THE CORPORATION OF THE CITY OF PORT COQUITLAM

ENVIRONMENTAL PROTECTION COMMITTEE

Wednesday, September 28, 1994

Meeting Room No. 2
2580 Shaughnessy Street, Port Coquitlam, BC

5:00 p.m.

AGENDA

PERSONNEL IN ATTENDANCE:

CONFIRMATION OF MINUTES OF PREVIOUS MEETING

ITEM I: LEGACY BLUE LABEL DRAIN LINE MANAGEMENT PROGRAM

ITEM II: DRAFT DOWNTOWN PARKING STUDY - COMMENTS FOR CONSIDERATION

ITEM III: 1995/96 PROPOSED ENVIRONMENTAL BUDGET

ITEM IV: NORTH ISLAND ROUND TABLE BHP LANDFILL PROPOSAL
Supporting Documentation - Volume II Additional Studies
Out-of-Region Disposal (For Information Only)

ITEM V: 1993/94 ANNUAL REPORT - COMMISSION ON RESOURCES AND ENVIRONMENT

ITEM VI: B.C. HYDRO REPORT - AUGUST 1994
(For information only)

ITEM VII: OTHER BUSINESS

SEP 2 8 1994

THE CORPORATION OF THE CITY OF PORT COQUITLAM

ENVIRONMENTAL PROTECTION COMMITTEE

MINUTES

A meeting of the Environmental Protection Committee was held at City Hall, 2580 Shaughnessy Street, Port Coquitlam, on Wednesday, September 28, 1994 at 5:00 p.m. in Meeting Room #2.

In attendance were:

Councillor M. Gates, Chair
F. Cheung, Project Engineer
C. Deakin, Engineering Secretary

The minutes for the September 7, 1994 Committee meeting were considered, read and adopted.
Carried

ITEM I: LEGACY BLUE LABEL DRAIN LINE MANAGEMENT PROGRAM

The Committee agreed with staff recommendations to clean grease traps and intervals sufficiently request to ensure their proper functioning and use of drip enzyme, chemical treatment or any other treatment in a grease trap with the objective of causing fat, oil or grease to flow through the interceptor and into sanitary sewers should be named and made illegal. Committee would also like to have time frame set for maximum time allowable between checks. Project Engineer to get back to Committee with agreeable time limit.

ITEM II: DOWNTOWN PARKING STUDY

Committee asked that Development Cost Charges be considered for parking. Councillor Gates also asked that the City consider charging half the fees for service groups like the Legion, Elks Hall etc. since most of their money raised is given back to community. The above two recommendations shall be added to the original list.

ITEM III: 1995/96 PROPOSED ENVIRONMENTAL BUDGET

For information.

ITEM IV: NORTH ISLAND ROUND TABLE BHP LANDFILL PROPOSAL

For information.

ITEM V: 1993/94 ANNUAL REPORT - COMMISSION ON RESOURCES AND ENVIRONMENT

For information.

ITEM VI: B.C. HYDRO REPORT

For information.

ITEM VII: OTHER BUSINESS

a) B.C. Youth Soccer - Donation

Committee approved donation of $120 towards a green advertisement in their souvenir program for the Mini-Soccer Festival.

Environmental Protection Committee Meeting of September 28, 1994 Cont'd ...

b) PLA Application for Environment Areas

Councillor Gates asked that the Project Engineer check into application requirements for environmentally zoned areas. Would like to know if the application is removed will the environment be affected? How?.

There being no further business the meeting adjourned at 5:40 p.m.

F. Cheung, P. Eng.
Project Engineer

Councillor M. Gates
Committee Chairman

JEY/cd

NOTE Minutes not read and adopted by the Committee until certified correct by the Chairman's signature.

cc: Mayor and Councillors
City Administrator
City Engineer
Project Engineer
Project Technician

SEP 28 1994

THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Environmental Protection Committee — DATE: September 09, 1994

FROM: F. K. K. Cheung, P. Eng.
Project Engineer — FILE No: EPC

SUBJECT: **LEGACY BLUE LABEL DRAIN LINE MANAGEMENT PROGRAM**

RECOMMENDATION:

1. That Committee receive this memorandum for information only.

2. That Committee consider reviewing the current City Bylaw No. 830 Section 18 that:

   i. Grease traps shall be cleaned at intervals sufficiently frequent to ensure their proper functioning and certified from an approved vendor that it carried out the cleaning service.
   ii. Use of drip enzyme, chemical treatment or any other treatment in a grease trap with the objective of causing fat, oil or grease to flow through the interceptor and into sanitary sewers should be named and made illegal.

BACKGROUND & COMMENTS:

The attached letter and report from Clemco Industries Inc. was referred to the Environmental Protection Committee from Mayor L. Traboulay. The report documents the evaluation of the Legacy Blue Label drain line management program compared to traditional pumping system which grease, from a food services establishment, is pumped from a grease trap and transport it off-site to municipal treatment facilities. The Legacy is a program that uses biotechnology to reduce waste to create environmentally-friendly byproducts (carbon dioxide and water).

Essentially, the report concluded that the Legacy program is a superior system (environmentally and economically) than the traditional pumping system. The report also outlined several recommendations which the City can review and may consider incorporating into the existing City Bylaw No. 830, namely:

1. Grease traps shall be cleaned and certified from an approved vendor that it carried out the cleaning service.
2. Use of drip enzyme, chemical treatment or any other treatment in a grease trap with the objective of causing fat, oil or grease to flow through the grease trap and into sanitary sewers should be named and made illegal.

These two recommendations are worth considering since the City do not monitor or regulate the frequecy or adequacy of grease traps cleaning of food services establishments. The grease in the grease trap, if not regularly cleaned, will create a blockage problem in the food services establishment's own sanitary sewer line as well as the City's sanitary sewer. In addition, the use of drip enzyme, chemical treatment or any other treatment in a grease trap, which permits fat, oil or grease to flow through the grease trap, could also create blockage problem in the City's sanitary sewers.

F. K. K. Cheung, P. Eng.
Project Engineer

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STORAGE AND HANDLING OF UTENSILS, ETC:

17. (a) All utensils and equipment after cleaning and bactericidal treatment, a single service items, linens and cloths, shall be stored in a clean, dry a sanitary place protected from files, dust, splash, or other contamination, and shall be handled at all times so as to prevent contamination by contact with dusty surfaces, fingers, used foods or waste material of any kind.

(b) Utensils such as spoons, spatulas, dippers, or scoops used for dispensing frozen desserts, shall be kept clean and sanitary.

WASTE DISPOSAL:

18. (a) All waste materials shall be disposed of properly. All plumbing shall be designed, installed and maintained so as to prevent contamination of water supply, food, drink or equipment.

(b) In and about every food establishment there shall be provided and maintained in a suitable location on the property a sufficient number of garbage cans, equipped with tight fitting lids to prevent access of flies and vermin, and they shall be washed at intervals sufficiently frequent to maintain them in a sanitary condition.

(c) All plumbing, drainage and sewerage facilities shall be constructed and maintained in accordance with Bylaws of The Corporation of the City of Por Coquitlam.

(d) Waste water from refrigeration equipment shall discharge into an open si or drain properly trapped and sewer connected; provided, however, that where sewer connections are not available, clean and adequate water tight drip plans may be used.

(e) Grease traps shall be cleaned at intervals sufficiently frequent to ensure their proper functioning.

REFRIGERATION:

19. (a) Adequate refrigeration shall be provided for all perishable foods.

(b) All refrigerators shall be maintained in a sanitary condition and free from musty, putrescent or other disagreeable odours. No meat shall be stored in direct contact with shelves or walls.

(c) All perishable foods or beverages shall be kept at or below 50 degrees Fahrenheit except when in the opinion of the Medical Health Officer lower temperatures are required.

(d) Frozen food storage shall be provided in accordance with the requirements of the Regulations governing frozen food lockers of the Province of British Columbia.

(e) Accurate thermometers shall be provided in every refrigerator unit.

Clemco Industries Inc.
110 - 4471 No.6 Rd., Richmond, BC., V6V 1P8, Tel (604) 244-1116, Fax (604) 244-1117

August 19, 1994

Honorable M. Traboulay
The Corporation of the City of PORT COQUITLAM
2580 Shaugnessy Street
Port Coquitlam, B.C.
V3C 2A8

Dear Honorable M. Traboulay:

Each day Vancouverites consume *a billion* litres of water. That's more than any other major city in Canada. There needs to be a concerted effort by government and industry to conserve and protect our resources. If not, municipal and industry experts predict we will need to secure new water sources by the year 2005.

Government, industry and residents must work together to remove harmful contaminants from municipal waterways. Grease is one of the most costly contaminants to remove from municipal treatment equipment and sewer system backups.

In the Lower Mainland, more than 5,000 food service establishments dispose of thousands of litres of grease into waste interceptors and transport it off-site to municipal treatment facilities. The process is often noisy, unsanitary and does not break down the grease into natural elements. At Clemco Industries Inc., we believed that waste could be treated at the source and reduced into natural elements.

For the past seven months, we have conducted an **independent study** to test the **LEGACY™ Blue Label Drain Line Management Program** in a large multi-national chain restaurant. The program uses **biotechnology to reduce waste** to create environmentally-friendly byproducts (carbon dioxide and water). The results prove the **LEGACY™** program to be an effective waste management tool for the food service industry.

We have included our **preliminary results, trial design** and **program information.** We have also included information about what governments are recommending to meet the challenges of waste management in the future.

LEGACY™

For a more comprehensive copy of the trial or more information about the program, please call, fax or write to:

Mr. Ken Rattray

Director - Marketing and Sales

Clemco Industries Inc.

Unit #110 - 4471 No. 6 Road

Richmond, B.C.

V6V 1P8

(604)244-1116 or (604)244-1117 (fax.)

We believe that the **LEGACY™** program provides a strong environmentally-friendly alternative to traditional pumping or grease treatments.

Yours very truly,

Ken Rattray

Director - Marketing and Sales

Enclosures

Government and Industry Working To Protect Our Future...

- Today, the Greater Vancouver District (GVRD) has recognized the need to protect and conserve its water supply. The GVRD's **1.7 million residents, as well as businesses are consuming a billion litres** of water a day. Experts predict that **new sources will be needed by the year 2005**, if the demand continues. **(Source: Vancouver Sun, July 17, 1994).**

- The need to conserve and protect the water supply extends beyond Vancouver. Canadian residential water use is two to three times more than some European countries. Estimates suggest that by the year 2001 **water use** in all Canadian municipalities will **double. (Source: Municipal Water Issues in Canada, S. Meakin, c 1993).**

- Municipalities will need to adopt **new approaches** to waste management. New treatments and technologies will need to be investigated from **biological processing** to reducing waste on-site. S. Meakin suggests that biological processing is the most efficient way of removing organic matter from municipal waste waters.

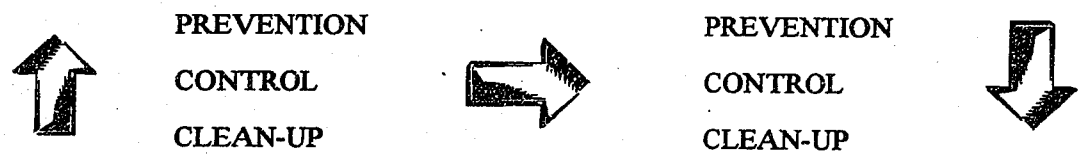
- The federal government is concerned about the future of our water supply. The Canadian environment ministers have set a **national goal to reduce waste by 50 per cent** by the year 2000. It also encourages governments to **promote the development and demonstration of water-saving and non-polluting technologies.**

- The Canadian Council of Ministers of the Environment (CCME) has acknowledged that **pollutant prevention** is a more effective way to control waste than treatment or cleanup.

