment and other improved environmental management practices to protect the rivers. These are highlighted in the attached brochure titled "Winnipeg's Wastewater Treatment Program, Past, Present & Future", included as Appendix 9.

SCHEDULE

i) Date of Commencement of Construction, Operation

Construction of the SEWPCC expansion is currently in progress. Approval pursuant to Section 14(2) of the Environment Act has been granted for the primary clarifier expansion. The remainder of the Stage I expansion is expected to commence with tendering of the secondary process expansion by the summer of 1990, with contract work continuing into 1993. A schedule of the proposed construction activities is included as Appendix 10. The proposal for the existing development contained herein includes the expansion project.

The existing SEWPCC facility has been operational since 1974.

ii) Latest Date to Complete the Requirements of the Environment Act

To avoid delays to the proposed construction schedule, it is requested that the remainder of the Stage I expansion project be approved (by June 1, 1990) pursuant to Section 14 of the Environment Act.

It is suggested that the issuance of a licence for the SEWPCC be deferred until after the public hearings concerning water quality objectives, since the

hearings will provide the basis for setting sewage treatment plant discharge requirements.

FUNDING

Grant or Loan of Capital Funds

All funding for this project is through the City of Winnipeg Sewer Utility. No grants or loans from a Federal or Provincial Agency have been requested.