

CITY OF BURNABY
ENVIRONMENT AND WASTE MANAGEMENT COMMITTEE

HIS WORSHIP, THE MAYOR
AND COUNCILLORS

RE: STRIDE AVENUE LANDFILL CLOSURE PLAN PROGRAM - PHASE 1

RECOMMENDATIONS:

1. THAT Council endorse the four phase Stride Avenue landfill closure plan as outlined in the attached report.
2. THAT Council authorize staff to proceed with detailed engineering design for Phase 1 of the closure plan which includes the installation of a permanent landfill gas extraction system; and
3. THAT Council authorize staff to expend \$90,000 for the field investigation and engineering design services required for the landfill gas management phase of the closure program.

R E P O R T

The Environment and Waste Management Committee, at its meeting held on 1995 March 14 received and adopted the attached report providing details of a phased closure plan for the Stride Avenue landfill and to request approval to proceed with the detailed engineering design for Phase 1 of the plan.

The Committee therefore places the recommendations before Council for approval.

Respectfully submitted,

Councillor D. Drummond
Chair

Councillor D. Johnston
Member

: COPY - CITY MANAGER DESIGNATE
- DIRECTOR ENGINEERING
- DIRECTOR FINANCE
- DIR. PLNG. AND BLDG.
- DIR. REC. & CULT. SERV.
- MEDICAL HEALTH OFFICER
- CHF. ENVIR. HLTH. OFFICER

Councillor D. Lawson
Member

TO: CHAIRPERSON & MEMBERS
ENVIRONMENT & WASTE
MANAGEMENT COMMITTEE

DATE: 1995 03 06

FROM: DIRECTOR ENGINEERING

FILE: 60-07-03

SUBJECT: STRIDE AVENUE LANDFILL CLOSURE PLAN PROGRAM - PHASE 1

PURPOSE: To present a phased closure plan for the Stride Avenue landfill and to request approval from the Committee and Council to proceed with the detailed engineering design for Phase 1 of the plan.

RECOMMENDATION:

1. THAT the Environment & Waste Management Committee recommend to Council that:
 - a) the four phase Stride Avenue landfill closure plan as outlined in the report be endorsed;
 - b) staff be authorized to proceed with detailed engineering design for Phase 1 of the closure plan which includes the installation of a permanent landfill gas extraction system; and
 - c) staff be authorized to expend \$90,000 for the field investigation and engineering design services required for the landfill gas management phase of the closure program.

REPORT

SUMMARY

The Stride Avenue landfill had been used as a municipal solid waste disposal site from approximately the early 1900's to the late 1960's. Since its closure to refuse disposal, the landfill site has been used for Burnaby residents only yard waste disposal and has been accepted by the public as a convenient facility to dispose of bulky yard waste. The yard waste operation at the landfill site provides an effective and low cost method of diverting a significant volume of garden waste from the municipal waste stream.

However, recognizing the development growth in the Edmonds area and the need to convert the former landfill site to a land use that reflects the goal of the Edmonds Town Centre Plan, a permanent closure program must be put in place to redress the site and remediate the environmental concerns related to landfill gas and leachate discharges.

To meet the land use objective, a four phase closure plan is proposed for the landfill site to address the gas migration, leachate control, alternate yard waste disposal and final landfill surface treatment issues. The proposed phased program provides an integrated approach and offers a total solution to the land use issue. The proposed program is flexible and each phase of the closure program can be addressed separately and independently. The first phase of the closure program would include the implementation of a gas extraction system. The extraction method would provide an effective means of controlling the methane gas migration problem and offers the best long term solution.

To expedite the implementation of the gas management system, it is recommended that staff be authorized to proceed with the detailed engineering design work for the first phase. Further reports will be submitted to the Committee and Council outlining details of the construction phase including funding requirements and presenting as appropriate, additional information with respect to the detailed plan, schedule, and cost of the remaining phases of the closure plan.

1.0 INTRODUCTION

The Stride landfill is located to the east of Southpoint Drive (formerly Stride Avenue) and to the south of the SkyTrain corridor as shown in Figure 1. Based on interpretation of historic aerial photographs, records, and vegetative growth in the area, the use of the site for waste disposal may have started in the early 1900's.

The disposal of municipal type solid waste at Stride continued until approximately the late 1960's. Since that time, the landfill operation has been closed and only garden waste from Burnaby residents and construction waste from City operations are accepted at the site.

