

9.1.7

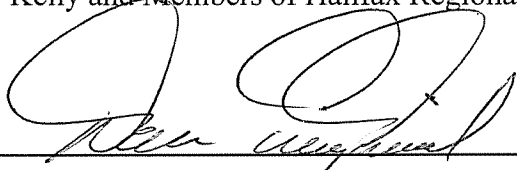


PO Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Halifax Regional Council
July 6, 2004

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY:



Dan English, Acting Chief Administrative Officer

DATE: June 22, 2004

SUBJECT: Capacity at Eastern Passage Waste Water Treatment Plant

ORIGIN

Request from Regional Council April 20, 2004, to comment on status of recent "By-Right" Subdivision Concept Applications and the capacity at Eastern Passage Waste Water Treatment Plant.

RECOMMENDATION

It is recommended that Regional Council commit in principle to completion of the required upgrades at the Eastern Passage Waste Water Treatment Plant by 2008 subject to consideration by Regional Council of the Annual Budgets. The upgrades will allow for continued growth within the existing service boundary of Eastern Passage and Cole Harbour and accommodate an anticipated increase in treatment level as indicated by Nova Scotia Department of Environment and Labour.

BACKGROUND

The Eastern Passage Waste Water Treatment Plant was designed and built in 1974 providing a *secondary* level of treatment. In 1986 an expansion to the plant occurred resulting in an increase in the service boundary and a decrease in the level of treatment to *primary*. At both times design standards were based on the plant accommodating *dry weather flows*. As a result, *during rain events* the plant will experience overflows. Today's design standards include greater allowances for *average wet and dry weather flows*. HRM's current commitment for treatment levels at Eastern Passage complies with the older environmental standards. To meet standards of today, an upgrade to *secondary treatment* will be required with an expansion of that facility.

The volume of sewage flow entering the Eastern Passage Treatment Facility is approaching the design capacity. Staff recently became aware of this, and although subdivision applications have not been refused as a result of this, staff have taken the full 90 days permitted to review the applications, conduct the necessary analysis and update Council on the status of the treatment plant which is the subject of this report.

- Based on the rate of development over the past 5 years, there is capacity at the Eastern Passage Treatment Plant to accommodate approximately 2 more years of development. The trend is a growth rate of approximately 640 persons per year. Staff have approved and/or received applications that could serve 900 persons.
- Currently there are approximately 660 acres of undeveloped lands within the sewershed which, if developed, would translate to approximately 14,200 persons in excess of the plant's capacity. It is projected that the upgrade will facilitate an additional 17,000 people, this will be confirmed during the detailed design.
- Should development activity continue in this manner without any action by the Municipality, the plant will fall out of compliance with the current treatment regulations.
- In addition to a strong growth in the Eastern Passage sewershed (See Figure 1) in recent years, the Province is increasing the current treatment level requirements. The result is a need to upgrade the Eastern Passage Waste Water Treatment Plant as soon as possible.
- There is \$146,000 allocated in the 2004/05 budget to commence the treatment plant study and pre-design, \$776,000 has been tentatively ear-marked for the 2005/06 budget. Approximately \$18,000,000 more is required, but not yet authorized, for the construction of the upgrade.

How did we get here?

- There are *areas where storm sewers do not exist* where footing drains and *roof leaders may have been connected to the sanitary system*. Also, as collection systems age there is a higher probability for an increase in the *infiltration and inflow* of ground and other water into the sanitary systems.

- *Design standards have changed* since the plant was first brought online (dry weather flows versus average daily flows).
- Expansions to the service boundary to include additional lands.

What can be done in the interim?

- Staff need to conduct a case study on infiltration/inflow to assist in quantifying the typical levels found within HRM collection systems.
- A strengthened understanding of regional planning, service boundaries, plant capacity and appropriate development approval mechanisms, such as the Subdivision Bylaw and Municipal Planning Strategy, is required to prevent this in the future.