- There is a need for governments to anticipate and prevent pollution. In the 90's, governments must have an effective program of **pollution management**. They must **prevent, control and clean-up** waste to protect the environment and work towards sustainable development.

- The CCME is asking governments to **provide leadership** and support for pollution prevention initiatives by developing public policy and implementing programs.

- The CCME has developed a framework to represent their new direction (see below).



REACTIVE APPROACH
(Traditional Focus)

PRO-ACTIVE APPROACH
(New Direction)

- A responsible **pro-active** approach to pollution management according to the CCME will:

  - **minimize** or avoid the creation of pollutants;
  - **avoid** the transfer of pollutants from one medium to another (i.e. pumping and other waste management techniques transport waste from one location to another);
  - **accelerate waste reduction or eliminate pollutants;**
  - **minimize health risks;**
  - **promote** the development of source reduction technologies;
  - **use energy, materials and resources more efficiently;**
  - **minimize costs** for environmental enforcement;
  - **limit future liability;**
  - **avoid** costly clean-ups;
  - **promote** a more competitive economy.

- Other recommendations to jurisdictions include:
  - **reducing and eliminating** the use of toxic chemicals;
  - introducing the **concept** of treating waste **"at the source"** or at "the earliest stages of design". This includes any concepts, plans, policies, products, projects and processes.

- Pollution prevention should be a **continuous process** incorporating opportunities for improvement such as new **scientific and technological developments.**

- The CCME also encourages governments to **recognize and promote** successful pollution prevention initiatives.

- The CCME is encouraging governments to **form partnerships** to achieve pollution prevention goals.

- In 1990, the federal government introduced a **Framework for Discussion on the Environment.** Its mandate was to make Canada the world's most environmentally-friendly country by the year 2000. The document asked governments to support innovative science and technology.

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Biotechnology
Fact Sheet

- In Canada, biotech companies are growing rapidly by offering innovative products and services to industries. They are making significant investments in research and technology to provide products and services to industries such as food and beverage, cosmetics, forestry and mining. These industries are using biotechnology to gain a competitive advantage. Applications include cloning varieties of plants, processes in mining of uranium and gold, blood alcohol tests and waste management systems. **(Source: Canadian Biotech '89)**

- In 1993, the Canadian Biotechnology 1993 directory provided a regional breakdown of biotech companies by province.

Province	Per Cent
British Columbia	**17**
Alberta	**6**
Manitoba	**2**
Saskatchewan	**3**
Ontario	**34**
Quebec	**29**
New Brunswick	**3**
Nova Scotia	**3**
Newfoundland	**>1**
PEI	**1**
Total	**100**

(Source: Canadian Biotechnology 1993 Contact International Inc.)

- Industrial applications of biotechnology were first introduced into Canada in 1982. By 1989, 10,600 products of biotechnology had been developed, distributed and marketed across Canada. More than 200 biotechnology companies were participating in an international industry valued at $6 billion. Industry experts predict by the year 2000, sales of biotechnology will be over $100 billion. **(Source: Canadian Biotech '89: On The Threshold)**

- This chart represents the six major industries applying the latest biotechnology.

Industry	Per Cent
Health Care	38
Environment	16
Agriculture	14
Food & Beverage	9
Aquaculture	5
Forestry	5
Other industries	13
TOTAL	100

(Source: Canadian Biotechnology 1993 Contact International Inc.)

- Canada has gained a reputation as a leading supplier of biological products such as hardy winter wheat and pediatric vaccines. (Source: Canadian Biotech '89: On The Threshold)

- In 1989, a survey revealed that product sales per employee were higher in Canada than in the United States although research and development costs were similar. More Canadian companies were established before their American counterparts. American companies were more likely to invest in manufacturing facilities than Canadian companies (as much as eight times more). And, Canadian companies had a greater dependence on export sales than American companies.

(Information collected from a survey collected in a collaborative project of Ernst & Young High Technology Group, Winter House Scientific Publications, Industry, Science and Technology Canada and the National Research Council)

- Biotechnology has played a role for thousands of years. Ancient civilizations harnessed wild yeast to make fermented drinks and leavened bread. Each generation applied and adapted the technology to tasks of the day. Today, scientists create domestic breeds of bacteria to manufacture biological products that perform very specific chemical reactions. (Source: Canadian Biotech '89: On The Threshold)

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For more information, please contact: **Judy McOstrich**
Splash Marketing Communications
(604)940-1657

News Release

FOR IMMEDIATE RELEASE

Innovative, young company introduces biotech products and service solutions to the food service industry

August 12, 1994 — (RICHMOND, BC) — More than 5,000 food service establishments in the Lower Mainland will find "cutting the fat" easier with the introduction of the LEGACY™ program. Clemco Industries Inc., a dynamic Richmond-based biotech company, has introduced a program to help food service operators protect the environment and manage waste.

Traditionally, food service establishments have stored fat, oil and grease in waste interceptors (grease traps located underneath or outside food service establishments). When they become full, the interceptors are pumped and the waste is delivered to municipal treatment facilities. For most food service operators, pumping is expensive and disruptive to both their customers and staff.

Clemco's LEGACY™ program employs the advances in biotechnology to convert waste build-up. The technology converts the waste into carbon dioxide, water and sediment reducing the establishment's transportable waste (by approximately 85 per cent.) The result is carbon dioxide and water byproducts which blend naturally into municipal waterways. The efficient management system effectively keeps waste within municipally legislated guidelines.

The program was first introduced into the Vancouver market in January 1994. Within the past six months, more than 200 food service establishments have installed the system. "We have received an enthusiastic response from restaurants in the Lower Mainland. We attribute our success to a program that combines excellent service with substantial cost savings for our customers," says William A. Zemlak, president, Clemco Industries Inc.

Clemco customizes the product and service it offers to meet each customer's needs. Bacterial strains are selected to create a product designed to meet the needs of each waste site. Trained professionals visit regularly to conduct extensive tests, prepare detailed reports and answer customer questions immediately. The program also provides a 24-hour emergency service to respond to customer needs' and to clear backups.

Companies who are committed to protecting the environment and remaining within municipal guidelines have recognized the value of the program. They appreciate the service and savings they have received since implementing the program.

"Food service operators are recognizing the importance of our program. The company's aggressive pursuit of new business and marketing has been responsible for a 200 per cent increase in sales (over the last two quarters). I anticipate that the program will be installed in over 500 food service establishments in the Lower Mainland by the end of 1994," says Mr. Zemlak.

Clemco is poised for rapid growth with a network of trained technicians and customer service professionals armed with the latest technology. The company has a history of providing environmentally-friendly products and services to the food service industry. Its product line-up includes waste management systems, as well as natural solvents, degreasers, and deodorizers. In 1993, the company received assistance from IRAP (a division of the National Research Council) to develop additional environmentally-friendly products.

Clemco Industries Inc. is one of North America's leading biotech companies committed to providing products and services to protect the environment.

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For more information, please contact: **Judy McOstrich**
Splash Marketing Communications
(604)940-1657

LEGACY™

Blue Label Drain Line Management Program

Grease generated by commercial food preparation can cause significant problems and expense for municipalities when it enters the drainage system, or is transported for treatment at GVRD facilities.

Clemco Industries Inc., has developed a waste management system that:

- **eliminates or reduces** the grease entering the sewer system;
- **reduces the maintenance** required to remove grease from sewer liners;
- **reduces** the chance of **major grease blockages;**
- significantly **reduces waste** that needs to be transported for treatment;
- helps to **protect** the water supply;
- **will save municipalities money;**
- **can save the food service industry money;**
- and, **treats waste at the source.**

Clemco Industries Inc.

Corporate Office: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 1117

Vancouver Branch: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 1117

LEGACY *Blue Label* Drain Line Management Program

The LEGACY ***Blue Label*** drain line management program. A complete, on-site waste interceptor and drain line management service performed by our highly trained LEGACY Service Representatives.

Including:

- 24 Hour emergency service for blocked drain lines;
- regularly scheduled maintenance calls to treat your waste on site using our unique bioremediation process;
- drainage system design consultation;
- assessment of the status and compliance of your waste interceptor;
- assistance with regulatory authorities on your drain line problems;
- advice on drain line techniques to avoid costly backups;
- extensive documentation to help you manage your facility at its optimum efficiency;
- available complementary range of neutral pH cleaners, degreasers, sanitizers and deordorizers.

The Future is Here Today!

The LEGACY ***Blue Label*** program with our proprietary bioremediation service is the future for handling waste in the food service industry's drain line system. It:

- saves money;
- treats your effluent on site;
- eliminates or greatly reduces the need for pumping;
- avoids drain line backups;
- avoids municpal fines;
- reduces or eliminates odors from your drain lines and waste interceptor;
- reduces the use of hazardous acid or caustic drain cleaners to protect you and your staff;
- reduces plumbing costs;
- eliminates costly, toxic and ineffective chemical treatment (ie. enzymes, solvents, etc.);
- eliminates the need for you or your staff to deal with your drain lines or waste interceptor.

Who Uses LEGACY *Blue Label* Service?

LEGACY services over one hundred customers in the lower mainland. Many are multiple site companies, or have more than one waste interceptor on each site. Our customers range from small grease traps that were pumped at up to six months intervals, to high volume operations that were formerly pumping up to twice monthly. The following types of organizations are typical users:

- Fast food restaurants
- Hotels
- Supermarkets
- Full service restaurants
- Government cafeterias
- Schools
- Golf courses
- Pubs and bars

"Products and services to preserve our natural resources"

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Document number: DC00011	Date issued: August 12, 1994	Replaces date: May 6, 1994	Not valid after: N/A

Why Avoid Pumping and Drip Enzymes?

The food service industry is required by law to maintain waste interceptors (often called grease traps) to prevent cooking fats, oils and grease from entering the municipal sewer system and to maintain certain effluent standards. Waste interceptors were traditionally pumped (as frequently as every two weeks), and the resulting waste trucked to a specific municipal sewage treatment plant for disposal. The problems with pumping are:

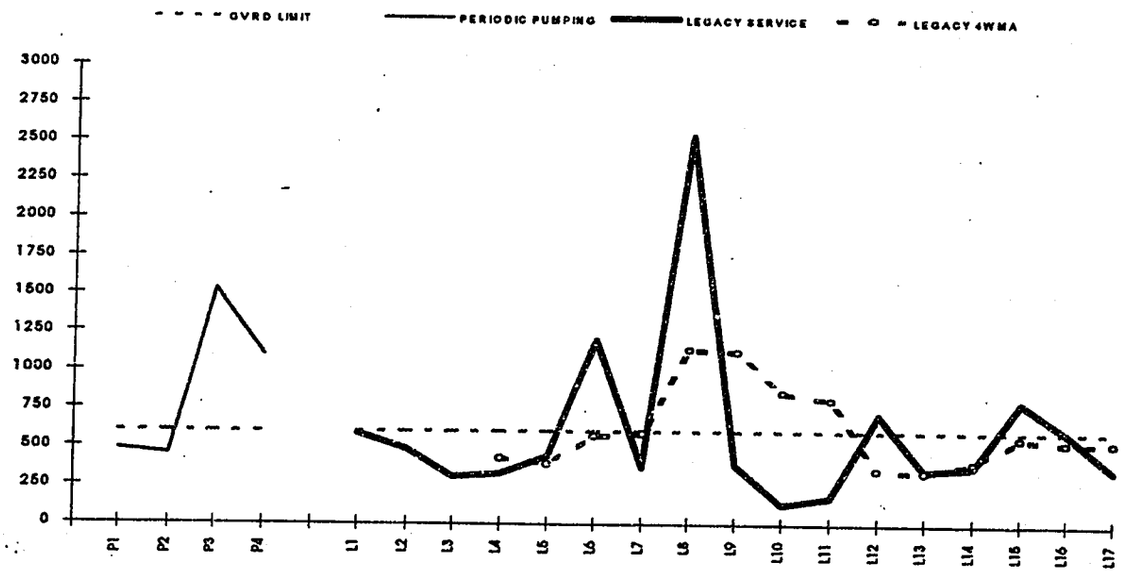
- it is expensive;
- it is noisy, smelly and disruptive to both staff and customers;
- it only removes waste periodically, and the trap rapidly fills again;
- it doesnot maintain continued compliance with municipal effluent guidelines;
- restaurant grease is the largest problem in municipal sewage plants because it reduces the efficiency of the bacteria in the plant's digesters (a long time use of bioremediation) and clogs machinery.