In the late 1980's, the concern of landfill gas generation and migration was recognized and subsequently led to the construction of an air injection and barrier system in 1990 to provide short term relief to the gas migration problem. As part of the remedial program, ongoing methane gas monitoring work was also initiated to monitor the extent of the gas migration and to provide data for future implementation of the permanent system under the final closure plan.

Based on results of the monitoring program and preliminary field investigative work, a long term closure plan has now been developed and the key components of the plan are outlined in this report. The purpose of this report is to seek Council's approval in principle of the multi-phase program and to obtain Council's authority to proceed with Phase 1 of the program.

2.0 CURRENT LAND USE AND FUTURE LAND USE

Based on interpretation of historic aerial photographs, it appears that the past waste disposal operation covered about 14.5 ha (35.8 ac) of land and the approximate boundary of the landfill site is shown on Figure 1. The current yard waste operation is located in the area south of the Mission Avenue right-of-way between Southpoint Drive and 14th Avenue right-of-way. The yard waste operation is open to all Burnaby residents, 7 days a week except statutory holidays, between the hours of 8:30am and 3:30pm. On the yearly average, the site receives 80 car/pick-up/truck loads of yard waste per day, up to a peak of over 200 vehicle loads per day during summer weekends.

Under the recently adopted Edmonds Town Centre Plan, the Stride landfill site is designated for future park and open space development. The existing 14th Avenue ravine south of the landfill would be preserved in its natural state. With development continuing to take place in the vicinity of the landfill, it is recognized that the landfill site must be remediated in accordance with established environmental regulations and transformed into a land use compatible with existing and proposed development in the area.

3.0 ALTERNATE YARD WASTE PROGRAM

In support of the Provincial goal of reducing the municipal waste stream by 30% and 50% by the years 1995 and 2000, respectively, Council has endorsed and implemented solid waste initiatives such as single family/multi-family recycling, backyard composting, and recycling depot.

Notwithstanding the fact that the current yard waste operation at Stride is well received by the public and provides an excellent means of diverting a significant volume of yard waste from the municipal waste stream, the landfill must be closed and remediated in order to create a land use that is compatible with the community plan. In order to meet the waste reduction goal and the Stride landfill closure objective, staff are examining the feasibility of an alternate City-wide limited duration curbside yard waste collection program in 1995 and continuing to develop an effective communication to better inform the public on waste reduction opportunities.

Results of the yard waste pilot program to be conducted in the Fall of 1995 will be the subject of a future staff report to the Committee and Council. The report will outline the long term yard waste management strategy that would replace the current Stride operation and its financial and land implications. In the meantime, it is important that the City continues with its yard waste operation at Stride in the interim until an alternate strategy is developed and implemented.

4.0 LANDFILL CLOSURE PLAN

Under the Ministry of Environment regulations, a landfill closure plan must be prepared in accordance with the established environmental criteria and post-closure monitoring requirements. In order to develop a plan that would meet the regulatory requirements and offer a total solution within the financial constraints, an integrated multi-phase approach is recommended. The various components required to be addressed under the closure plan are: landfill gas migration, leachate control, landfill cover, re-vegetation, and ongoing monitoring. Therefore, it is important that the final plan be constructed in such a way that each of the components can be addressed independently and implemented over a period of time.

Currently, staff are conducting a comprehensive environmental monitoring program which includes landfill gas and ground/surface water sampling tasks. The program will be expanded as necessary in the future to meet the Ministry's post-closure requirements. To execute an effective closure program for the Stride landfill, it is recommended that the following four phase closure strategy be endorsed:

- Phase 1 - Implementation of a Gas Management System
- Phase 2 - Implementation of a Leachate Control System
- Phase 3 - Implementation of an Alternate Yard Waste Disposal/Collection System
- Phase 4 - Implementation of a Final Landfill Cover and Re-Vegetation Program

As a first step of the closure strategy, staff are recommending to proceed with Phase 1 of the program which is discussed in more detail in the following section. As more data is obtained from the current environmental monitoring program, further reports will be submitted to the Committee and Council outlining the action plan, schedule, and costs for the implementation of the remaining phases of the closure plan.