DISCUSSION

- HRM has an obligation to service by- right developments under the current regulations.
- The Municipality should not allow this treatment plant to go out of compliance while building two new Harbour Solutions treatment plants that will discharge to the same receiving waters.
- Staff have met internally and with the Nova Scotia Department of Environment and Labour and Environment Canada to discuss the potential growth within this sewer shed, existing and future flows to the treatment plant and HRM's responsibility to comply with level of treatment standards set forth by the regulatory agencies.
- Should flow levels at the treatment plant exceed the design capacity, staff will be able to maintain the discharge to the Harbour within acceptable health limits for bacteria through chlorination, and no significant short-term environmental effects are anticipated. The upgrades to the plant will be completed on a similar timetable as we achieve treatment with the Halifax Harbour Solutions Project. This will be necessary to prevent new problem areas from developing within the receiving waters.

Given HRM is preparing to undertake the necessary upgrades to the treatment plant and there is approximately 2 years of capacity available, staff have agreed:

- Not to recommend MPS amendments that would result in extensions to the existing Service Boundary leading to a net increase in density and sewage flows to the plant, prior to it being upgraded.
- Review any new Development Agreements and Rezoning applications within the sewer shed to determine their impact on the Eastern Passage Treatment Plant. Policy exists that will

allow Council to refuse Development Agreements and Rezoning that may have an adverse effect on the plant.

- Continue to monitor new development with respect to capacity at the Eastern Passage Treatment Plant.

Regional Planning Implications

Areas for growth as identified by the Regional Plan will indicate service shortfalls and propose extensions to the service boundary. It would not be feasible to service an alternate area of this magnitude inland because of restrictions of receiving waters. Past expenditures to build and upgrade the plant and defining the existing service boundary have identified this as a reasonable growth area. The Regional Plan has not reached a conclusion on future growth areas, but early indications show this as a practical growth area and the expansion of this plant will not be inconsistent with the Regional Plan. However, the allocation of any additional capacity gained from this expansion will not be determined until the completion of the Regional Plan.

BUDGET IMPLICATIONS

There is \$146,000 approved in the 2004/05 budget to commission the study and pre-design of the EPWWTP with \$776,000 being projected to complete the design in the 2005/06 budget.

The overall cost to complete the upgrade is dependent on the outcome of the study and design, however, it is currently estimated at \$18,000,000. The capital investments to upgrade plant capacity will require a funding commitment. Funding options and financial implications will follow as part of a future Recommendation Report for Council's consideration of approval.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

ALTERNATIVES

1. Council may direct staff to put in place amendments to the Municipal Planning Strategy and Subdivision Bylaw which would restrict growth in the Eastern Passage sewershed until the Eastern Passage Treatment Plant is upgraded. This alternative is not recommended as there may be a significant increase in applications by developers before the implementation of such amendments.

2. Council may direct staff to continue approving by- right subdivision applications without the recommended commitment to the upgrades. This alternative is not recommended as HRM is obligated to meet legislative regulatory requirements.

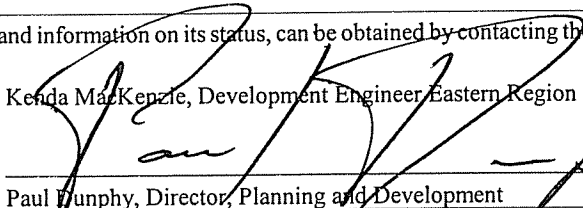
ATTACHMENTS

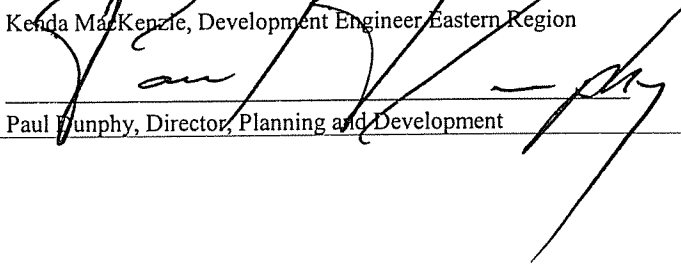
Figure 1 - Undeveloped Lands Within the Eastern Passage Service Boundary

Attachment 1 - Chronology of Upgrades and Changes to the Service Boundary for the EPWWTP