Drip enzyme treatment is an unacceptable alternative to pumping. Drip programs introduce only enough enzymes to the interceptor to break up the grease but not fully metabolize it. Such programs are discouraged by municipal authorities, who realize that the dispersed grease will recombine to block the municipal system. Drip enzyme programs are currently under consideration for bylaw restriction in a number of United States and Canadian jursidictions. Other unacceptable methods which only send the grease problem farther down the municipal line include hot water flushing and solvents to dissolve the grease.

Proven in the Field!

Through extensive testing using an independent laboratory, an international fast food chain and the active involvement of local municipal authorities, we have documented and proven that the LEGACY ***Blue Label*** program outperforms all other systems currently used to handle food service effluent.

The following is a graph of actual Total Oil and Grease (TOG) results of the LEGACY ***Blue Label*** drain line management program as compared to pumping the same trap monthly. The test site was an international fast food restaurant in Vancouver **where the waste interceptor was formerly pumped every two weeks**, and the results were obtained by an independent laboratory under the monitoring and protocol approval of the City of Vancouver. **Even after sixteen weeks on the LEGACY *Blue Label* program, no pumping was required or planned!**



Be Part of the Solution!!!

Clemco Industries Inc.

Field Test Results
LEGACY™ *Blue Label* Drain Line Management Program

Final Report Prepared July 1994

Contact:

William A. Zemlak
Clemco Industries Inc.
Unit 110 - 4471 No. 6 Road
Richmond, BC
V6V 1P8
Telephone: 604 244 1116
FAX: 604 244 1117

Foreword

Clemco Industries Inc. acknowledges the strong cooperation of McDonald's Restaurants of Canada Limited and the Environmental Protection Branch, Permits and Licenses Department of the City of Vancouver in conducting this test.

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Appendices

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I. Executive Summary

The food service industry is required by law to maintain certain effluent standards. The standards in the Greater Vancouver Regional District (GVRD) are set out in the Sewer Use Bylaw No. 164 (Bylaw 164). Waste interceptors (often called grease traps) are the most common method used to prevent cooking fats, oils and grease from entering the municipal sewer system. Waste interceptors are traditionally pumped and the resulting waste trucked to a specific municipal sewage treatment plant for disposal. The negative aspects of pumping are:

- it is expensive;
- it is noisy, smelly and disruptive to both staff and customers;
- it only removes waste periodically, and the trap rapidly fills again;
- it does not maintain continued compliance with municipal effluent guidelines;
- it only bypasses the sewer lines periodically and still moves the waste, without treatment, to a down line treatment facility;
- restaurant grease is the largest problem in municipal sewage plants because it reduces the efficiency of the plant's digesters and clogs machinery.

Other unacceptable methods which only send the grease problem farther down the municipal line include drip enzyme treatments, hot water flushing and solvents to dissolve the grease.

Clemco Industries Inc. (Clemco) developed the LEGACY™ ***Blue Label*** drain line management program as the economical environmentally superior alternative. McDonald's Restaurants of Canada Limited was the impetus for Clemco's efforts with their ongoing programs to reduce restaurant waste on site. McDonald's and the City of Vancouver, with the encouragement of the Greater Vancouver Regional District, requested that Clemco undertake a monitored field trial to demonstrate the effectiveness of the LEGACY™ program. Clemco agreed to conduct a trial at a McDonald's restaurant. This trial would be monitored by the City of Vancouver.

A great many of the guiding principles of Clemco's business are summarized in a document entitled A National Commitment to Pollution Prevention by the Canadian Council of Ministers of the Environment. These principles broadly provide for a cooperative relationship between industry and government, encouraging voluntary experimentation and implementation first and regulation in a supporting secondary role.

The LEGACY™ ***Blue Label*** drain line management program is a complete, on-site waste interceptor and non-sanitary drain line management service performed by Clemco's highly trained Service Representatives. It includes:

- 24 hour emergency service for blocked drain lines;
- regularly scheduled maintenance calls to treat the waste on site using Clemco's proprietary bioremediation process;
- hydrajet cleaning of all drain lines;
- available pumping service to remove accumulated sediment;
- drainage system design consultation;
- assessment of the status and compliance of the waste interceptor;
- assistance with regulatory authorities on drain line problems;
- advice on drain line techniques to avoid costly backups;
- extensive documentation on services performed for management and regulatory purposes;
- available complementary range of neutral pH cleaners, degreasers, sanitizers and deodorizers.

Monthly service charges range from as low as $18.50 to $65.00 per interceptor depending on services, the number of interceptors on the site and the payment plan selected by the customer. There are approximately two hundred sites in the lower mainland currently using the LEGACY™ ***Blue Label*** drain line management program.

The purpose of the test was to evaluate the LEGACY™ ***Blue Label*** drain line management program compared to traditional pumping in a field trial, and to provide recommendations to municipal authorities for increasing effluent compliance. A protocol was developed and approved by McDonald's, the City of Vancouver, Bio-Research Laboratories Inc. and CanTest Ltd.

The test was conducted on the waste interceptor at the McDonald's restaurant at Terminal Avenue and Main Street in Vancouver between February 1 and June 28, 1994. This restaurant is reportedly one of the largest volume McDonald's in western Canada and the interceptor was formerly pumped two times per month at a cost of approximately $179.00 per month.

A graph of the results of each test parameter (except chemical oxygen demand), as there is no specified Bylaw 164 limit) was developed. The results, based on the grab sample limits in the test protocol, indicate:

- total oil and grease in the effluent was reduced to below Bylaw 164 limit;
- total suspended solids always remained below Bylaw 164 limit;
- pH was slightly below limit;
- biochemical oxygen demand (BOD) was below the 4000 mg/L Bylaw 164 limit that is applicable to the test site, but above the 2000 mg/L limit

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currently in effect for establishments constructed after 1990 and applicable to all sites on January 1, 1996

- as of final report date, the interceptor had been on the LEGACY™ ***Blue Label*** drain line management program for eighteen weeks, and no pumping had been carried out or was planned.

In addition to the specific results of this test, Clemco noted a number of other relevant factors based on its diversified field experience.

The following conclusions were drawn:

1. Bioremediation **as part of a proper maintenance program** will keep a food service establishment in compliance with Bylaw 164 total oil and grease effluent limits on a sustained basis. The effectiveness of the bioremediation is clearly evident from the test, as the interceptor was not cleaned and the effluent remained in compliance throughout the test.

2. The LEGACY™ ***Blue Label*** drain line management programs saves money each month on a direct basis for an establishment that currently uses or requires monthly pumping of its interceptor. Additional saving occur on an indirect basis through the reduction of emergency blockages.

3. There are opportunities to modify the micro-organism mix to address a reduction of the BOD levels measured in this test. Clemco is already researching appropriate formulations under its continuing development program.

4. Just pumping the interceptor even on a monthly basis will not keep the food service establishment in compliance with Bylaw 164 effluent limits on a sustained basis.

5. Interceptor pumping can be reduced from twelve times per year to one time per year with a drain line management and bioremediation program. This will result in a substantial reduction in the restaurant grease delivered to Iona Island if applied across the GVRD and assuming that the effluent in the test is representative.

6. Current interceptor technology is adequate to meet or approach Bylaw 164 effluent guidelines if the establishment is diligent in its management of its influent and effluent.

7. Most food service establishments do not have a regular maintenance program on their interceptor or any other type of voluntary program to monitor and reduce their effluent. Reaction to blockage and overflow is a common service approach, rather than preventative maintenance.

8. Drip enzyme treatment and other methods of flushing fat, oil and grease through the interceptor negate the reason for the interceptor in the first place. The result is equivalent to a pipe connecting the establishment's sink directly to the municipal line.

9. With a bioremediation component, it is possible to regulate food service establishments into reducing their effluents while reducing their costs at the same time. A mandate can be implemented that is actually beneficial to the establishment from a financial perspective. Other indirect benefits such as reduced emergency blockages will also be obtained, and the municipality will have a reduction in the number of grease blockages in its own lines as well as a reduction of effluent at its treatment facilities.

The following recommendations are made:

1. The use of drip enzyme and chemical treatments in an interceptor, or any other treatment with the objective of causing fat, oil or grease to flow through the interceptor should be named and made illegal under Bylaw 164. Fines for a lack of treatment and maintenance should be severe, should increment with each occurrence and should be levied immediately on site.

2. Food service establishments should be subject to a bylaw requirement that they service their interceptor every month. The bylaw should initially apply to those establishments that have in excess of twenty seats (or equivalent measure for takeout operations without seating). The bylaw could be structured as follows:

- based on a "Waste Reduction Incentive" of $300.00 per year, to be assessed on the annual renewal of the establishment's business license.

  In lieu of paying the Waste Reduction Incentive, the establishment could provide a certificate from an approved vendor certifying that it carried out monthly service on its interceptor;

- service defined narrowly as pumping the interceptor or maintaining a bioremediation program. This definition could be expanded through industry consultation to encompass other acceptable programs or new technologies;

- service performed by private sector vendors approved by the GVRD to carry out the work. The establishment could select any approved vendor;

- monthly interceptor service would include:

  - interceptor service and written rating stored on site;

- notation of any interceptor deficiencies from a recommended configuration developed by the municipality;
- possible extension to other problem areas, including compactor, rendering bin and dumpster maintenance.

This type of program would cost little to administer at the municipal level, as all business license documentation is already generated and mailed. It would save money for the municipality on site as the Environmental Officer or the Health Inspector would not have to open the interceptor, but would only have to inspect the Service Record. The requirement would not cost anything for establishments that were legitimately maintaining their interceptor, as they would be provided with a Waste Reduction Incentive certificate by their vendor. Indirect benefits would include less pollution from pumping trucks driving around the lower mainland.

3. The tipping fee for restaurant grease at the Iona Island treatment plant should be significantly increased. The tipping fee should be consistent with the Canadian Council of Ministers of the Environment principle that, "There should be an ongoing effort to ensure that prices better reflect the full costs of pollution, in order to understand the real benefits of prevention." Tipping fee increases of ten to fifteen times for restaurant grease would not be unreasonable given the availability and cost savings of bioremediation based programs.