5.0 PHASE 1 - GAS MANAGEMENT SYSTEM

5.1 Existing Gas Management System

The biodegradation of organic wastes in a landfill produces landfill gas which consists primarily of methane and carbon dioxide. Methane is a combustible gas and is lighter than air. The main concern of landfill gas is often related to migration of methane gas into facilities adjacent or within the landfill that may create an explosive hazard. Under the Ministry of Environment regulations for landfill operation, landfill gas management is required to control the potential gas hazard within and beyond the landfill site.

As a part of the methane gas migration control program, the City in 1989 to 1991 installed a system of gas barrier and air injection wells. The purpose of the system is to create a pressurized curtain at the landfill boundary to provide protection to existing residential development directly across from the landfill site, on the north side of Southpoint Drive.

The objective of the air injection system is to produce a pressurized perimeter barrier at the edge of the landfill to restrict methane migration. The air injected into the ground through the injection wells also promoted aeration in the refuse deposited near the wells, thereby creating an aerobic condition that would curtail the generation of methane-producing bacteria. Although the air injection system provides an effective means of restricting methane gas migration to the landfill, a permanent system of collecting and treating the landfill gas should be implemented as part of the final closure plan.

One component of the landfill closure plan is the installation of an impermeable cover to reduce surface run-off infiltration into the underlying waste to minimize leachate generation. Such cover would also prevent the gas from escaping into the atmosphere thus trapping the methane gas beneath. Therefore, as the first step of the closure program, it is necessary that a permanent active methane gas control system be installed to address the long term landfill gas problem.

5.2 Proposed Landfill Gas Management System

In order to implement a gas management system compatible to the long term landfill closure strategy, it is recommended that the existing air injection system be upgraded. Several gas management alternatives were examined and the conclusion suggests that an extraction system would meet the long term objective and provide an excellent means of collecting and removing the methane gas in a controlled manner.

The proposed extraction system would convert the existing injection wells to extraction wells. Additional extraction wells would be constructed to improve control of gas migration and a new exhaustor/gas treatment device would also be installed.

The design and construction of the program would take approximately 9 to 12 months to complete. To facilitate the installation of the extraction wells and the associated underground work and to achieve an optimum construction schedule, it is recommended that the engineering design program be initiated immediately. The construction of the gas extraction system would also reduce the extent of any special on-site gas migration control measures that otherwise may be required at the planned City development sites on the north side of Southpoint Drive. Early completion of the gas management system at the landfill would also allow staff to evaluate the performance of the system and make the necessary system adjustments to achieve optimum operation and maximum control of the gas generation and migration problem prior to development taking place on the City land and on the former landfill site.

5.3 Funding

The estimated design and construction cost of the recommended gas management system is approximately \$760,000. The actual cost of the system would largely depend upon the extent of the extraction network and the number of additional wells required.

The 1995-1999 Provisional Capital Budget provides funding for the Stride landfill closure plan. The 1995 program contains a provision of \$500,000 for initiation of the gas management system. It is recommended that staff be authorized to expend \$90,000 for the field testing and design services required for the proposed gas management system.

6.0 CONCLUSION

Recognizing the long term objective of closing the former landfill site at Stride in accordance with the community adopted land use plan, it is necessary to implement a multi-phase closure program to address the environmental issues generated by past operations at the landfill.

Methane gas is often associated with landfill gas generated by the biodegradation of organic wastes in a landfill. The existing air injection and barrier system installed at Stride landfill provides an interim control measure to reduce the migration of methane gas beyond the landfill boundary.

With due consideration to public safety and the final landfill cover requirement, it is recommended that an enhanced gas management system employing an extraction process be implemented to provide a permanent collection and disposal solution to the methane gas issue. Under the recommended scheme, the existing air injection wells can be converted and used as extraction wells to form part of the permanent system. The estimated cost of the upgrading is approximately \$760,000. To expedite the implementation of the closure plan, it is recommended that the four phase strategy be endorsed by Council and staff be authorized to proceed with the design phase of the gas management component. Further reports will be submitted to the Committee and Council on the schedule and cost of the subsequent phases. Detailed funding requirements for the construction phase of the gas system will also be submitted to Council for budget approval when the engineering design and detailed cost estimates are complete.


DIRECTOR ENGINEERING

LSC:jb

Attach.

cc: City Manager
Director Finance
Director Planning & Building
Director Recreation & Cultural Services
Chief Environmental Health Officer