Attachment 2 - Status of the Plant Today

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by:  Kenda MacKenzie, Development Engineer, Eastern Region

Report Approved by:  Paul Murphy, Director, Planning and Development

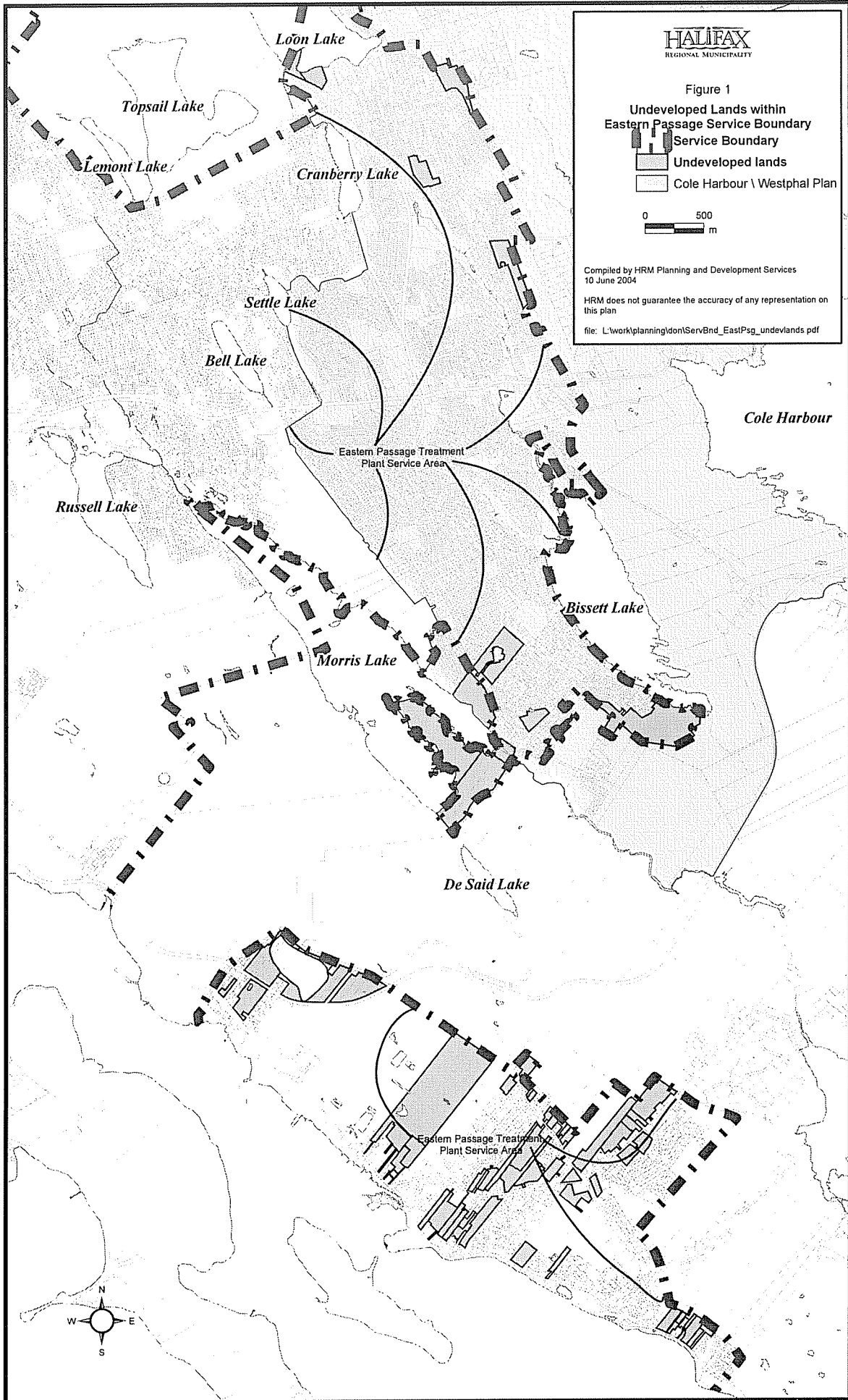




Figure 1
Undeveloped Lands within
Eastern Passage Service Boundary

-  Undeveloped lands
-  Cole Harbour \ Westphal Plan



Compiled by HRM Planning and Development Services
10 June 2004
HRM does not guarantee the accuracy of any representation on
this plan
file: L:\work\planning\don\ServBnd_EastPsg_undeveloped.pdf