This preserves the option of pumping and trucking for those establishments that elect this method. However, they should have an economic disincentive to transfer their waste given that on site treatment is now technically and economically viable.

4. Municipal governments should encourage waste generators to experiment in the open, and be prepared to tolerate continuing non-compliance where an organization has voluntarily identified a problem and is experimenting to develop a solution. Enforcement efforts should not be based on whether an establishment meets the current Bylaw 164 guidelines on a single grab or composite sample, but rather on whether that establishment has a program in place to continuously improve its current situation. Enforcement should be vigorous on those establishments that do not meet effluent guidelines and do not demonstrate any desire to improve.

II. Test Report

A. Background

The food service industry is required by law to maintain certain effluent standards. The standards in the Greater Vancouver Regional District (GVRD) are set out in the Sewer Use Bylaw No. 164 (Bylaw 164), excerpts of which are provided in Appendix A. Waste interceptors (often called grease traps) are the most common method used to prevent cooking fats, oils and grease from entering the municipal sewer system. A waste interceptor is a metal or concrete pool ranging in size from twenty to several thousand liters. It has a waste inflow pipe, baffles to slow the flow through the interceptor to allow the grease to float on top of the water and the solids to sink, and an outflow for liquid to pass to the municipal sewer system. It is typically located either under the main sinks in the restaurant or outside. The lines flowing into an interceptor handle only food waste and are separate from the sanitary system. Waste interceptors are traditionally pumped (as frequently as every two weeks), and the resulting waste trucked to a specific municipal sewage treatment plant for disposal. The negative aspects of pumping are:

- it is expensive;
- it is noisy, smelly and disruptive to both staff and customers;
- it only removes waste periodically, and the trap rapidly fills again;
- it does not maintain continued compliance with municipal effluent guidelines;
- it only bypasses the sewer lines periodically and still moves the waste, without treatment, to a down line treatment facility;
- restaurant grease is the largest problem in municipal sewage plants because it reduces the efficiency of the plant's digesters and clogs machinery.

Drip enzyme treatment is an unacceptable alternative to pumping. A drip enzyme program introduces only enough enzymes into the interceptor to break up the grease, but not to fully metabolize it. A drip program that fully metabolized the grease would be prohibitively expensive. Drip programs are discouraged by municipal authorities, who realize that the dispersed grease will recombine to block the municipal system. Other unacceptable methods which only send the grease problem farther down the municipal line include hot water flushing and solvents to dissolve the grease.

Clemco Industries Inc. (Clemco) developed the LEGACY ***Blue Label*** drain line management program as an environmentally and economically superior alternative to pumping and enzyme treatment. McDonald's Restaurants of Canada Limited was the impetus for Clemco's efforts as a result of McDonald's ongoing programs to reduce restaurant waste on site. McDonald's and the City

of Vancouver, with the encouragement of the Greater Vancouver Regional District, requested that Clemco undertake a monitored field trial to demonstrate the effectiveness of the LEGACY™ program. Clemco agreed to conduct a trial at a McDonald's restaurant. This trial would be monitored by the City of Vancouver.

B. A National Commitment to Pollution Prevention

A great many of the guiding principles of Clemco's business are summarized in a document entitled A National Commitment to Pollution Prevention by the Canadian Council of Ministers of the Environment.

According to the document, "The Canadian Council of Ministers of the Environment (CCME) is the major intergovernment forum in Canada for discussion and joint action on environmental issues of national, international and global concern. Environment ministers from each of the ten provinces, the federal government, and the two territories participate in meetings at least twice a year. They discuss environmental issues, exchange information, make decisions and establish policy for work to be carried out under the auspices of CCME."

"The CCME has developed the following principles to guide pollution prevention:

- All Canadians are individually and collectively responsible for the quality of the environment, and should be involved in pollution prevention wherever they have the opportunity to do so;
- All jurisdictions should cooperate to harmonize their individual approaches to prevention;
- Voluntary action, regulation and economic instruments all have important, and often complementary roles to play in pollution prevention. All approaches for prevention should be considered, with a view to using the most effective approach, or combination of approaches. Voluntary actions will be encouraged;
- Prevention should be considered at the earliest possible point in the development of any concepts, plans, policies, products, projects or processes;
- Pollution prevention planning should be a continuing process, incorporating opportunities for improvement on an ongoing basis, such as new scientific and technological developments;
- Prevention should apply to the entire life cycle of a product, from resource extraction to final disposal (i.e., from cradle to grave);

- There should be an ongoing effort to ensure that prices better reflect the full costs of pollution, in order to understand the real benefits of prevention;

- Full use should be made of pollution prevention to achieve greater domestic and international competitiveness."

The role of government is key and is explicitly defined in the document. It reads, "All member governments of CCME undertake to advance pollution prevention. The following are some ways this can be achieved:

- Show leadership by establishing a climate in which pollution prevention can flourish, and develop cultures that encourage and reward prevention;

- Set an example through good stewardship, by keeping their "own houses in order";

- Establish partnerships to enhance the capacity to achieve pollution prevention goals, and to share the benefits and risks necessary to improve government, business and industrial practices;

- Provide the information that citizens need to make informed decisions;

- Influence the marketplace with economic instruments that provide people with incentives to make decisions that further pollution prevention;

- Re-orient a greater portion of research, science and technology towards pollution prevention;

- Incorporate, where feasible, innovative pollution prevention principles into legislation and regulations to support partnerships, create a "level playing field", advance competitiveness, promote behavioral change and ensure that the environment is protected."

These principles broadly provide for a cooperative relationship between industry and government, encouraging voluntary experimentation and implementation first and regulation in a supporting secondary role.

C. The LEGACY™ *Blue Label* Drain Line Management Program

Clemco provides commercial and industrial customers with environmentally friendly products and services. Clemco's objective is to provide "cradle to grave" products, whereby the customer purchases products or services where the

disposal of the product has been predetermined. The ultimate objective is that any waste generated from using the product never leaves the customer's site.

The LEGACY ***Blue Label*** drain line management program is a complete, on-site waste interceptor and non-sanitary drain line management service performed by Clemco's highly trained Service Representatives. It includes:

- 24 hour emergency service for blocked drain lines;
- regularly scheduled maintenance calls to treat the waste on site using Clemco's proprietary bioremediation process;
- hydrajet cleaning of all drain lines;
- available pumping service to remove accumulated sediment;
- drainage system design consultation;
- assessment of the status and compliance of the waste interceptor;
- assistance with regulatory authorities on drain line problems;
- advice on drain line techniques to avoid costly backups;
- extensive documentation on services performed for management and regulatory purposes;
- available complementary range of neutral pH cleaners, degreasers, sanitizers and deodorizers.

Literature is provided in Appendix B. Monthly service charges range from as low as $18.50 to $65.00 per interceptor depending on services, the number of interceptors on the site and the payment plan selected by the customer. Pumping is still required to remove biomass and sediment not consumed by the bioremediation process, but experience indicates that pumping frequency can be reduced to once every twelve to eighteen months for a typical interceptor. This compares to the traditional $70.00 to $90.00 or more per month for pumping charges.

The program provides an interceptor rating at each service call as described in Appendix C. Where permitted by customer management, the rating is recorded on a Service Record and displayed on site. A sample Service Record is provided in Appendix D. All site work is supported by an extensive computer database which records a large number of factors about each customer site, maintenance history and the work performed. These records are available to customers in periodic reports.

There are approximately two hundred sites in the lower mainland currently using the LEGACY™ ***Blue Label*** drain line management program. The following types of organizations are typical users:

- Fast food restaurants
- Supermarkets
- Full service restaurants
- Hotels
- Pubs and bars
- Golf courses

In designing its program, Clemco sought to provide its customers with an on site disposal alternative, a cost saving and an alternative to traditional pumping. The result was to base the LEGACY™ ***Blue Label*** drain line management program on bioremediation.

Bioremediation is the process of using bacteria to degrade hazardous or toxic wastes into benign substances. The process involves selecting and combining strains of bacteria to consume specific waste products. Each strain of bacteria feeds on a particular element or structure in the waste, with the objective to identify and select strains of bacteria to consume all elements that are present in the waste. The bacteria use the elements or structure as a food source, converting the food into water, carbon dioxide and heat while reproducing rapidly (counts can double every twenty minutes). Upon completion of the bioremediation process when the food is exhausted, the bacteria die and return to the environment.

All micro-organisms that are used in bioremediation processes are naturally occurring, non-pathogenic and not regulated because they exist naturally in the environment. There is no engineering of new strains of bacteria, but rather a selection effort from approximately three thousand strains that are currently available. The number of strains applied to a particular waste may range from three or four to dozens, and the selection process must consider one strain feeding on another as well as the target waste.

Master strains to consume a wide variety of wastes are available from a number of universities and private companies throughout North America. The micro-organisms are stored and shipped either granular or in liquid suspension. Clemco currently obtains its micro-organisms from United States suppliers.

Bioremediation is best known in the oil industry, where it has been used for approximately thirty years. Parts of the EXXON Valdez oil spill were cleaned using bioremediation.

D. Test purpose

The purpose of the test was to evaluate the LEGACY™ ***Blue Label*** drain line management program compared to traditional pumping in a field trial, and to provide recommendations to municipal authorities for increasing effluent compliance.

E. Test Protocol

The test was conducted on a fully independent basis. A protocol was developed and approved by McDonald's, the City of Vancouver, Bio-Research Laboratories Inc., and CanTest Ltd.

The test was conducted on the waste interceptor at the McDonald's restaurant at Terminal Avenue and Main Street in Vancouver between February 1 and May 24, 1994. This restaurant is reportedly one of the largest volume McDonald's in western Canada and the interceptor was formerly pumped two times per month at a cost of approximately $179.00 per month.

The interceptor size is approximately 2000 litres. The interceptor was repaired and placed into the configuration recommended by the City of Vancouver prior to the test. This involved the construction of a sampling tee and placement of baffles.

The first phase of the test was to clean and pump the interceptor, and to take weekly effluent samples for a period of four weeks. This was the traditional pumping scenario used in many interceptors.

The second phase of the test was to clean and pump the interceptor and to begin the LEGACY™ ***Blue Label*** drain line management program. The program included the establishment of the micro-organism colony and a maintenance visit (including maintenance seeding of the micro-organism colony) every four weeks along with full management support and training as described in an earlier section. The program was to run for six weeks with weekly effluent samples, but was increased to eighteen weeks to provide additional results.

The effluent was sampled by CanTest, with the sampling process attended by the City of Vancouver on the basis of a grab sample. A full explanation of the terms and the limits is provided in Appendix A.

Sampled Parameter	Unit of Measure	Grab Sample Limit
pH	pH units	5.0 - 11.0
Total suspended solids	mg/L	2400
Biochemical oxygen demand (BOD5)	mg/L	2000 [1]
Total oil and grease	mg/L	600
Chemical oxygen demand	mg/L	Not specified

Note (1) The BOD5 grab sample limit is 4000 mg/L for establishments that were operating at the time Bylaw 164 was enacted in 1990. The McDonald's test

site was constructed before 1990 and qualifies for the 4000 mg/L limit. This limit will be reduced to the 2000 mg/L for all establishments on January 1, 1996.

Additional parallel samples for some weeks were drawn by CanTest under the test protocol and provided to Bio-Research Laboratories Inc. for internal analysis of total oil and grease.

A signed test protocol is provided in Appendix E.

F. Test Results and Commentary

The raw data from the test results is provided in tabular form in Appendix F. In addition, a photograph of the interceptor on a weekly basis was taken, and the series is available for viewing by contacting Clemco directly.

A graph of the results of each test parameter (except COD, as there is no specified Bylaw 164 limit) follows. The sample weeks during the pumping portion of the test are designated P1 to P4, while the weeks on the LEGACY™ ***Blue Label*** drain line management program are designated L1 to L18. Each graph contains the following:

- the relevant Bylaw 164 grab sample parameter limit;
- weekly results for four weeks after pumping;
- weekly results for eighteen weeks after the startup of LEGACY™ ***Blue Label*** service;
- a four week moving average (4WMA) of each test parameter to smooth results. While Bylaw 164 is not enforced on the basis of a moving average, it is Clemco's opinion that based on the objective of the test, the 4WMA provides a more representative presentation of the actual state in the trap than the individual grab sample results.

In addition, the graph for total oil and grease shows the specific weekly results as reported by Bio-Research Laboratories Inc. for analysis of the samples provided to them.

Total Oil and Grease Commentary

This parameter was the main objective of the test program as reduction of total oil and grease is the principal goal of the LEGACY™ ***Blue Label*** drain line management program.

Weeks P1 to P4 show that a pumped interceptor exceeds the Bylaw 164 effluent limits after only two weeks . As there is no service to the interceptor other than pumping, it is likely that the effluent will continue to exceed the Bylaw 164 limits

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until a subsequent pumping, and for this reason, the pumping results portion was terminated after four weeks.

Weeks L1 to L18 indicate a number of interesting results. First, there are spikes in certain weeks that can be attributed to sampling variability. This is indicated by the difference between the CanTest analysis and the Bio-Research Laboratories analysis for samples that were drawn at the same time, by the same individual and under the same protocol. Second, even if the CanTest spiked results are included, the four week moving average returns to compliance within several weeks. Finally, fourteen of the eighteen weeks sampled were in compliance with Bylaw 164 limits without any averaging.

There are several possible reasons for sampling variability. These include the flow through the interceptor, even during a short sampling period, depth differences when drawing the sample from the interceptor, the effect of larger pieces of solids (e.g. grease or fat) which may be included in only one sample and the additional three days required to ship the Bio-Research samples to the United States for analysis.

The most important point to note is that during the eighteen week period of the test, **the interceptor was not pumped or cleaned in any way.** At the conclusion of the test, a buildup of sediment and biomass was occurring on the bottom of the interceptor, but as the test results show, this buildup was not affecting the effluent leaving the interceptor. One reason is that the interceptor was properly repaired before the test commenced, including the installation of proper elbows and the allowance of eight inches between the bottom of the interceptor and the inlet to the outflow test tee. As of the date of this report, which was prepared approximately after seventeen weeks, the interceptor continues to function in the same manner as the test results and is not scheduled for pumping.

BOD Commentary

BOD levels in the P1 to P4 weeks exceed the Bylaw 164 allowable limit of 2000 mg/L for sites constructed after 1990, but are in compliance with the 4000 mg/L allowed for the test site.

BOD levels indicate the same sampling variability as the total oil and grease results. The four week moving average BOD is approximately 3500 mg/L.

The micro-organism mix used in the LEGACY™ ***Blue Label*** drain line management program is primarily aerobic and designed to consume fat oil and grease. The BOD5 appears to come largely from material that is not consumed by the current micro-organism mix and that ultimately accumulates as biomass

on the bottom of the trap. Subsequent measurements of this biomass indicate that the BOD of the biomass is much higher than that of the effluent.

pH Commentary

pH is generally below 5 for all weeks and reflects the acidic water supply and the acidic nature of grease.

The spike noted in week L12 indicates that the sample was far less acidic than normal. An interpretation of the results is that the interceptor was subject to a large organic and anaerobic loading immediately prior to the sample, and digestion had not yet occurred. The cause would typically be a sink had been emptied into the interceptor. This hypothesis is supported by the corresponding high total oil and grease, total suspended solids and BOD results for the same week. It is further supported by a return to normal values in subsequent weeks.

Total Suspended Solids Commentary

Total suspended solids for all weeks were well within the Bylaw 164 allowable limits.

This would appear to reflect the disciplined use of sink strainers enforced in McDonald's restaurants, and the excellent maintenance condition of the interceptor itself. Specifically, it has properly placed baffles, is sized correctly for the site and has an outflow elbow greater than eight inches above the bottom to allow solids to settle.

General Commentary

In addition to the specific results of this test, Clemco has noted a number of other relevant factors based on its diversified field experience:

- interceptors vary widely in capacity and often bear little relationship to the waste flow of the food service establishment;
- most interceptors are poorly maintained. The most frequent problems are missing baffles, missing flow restrictors, outflow pipes that do not have an elbow or are less than eight inches above the bottom of the interceptor and improper plumbing that connects the wrong lines to the interceptor (or misses lines that should be connected);
- retention time in the interceptor improves performance of the micro-organism colony;

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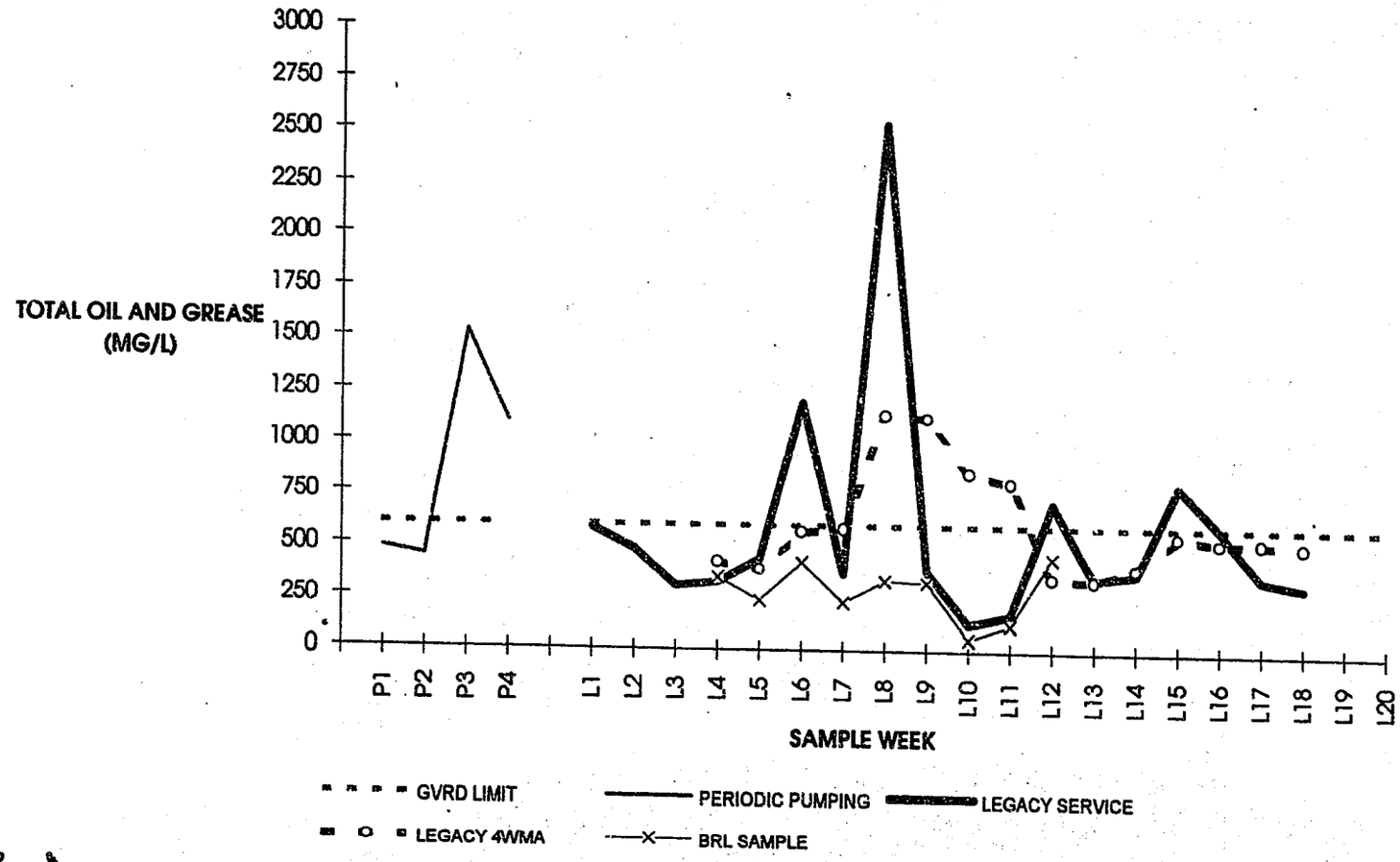
- the probability of effluent meeting guidelines is positively influenced by management programs that restrict chemicals and solids entering the interceptor;

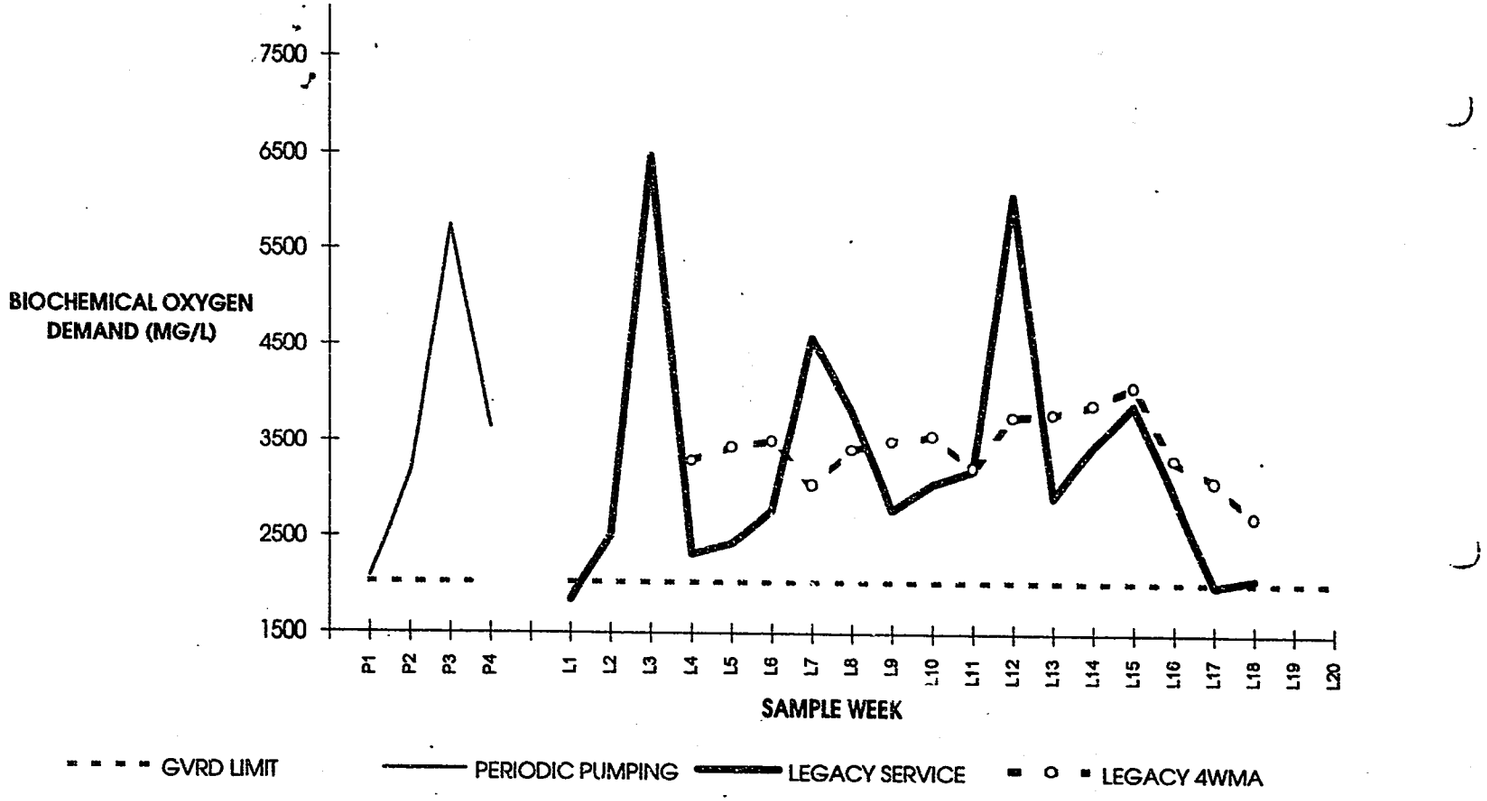
- many establishments are either uninformed about the function of their interceptor and its maintenance requirements, or blatantly do not maintain it as a cost saving measure;

- the current tipping fee at the Iona Island treatment plant is a maximum of $12.00 for one thousand five hundred gallons. Based on a typical interceptor of approximately two hundred gallons, the tipping fee is $1.60. This clearly does not approach the cost of disposal.