Attachment 1
Chronology of Upgrades and Changes to the Service Boundary for the EPWWTP

The Eastern Passage Wastewater Treatment Plant (EPWWTP) was constructed in 1974 as a secondary treatment plant with a nominal capacity of 1.9 MIGD and was committed to serving a population of 39,000 persons (2200 acres at 18 persons per acre). In the early 1980's the average flows to the plant surpassed the nominal design capacity and was only servicing 29,500 persons. As a result of the higher hydraulic loading, the removal efficiencies set in the regional design were no longer being met.

In 1986, based on recommendations from the Westphal - Cole Harbour - Eastern Passage Pollution Control Study (Porter Dillon, June 1985), Council doubled the capacity of the Eastern Passage Sewage Treatment Plant and expanded the service boundary.

It was proposed to double the capacity of the treatment facility to 3.8 MIGD and reduce the level of treatment to primary. It was planned that the EPWWTP would be decommissioned and replaced with a pump station which would divert flows to the (then) proposed HHCI plant located on McNabs Island. It was projected that this upgrade would accommodate a population of 54,300 persons. This projection was based on treating dry weather flows only.

The gained capacity was capable of servicing an additional 570 acres of land. Staff felt that this allocation of the land should favour the Cole Harbour area, as development appeared to be occurring at a faster rate than Eastern Passage. However, Council decided to split the flows equally amongst the two areas.

Since the expansion of the boundary there have been notable amendments to the service boundary and are as follows:

1. In 1986 just prior to the adopting the expansion of the boundary, Chesnut Reality requested an extension to the original service boundary to incorporate 40 acres of their lands. These lands were to be brought into the boundary with the amendment in later in 1986. The early extension of the sanitary boundary was undertaken to coordinate construction with a local extension to the water service and reduce construction costs. There was no net increase in the boundary as it exists today.
2. In 1987, Clayton conducted flow monitoring to argue that the actual flows generated from the Colby South Development were less than the theoretical design flows allocated to their lands. The results of this exercise permitted an additional 73 acres of Clayton land holdings to be brought into the service boundary. There was a condition placed on this addition, only 50 acres were to come into the boundary initially, once the developer wished to take in the remaining 23, another flow monitoring study was to be completed. Clayton has only developed approximately half of the initial 50 acres.

3. In 1993, Oknah removed 6 acres of land holdings north east of Carlisle Drive and replaced the 6 acres with land holdings on the east side of Pearl Drive. This was done to allow for a more feasible servicing of Pearl Drive. There was no net increase in the boundary as a result of this amendment.
4. In 1997, Mounera Halo, requested removal of 15.1 acres of lands and replace them with 15.9 acres in the area of Smith Avenue. Of the 15.1 acres removed from the boundary, 13.9 acres were deeded to the Municipality as park and conservation land on Bissett Road, and the remaining lands were deeded as parkland on Smith Avenue. There is a net increase of .8 acres in the service boundary which staff felt would have a negligible affect on the overall capacity of the EPWWTP. As well, staff committed to maintain the overall generation of sewage to an equivalent of that of a 15.1 acres through controlling the overall density of development on these lands.
5. In 2000, Barwil Developments requested to remove 5 Lots from Saphire Court and relocate them on Pearl and Carlisle Drive Extension. This resulted in no net increase in the service boundary.
6. A Development Agreement for Heritage Hills was signed in 1996. These land holdings were allocated a sewage capacity equivalent of 738 dwelling units. The developer replaced one phase of the development with a middle school.

In 1997 the development agreement for Morris Lake Estates was developed. These land holdings were not intended for servicing at the EPWWTP, however, the developer of Heritage Hills, Anahid, transferred capacity from the Heritage Hills lands to the Morris Lake Estates lands. The new agreement would permit 618 dwelling units to be developed in Heritage Hills and 129 dwelling units within Morris Lake Estates.