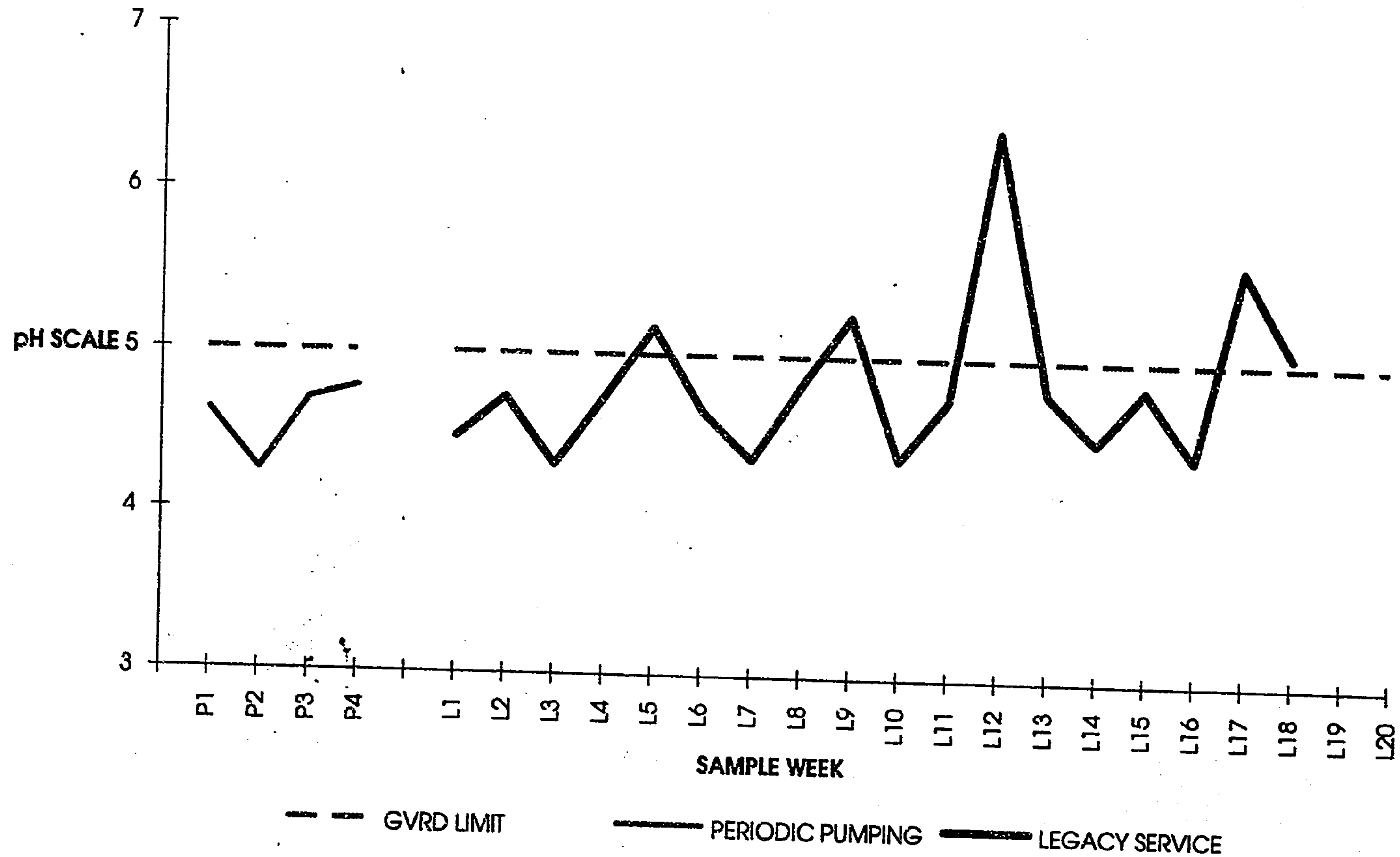
Clemco Industries Inc. Total Oil and Grease Test Results



Clemco Industries Inc. BOD Test Results



Clemco Industries Inc. pH Test Results



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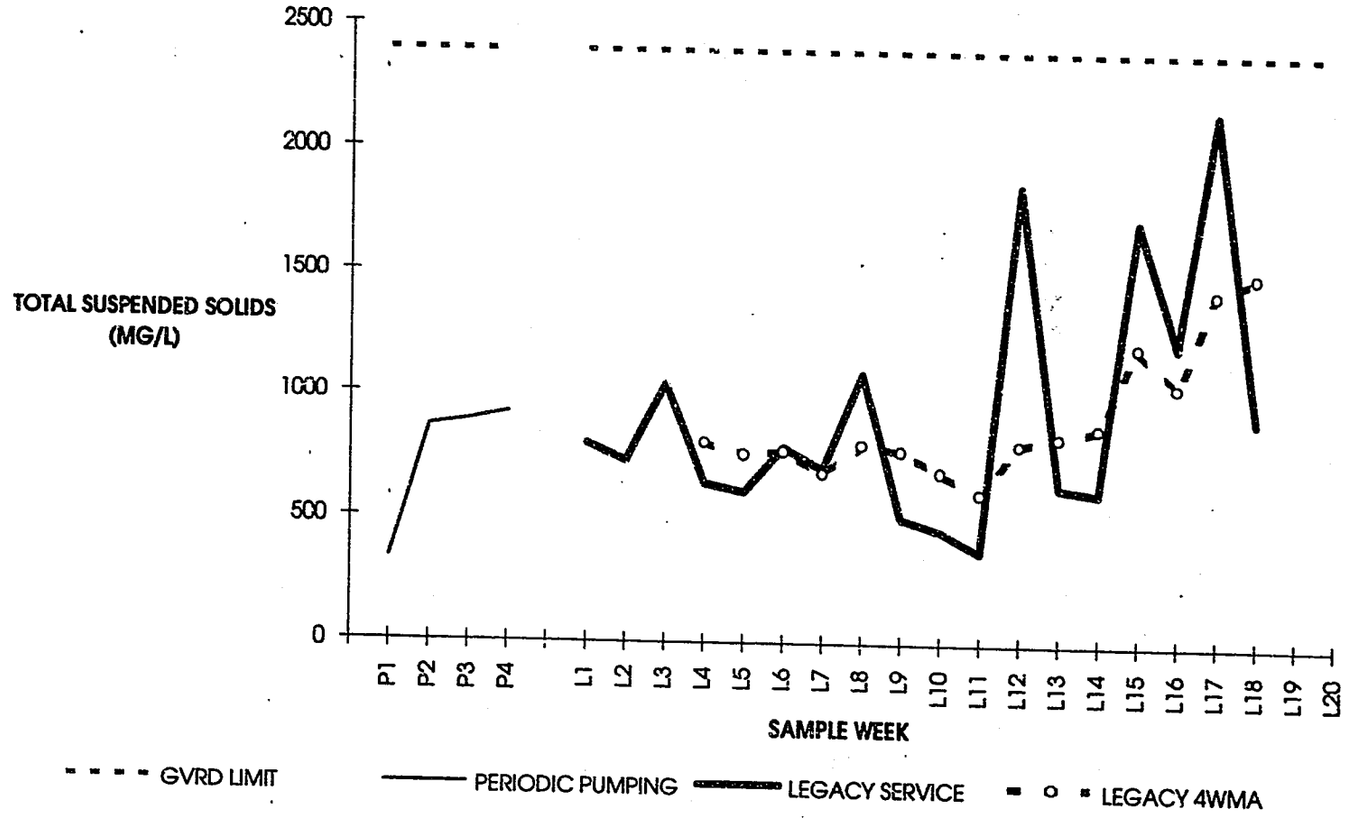
Clemco Industries Inc. Total Suspended Solids Test Results



G. Conclusions

Based on the data collected, the following conclusions are drawn:

1. Bioremediation **as part of a proper maintenance program** will keep a food service establishment in compliance with Bylaw 164 total oil and grease effluent limits on a sustained basis. The effectiveness of the bioremediation is clearly evident from the test, as the interceptor was not cleaned and the effluent remained in compliance throughout the test.

2. The LEGACY™ ***Blue Label*** drain line management programs saves money each month on a direct basis for an establishment that currently uses or requires monthly pumping of its interceptor. Additional saving occur on an indirect basis through the reduction of emergency blockages.

3. There are opportunities to modify the micro-organism mix to address a reduction of the BOD levels measured in this test. Clemco is already researching appropriate formulations under its continuing development program.

4. Just pumping the interceptor even on a monthly basis will not keep the food service establishment in compliance with Bylaw 164 effluent limits on a sustained basis.

5. Interceptor pumping can be reduced from twelve times per year to one time per year with a drain line management and bioremediation program. This will result in a substantial reduction in the restaurant grease delivered to Iona Island if applied across the GVRD and assuming that the effluent in the test is representative.

6. Current interceptor technology is adequate to meet or approach Bylaw 164 effluent guidelines if the establishment is diligent in its management of its influent and effluent.

7. Most food service establishments do not have a regular maintenance program on their interceptor or any other type of voluntary program to monitor and reduce their effluent. Reaction to blockage and overflow is a common service approach, rather than preventative maintenance.

8. Drip enzyme treatment and other methods of flushing fat, oil and grease through the interceptor negate the reason for the interceptor in the first place. The result is equivalent to a pipe connecting the establishment's sink directly to the municipal line.

9. With a bioremediation component, it is possible to regulate food service establishments into reducing their effluents while reducing their costs at the

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same time. A mandate can be implemented that is actually beneficial to the establishment from a financial perspective. Other indirect benefits such as reduced emergency blockages will also be obtained, and the municipality will have a reduction in the number of grease blockages in its own lines as well as a reduction of effluent at its treatment facilities.

H. Recommendations

The following recommendations are made:

1. The use of drip enzyme and chemical treatments in an interceptor, or any other treatment with the objective of causing fat, oil or grease to flow through the interceptor should be named and made illegal under Bylaw 164. Fines for a lack of treatment and maintenance should be severe, should increment with each occurrence and should be levied immediately on site.