The developer has recently applied for an amendment which will increase the density on the remaining streets, however, due to the construction of a school in this development, the overall number of lots will remain within those set in the Development Agreement. Staff recently received the required flow monitoring report and is reviewing the outcome of the flow monitoring before making comment on this application.

From the original agreement there was no net increase in the theoretical sewage generation within the service boundary. The flow monitoring should provide confirmation on the actual generation for the Heritage Hills development.

7. Some subdivisions such as Forest Hills were built without storm sewers, so roof drains and other collection elements were tied directly into the sanitary sewers, making Inflow and Infiltration (I&I) remediation very difficult. EMS is undertaking I&I reduction measures in various locations throughout the municipality, but this activity is not seen as a mechanism to free up capacity to support increased development in an area, but to improve the functionality of a conveyance system.

8. The lands of the Mill Brook First Nations adjacent to Morris Lake, approximately 20 acres, were not included in the original service boundary nor officially in the expanded boundary. However, there was an agreement made with the Mill Brook First Nations Band to allow them to connect to the services, should they choose to do so, in exchange for the ability of HRM to use a portion of their lands to install HRM infrastructure unrelated to the Mill Brook lands. Development to date on these lands has not been significant enough to be of concern. HRM permits and zoning are not applicable to these lands making it difficult to project the developed flows and population.

In conclusion, after the initial expansion to service boundary, there appears to be an increase of 74 acres to the service boundary which is equivalent to a population of 1330 persons or a flow of 660 m³/day Average Daily Flow (ADF). However, presently, only 51 acres is capable of being serviced on a by-right basis, which would be equivalent to 915 people and a flow of 450 m³/day (ADF).

Attachment 2 Status of the Plant Today

A recently completed study by Dillon (September 2003), indicated that the Eastern Passage Wastewater Treatment Plant is nearing capacity for treating the average daily flows from the existing service boundary. It appears that there is enough capacity left to service a population of approximately 885 persons.

The study indicated that the wet weather flows experienced at the treatment plant far exceed the design capacity of the plant. Past practice was to design plants to treat dry-weather or average flows, which resulted in under-treatment or bypass of wet weather flows. This approach is not acceptable today and so a more comprehensive approach to the issue is required.

Infiltration/inflow into the collection system of the EPWWTP is high, primarily as a result of past construction practices. For example, some subdivisions were built without storm sewers, so that roof drains and sump pumps and other collection elements are often tied directly into the sanitary sewers, making Inflow/Infiltration (I/I) reduction very difficult to identify and very costly to implement, both for the Municipality and for the private property owner.

EMS has been undertaking I/I reduction in various locations within the sewershed over the last several years, and some other work is planned. To date, this work has focussed on the capacity and functionality of the collection system (i.e. pumping stations and sewers) but not for the sewershed as a whole, and not for the purpose of providing growth on a large-scale basis.

A pre-design study for the Eastern Passage Wastewater Treatment Plant was approved in the 2004/05 capital budget, which will in turn lead to the design and construction of the plant expansion. This study will address the issue of flows to the plant as related to design capacity and future population to be serviced by the plant. The consultant will be required to investigate wet weather flows in the sewershed, and to identify and develop options to manage these wet weather flows in the context of the expansion of the plant, complete with capital and operating costs and phasing. Some obvious management options are infiltration/inflow reduction, storage and disinfection. The consultant is to identify any other options which may be available.

The wet weather flow management options will be reviewed with the appropriate regulatory authorities to determine the preferred approach. From this process the design population of the treatment plant will be determined.

With respect to immediate growth within the sewershed, staff is currently reviewing applications that could potentially service 900 persons over the next 2 years, based on recent development trends. As well, EMS is contemplating redirecting the flows going to the Belmont Treatment plant to the EPWWTP and decommissioning the Belmont Plant. This would constitute an expansion to the service boundary. This will be considered and a decision will be made as part of the pre-design process this year.