2. Food service establishments should be subject to a bylaw requirement that they service their interceptor every month. The bylaw should initially apply to those establishments that have in excess of twenty seats (or equivalent measure for takeout operations without seating). The bylaw could be structured as follows:

- based on a "Waste Reduction Incentive" of $300.00 per year, to be assessed on the annual renewal of the establishment's business license.

  In lieu of paying the Waste Reduction Incentive, the establishment could provide a certificate from an approved vendor certifying that it carried out monthly service on its interceptor;

- service defined narrowly as pumping the interceptor or maintaining a bioremediation program. This definition could be expanded through industry consultation to encompass other acceptable programs or new technologies;

- service performed by private sector vendors approved by the GVRD to carry out the work. The establishment could select any approved vendor;

- monthly interceptor service would include:

  - interceptor service and written rating stored on site;
  - notation of any interceptor deficiencies from a recommended configuration developed by the municipality;
  - possible extension to other problem areas, including compactor, rendering bin and dumpster maintenance.

This type of program would cost little to administer at the municipal level, as all business license documentation is already generated and mailed. It would save money for the municipality on site as the Environmental Officer or the Health Inspector would not have to open the interceptor, but would only have to inspect the Service Record. The requirement would not cost anything for establishments that were legitimately maintaining their interceptor, as they would be provided with a Waste Reduction Incentive certificate by their vendor. Indirect benefits would include less pollution from pumping trucks driving around the lower mainland.

3. Significantly increase the tipping fee for restaurant grease at the Iona Island treatment plant. The tipping fee should be consistent with the CCME principle that, "There should be an ongoing effort to ensure that prices better reflect the full costs of pollution, in order to understand the real benefits of prevention." Tipping fee increases of ten to fifteen times for restaurant grease would not be unreasonable given the availability and cost savings of bioremediation based programs.

This preserves the option of pumping and trucking for those establishments that elect this method. However, they should have an economic disincentive to transfer their waste given that on site treatment is now technically and economically viable.

A recent program in Australia, for example, that licenses pumping trucks to pickup and dispose of waste was designed to ensure that the pumping trucks did not dispose of the waste illegally (as distinct from the objective of providing more efficient or lower cost waste handling and disposal alternatives to waste generators). Such programs can only add cost to both municipalities and food service establishments and are unnecessary if the incentive is given to treat waste on site and eliminate the need for pumping.

4. Municipal governments should encourage waste generators to experiment in the open, and be prepared to tolerate continuing non-compliance where an organization has voluntarily identified a problem and is experimenting to develop a solution. Enforcement efforts should not be based on whether an establishment meets the current Bylaw 164 guidelines on a single grab or composite sample, but rather on whether that establishment has a program in place to continuously improve its current situation. Enforcement should be vigorous on those establishments that do not meet effluent guidelines and do not demonstrate any desire to improve.

Appendix A
Excerpts from GVRD Sewer Use Bylaw Number No. 164

"BOD" means biochemical oxygen demand, being the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures in 5 days at 20 degrees Centigrade, expressed in milligrams per litre, as determined by the appropriate procedure in Standard Methods;

"Category I Discharge" means any discharge of Non-Domestic Waste into a Sewer in excess of 300m³ over any consecutive 30 day period;

"COD" means chemical oxygen demand, being the quantity of oxygen utilized in the chemical oxidation of organic matter under standard laboratory procedures, expressed in milligrams per litre, as determined by the appropriate procedure in Standard Methods;

"Combined Sewer" means a Sewer which carries Storm Waste and/or Cooling Waste in addition to other Waste;

"Composite Sample" means, unless otherwise specified by the Manager, a sample which is composed of equal portions of a specified number of Grab Samples collected at the same sampling point at specified time intervals during a specified sampling period;

"Contaminant" means any substance, whether gaseous, liquid or solid, whether dissolved or suspended, that:

(a) injures or is capable of injuring the health or safety of a person,

(b) injures or is capable of injuring property or any life form,

(c) interferes or is capable of interfering with the proper operation of a Sewer or Sewage Facilities,

(d) causes or is capable of causing material physical discomfort to a person, or

(e) damages or is capable of damaging the environment;

"Cooling Waste" means water that is obtained from a domestic water supply or other fresh water source which is used in an industrial, institutional or commercial cooling process and to which no substance has been added;

"District" means the Greater Vancouver Sewerage and Drainage District;

"District Sewage Control Manager" means a district sewage control manager appointed by the Board under this Bylaw;

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"Domestic Waste" means Waste produced on a property or premises which is solely used for residential purposes;

"Grab Sample" means an aliquot of a sampled stream or discharge collected at one particular time and place;

"Manager" means the Sewage Control Manager and includes any District Sewage Control Managers;

"Municipal Sewage Control Officer" means a municipal sewage control officer appointed by the Board under the Waste Management Act;

"Non-Domestic Waste" means all Waste except Domestic Waste, Sanitary Waste, Trucked Waste, Storm Waste and Cooling Waste;

"Officer" means any person appointed by the Board under this Bylaw to be an Officer and includes a Municipal Sewage Control Officer;

"Oil and Grease" means an organic substance recoverable by procedures set out in Standard Methods or procedures Authorized by the Manager and includes but is not limited to hydrocarbons, esters, fats, oils, waxes and high-molecular-weight carboxylic acids;

"Order" means an order issued by the Sewage Control Manager under the Waste Management Act;

"Person" includes an individual, firm, company, association, society, partnership, corporation, municipality, institution or other similar organization, agency or group;

"pH" means pH as defined and determined by the appropriate procedure described in Standard Methods;

"Prohibited Waste" means a Waste set out in Schedule "A" annexed hereto;

"Restricted Waste" means a Waste set out in Schedule "B" annexed hereto;

"Sanitary Waste" means Waste from sanitary conveniences of residential and non-residential property;

"Sanitary Sewer" means a Sewer which carries Sanitary Waste but is not intended to carry Storm Waste or Cooling Waste;

"Septic Tank Waste" means any Waste extracted from a cesspool, septic tank, sewage holding tank, seepage pit, interceptor or other containment for human excretion and wastes;

"Sewage Control Manager" means a sewage control manager appointed by the Board under the Waste Management Act and includes a Deputy Sewage Control Manager appointed by the Board;

"Sewage Facility" means works owned by the District or otherwise under the control or jurisdiction of the District that gathers, treats, transports, stores, utilizes or discharges Waste;

"Sewer" means all pipes, conduits, drains, and other equipment and facilities, owned or otherwise under the control or jurisdiction of the District, for collecting, pumping, and transporting Waste either to a Sewage Facility or otherwise and includes but is not limited to all such pipes, conduits, drains and other equipment and facilities which connect with those of the District;

"Special Waste" means special waste as defined in the Waste Management Act of British Columbia from time to time;

"Special Waste Regulation" means the Special Waste Regulation as amended from time to time pursuant to the Waste Management Act;

"Standard Methods" means the latest edition of "Standard Methods for the Examination of Water and Wastewater" jointly prepared and published from time to time by the American Public Health Association, American Water Works Association and the Water Pollution Control Federation;

"Storm Sewer" means a Sewer which is intended to carry Storm Waste and/or Cooling Waste;

"Storm Waste" means water resulting from natural precipitation from the atmosphere and which is intended to be transported in a Sewer;

"Suspended Solids" means the insoluble matter which either floats on the surface or is suspended in liquid and that is separable by the appropriate procedure described in Standard Methods;

"Trucked Waste" means any waste that is collected and transported offsite by means other than discharge to a Sewer, including but not limited to Septic Tank Waste, Oil and Grease from interceptors, and other sludges of organic origin;

"Waste" means any substance whether gaseous, liquid or solid, that is or is intended to be discharged or discarded, directly or indirectly, to a Sewer or Sewage Facility;

"Waste Discharge Permit" means a Waste Discharge Permit issued by a Manager under this Bylaw;

2. PROHIBITED WASTE, SPECIAL WASTE, STORM WASTE AND COOLING WASTE

2.1 No person shall discharge or allow or cause to be discharged into a Sewer or Sewage Facility any Prohibited Waste.

2.2 Subject to the Special Waste Regulation no person shall discharge or allow or cause to be discharged into a Sewer or Sewage Facility any Special Waste.

2.3 Unless he has received the prior Authorization of the Manager no person shall discharge or allow or cause to be discharged into a Sanitary Sewer any Storm Waste or Cooling Waste.

2.4 No person shall discharge or allow or cause to be discharged into a Storm Sewer any substance except Storm Waste, Cooling Waste and water resulting from the provision of municipal services such as street flushing, fire extinguishing activities and from traditional personal domestic activities such as lawn watering and car washing.

2.5 No person shall discharge or allow or cause to be discharged into a Sewer water or any other substance for the purpose of diluting any Non-Domestic Waste discharged into that Sewer.

2.6 Nothing in this Bylaw absolves a person discharging Waste from complying with the Special Waste Regulation and/or other applicable enactments.

2.7 No person shall discharge or allow or cause to be discharged into a Sewer or Sewage Facility any Waste in a concentration or quantity which may be or may become a health or safety hazard to personnel operating or maintaining Sewers or Sewage Facilities or which may interfere with the proper operation of a Sewer or Sewage Facility or which may injure or is capable of injuring the health of any person, property or any life form.

2.8 A municipality that is a member of the District shall not be guilty of an offence under subsections 2.1 to 2.7 inclusive where there is a discharge in violation of one or more of those subsections by a third party without the knowledge of that municipality into a sewer or sewage facility of that municipality which connects to a Sewer or Sewage Facility unless the municipality after becoming aware of such discharge fails forthwith to advise the District.

12.2 Where there is an offence that continues for more than one day, separate fines, each not exceeding $10,000, may be imposed for each day or part thereof in respect of which the offence occurs or continues.

12.3 Nothing in this Bylaw shall limit the District from utilizing any other remedy that would otherwise be available to the District at law.

13. GENERAL

13.1 The Board may from time to time amend this Bylaw in whole or in part and may without limiting the generality of the foregoing establish or amend criteria, charges and fees relating to the discharge of Non-Domestic Waste from specified classes of persons or specific persons.

13.2 In this Bylaw words importing the male gender include the female gender and either includes the neuter and vice versa and words importing the singular number include the plural number and vice versa.

13.3 The schedules annexed hereto shall be deemed to be an integral part of this Bylaw.

13.4 This Bylaw may be cited for all purposes as "Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw No. 164".

Read a FIRST time this 27th day of June 1990

Read a SECOND time this 27th day of June 1990

Read a THIRD time this 27th day of June 1990

Reconsidered, passed and finally adopted by the Administration Board of the Greater Vancouver Sewerage and Drainage District this 27th day of June 1990.

SEP 2 8 1994

G. J. Blair
Chairperson

Secretary

SCHEDULES

A & B

to

Greater Vancouver Sewerage and Drainage District

SEWER USE BYLAW

No. 164

6. PATHOGENIC WASTE

Any Waste containing infectious material which, by itself or in combination with any other substance, may create a Contaminant in a Sewer or Sewage Facility.

SCHEDULE "B"

RESTRICTED WASTES

Three different types of samples may be used under this By-Law for the purpose of classifying a Waste as a Restricted Waste in the following categories: pH WASTE, OIL AND GREASE WASTE, SUSPENDED SOLID WASTE, SPECIFIED WASTE, and BOD WASTE:

(1) One-operating-day Composite Sample(designated "A" in the tables attached): This sample is a Composite Sample of the discharge consisting of equal portions of Grab Samples collected at consecutive one-hour intervals over the duration of one operating day.

(2) Two-hour Composite Sample (designated "B" in the tables attached): This sample is a Composite Sample consisting of equal portions of 8 Grab Samples collected at consecutive 15-minute intervals.

(3) Grab Sample(designated "C" in the tables attached): This sample is defined in the definition section of this By-Law.

The concentration of different parameters used to define the Restricted Wastes mentioned above is varied according to the type of sample used to characterize the Waste. This Bylaw deems the concentration limits specified for the one-operating-day Composite Sample, two-hour Composite Sample, and Grab Sample to be equivalent.

The following are designated as Restricted Wastes:

1. FOOD WASTE

Any Non-Domestic Waste from cooking and handling of food that, at the point of discharge into a Sewer, contains particles larger than 0.5 centimetres in any dimension.

2. RADIOACTIVE WASTE

Any Waste that, at the point of discharge into a Sewer, exceeds radioactivity limitations established by the Atomic Energy Control Board of Canada from time to time.

3. pH WASTE

Any Non-Domestic Waste which, at the point of discharge into a Sewer, has a pH lower than 5.0 or higher than 11.0 as determined by a Grab Sample of the discharge, or less than 5.5 or higher than 10.5 as determined by a two-hour Composite Sample.

4. OIL AND GREASE WASTE

Any Non-Domestic Waste which, at the point of discharge into a Sewer, contains Oil and Grease in a concentration that is in excess of 150 milligrams per Litre as analyzed in a one-operating-day Composite Sample, 300 milligrams per Litre as analyzed in a 2-hour Composite Sample, and 600 milligrams per Litre as analyzed in a Grab Sample, and any Non-Domestic Waste which contains Oil and Grease derived from a petroleum source in a concentration that is in excess of 15 milligrams per Litre as analyzed in a one-operating-day Composite Sample, 30 milligrams per Litre as analyzed in a 2-hour Composite Sample, and 60 milligrams per Litre as analyzed in a Grab Sample.

5. SUSPENDED SOLID WASTE

Any Non-Domestic Waste which, at the point of discharge into a Sewer, contains suspended solids in a concentration that is in excess of 600 milligrams per Litre as analyzed in a one-operating-day Composite Sample, 1200 milligrams per Litre as analyzed in a 2-hour Composite Sample, and 2400 milligrams per Litre as analyzed in a Grab Sample.

SEP 2 8 1994

6. SPECIFIED WASTE

Any Non-Domestic Waste which, at the point of discharge into a Sewer, contains any substance, in a combined or uncombined form, with a concentration in excess of the levels set out below. All concentrations are expressed as total concentrations, which include both the dissolved and undissolved substances.

Substance	Expressed as	Concentration in milligrams per Litre A	B	C
Aluminum	Al	50.0	100.0	200.0
Arsenic	As	1.0	2.0	4.0
Boron	B	50.0	100.0	200.0
Cadmium	Cd	0.2	0.4	0.8
Chlorinated Phenols*	-	0.05	0.1	0.2
Chromium	Cr	4.0	8.0	16.0
Cobalt	Co	5.0	10.0	20.0
Copper	Cu	2.0	4.0	8.0
Cyanide	CN	1.0	2.0	4.0
Iron	Fe	10.0	20.0	40.0
Lead	Pb	1.0	2.0	4.0
Manganese	Mn	5.0	10.0	20.0
Mercury	Hg	0.05	0.1	0.2
Molybdenum	Mo	1.0	2.0	4.0
Nickel	Ni	2.0	4.0	8.0
Phenols	-	1.0	2.0	4.0
Silver	Ag	1.0	2.0	4.0
Sulphate	SO_4	1500.00	3000.0	6000.0
Sulphide	S	1.0	2.0	4.0
Zinc	Zn	3.0	6.0	12.0

NOTES: * Chlorinated phenols are the total of 2,3,4,5 and 2,3,4,6 tetrachlorophenols and pentachlorophenol.

Dissolved concentrations of any of the above substances higher than the Special Waste Regulation Leachate Quality Criteria (as amended from time to time) will qualify the Non-Domestic Waste, regardless of the sampling method used, as a Special Waste.

A = one-operating-day Composite Sample
B = two-hour Composite Sample
C = Grab Sample

7. BOD WASTE

Any Non-Domestic Waste which at the applicable implementation date has a BOD concentration, at the point of discharge into a Sewer, in excess of the following:

(a) For discharges which are in existence at the date of enactment of this By-Law:

Discharge Rate: (Cubic Metres/day averaged over any one month period)	Greater Than 500			Between 50-500			Less Than 50		
Implementation Date:	BOD Discharge Concentration Limit (milligrams/litre)								
	A	B	C	A	B	C	A	B	C
- January 1, 1992	1000	2000	4000	-	-	-	-	-	-
- January 1, 1994	500	1000	2000	1000	2000	4000	-	-	-
- January 1, 1996	500	1000	2000	500	1000	2000	500	1000	2000

(b) For discharges which commence after the date of enactment of this By-Law:

Discharge Rate: (Cubic Metres/day averaged over any one month period)	Greater Than 500			Between 50-500			Less Than 50		
Implementation Date:	BOD Discharge Concentration Limit (milligrams/litre)								
	A	B	C	A	B	C	A	B	C
- 90 days after enactment of this bylaw	500	1000	2000	-	-	-	-	-	-
- January 1, 1992	500	1000	2000	500	1000	2000	-	-	-
- January 1, 1994	500	1000	2000	500	1000	2000	500	1000	2000

NOTES:

A = one-operating-day Composite Sample
B = two-hour Composite Sample
C = Grab Sample

Appendix B
LEGACY Literature

SEP 2 8 1994

Clemco Industries Inc.

Corporate Office: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 1117

Vancouver Branch: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 111

LEGACY *Blue Label* Drain Line Management Program

The LEGACY ***Blue Label*** drain line management program. A complete, on-site waste interceptor and drain line management service performed by our highly trained LEGACY Service Representatives.

Including:

- 24 Hour emergency service for blocked drain lines;
- regularly scheduled maintenance calls to treat your waste on site using our unique bioremediation process;
- drainage system design consultation;
- assessment of the status and compliance of your waste interceptor;
- assistance with regulatory authorities on your drain line problems;
- advice on drain line techniques to avoid costly backups;
- extensive documentation to help you manage your facility at its optimum efficiency;
- available complementary range of neutral pH cleaners, degreasers, sanitizers and deordorizers.

The Future is Here Today!

The LEGACY ***Blue Label*** program with our proprietary bioremediation service is the future for handling waste in the food service industry's drain line system. It:

- saves money;
- treats your effluent on site;
- eliminates or greatly reduces the need for pumping;
- avoids drain line backups;
- avoids municpal fines;
- reduces or eliminates odors from your drain lines and waste interceptor;
- reduces the use of hazardous acid or caustic drain cleaners to protect you and your staff;
- reduces plumbing costs;
- eliminates costly, toxic and ineffective chemical treatment (ie. enzymes, solvents, etc.);
- eliminates the need for you or your staff to deal with your drain lines or waste interceptor.

Who Uses LEGACY *Blue Label* Service?

LEGACY services over one hundred customers in the lower mainland. Many are multiple site companies, or have more than one waste interceptor on each site. Our customers range from small grease traps that were pumped at up to six months intervals, to high volume operations that were formerly pumping up to twice monthly. The following types of organizations are typical users:

•Fast food restaurants	•Hotels	•Supermarkets	•Full service restaurants
•Government cafeterias	•Schools	•Golf courses	•Pubs and bars

"Products and services to preserve our natural resources"

Document number: DC00011	Date issued: July 5, 1994	Replaces date: June 6, 1994	Not valid after: N/A

Why Avoid Pumping and Drip Enzymes?

The food service industry is required by law to maintain waste interceptors (often called grease traps) to prevent cooking fats, oils and grease from entering the municipal sewer system and to maintain certain effluent standards. Waste interceptors were traditionally pumped (as frequently as every two weeks), and the resulting waste trucked to a specific municipal sewage treatment plant for disposal. The problems with pumping are:

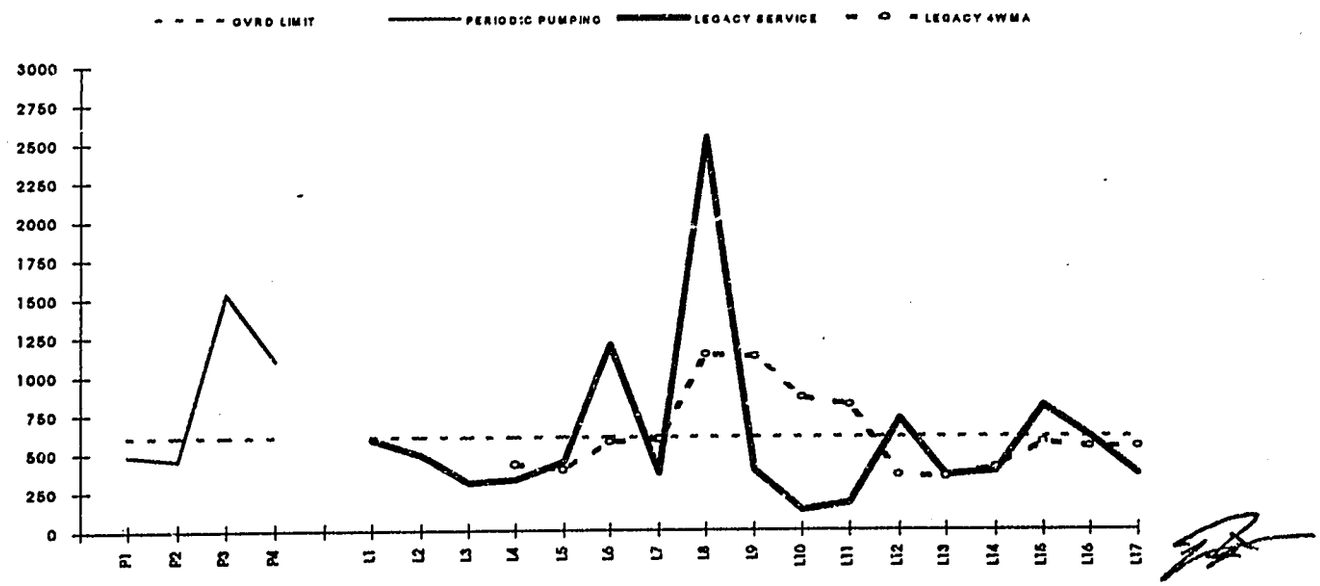
- it is expensive;
- it is noisy, smelly and disruptive to both staff and customers;
- it only removes waste periodically, and the trap rapidly fills again;
- it doesnot maintain continued compliance with municipal effluent guidelines;
- restaurant grease is the largest problem in municipal sewage plants because it reduces the efficiency of the bacteria in the plant's digesters (a long time use of bioremediation) and clogs machinery.

Drip enzyme treatment is an unacceptable alternative to pumping. Drip programs introduce only enough enzymes to the interceptor to break up the grease but not fully metabolize it. Such programs are discouraged by municipal authorities, who realize that the dispersed grease will recombine to block the municipal system. Drip enzyme programs are currently under consideration for bylaw restriction in a number of United States and Canadian jursidictions. Other unacceptable methods which only send the grease problem farther down the municipal line include hot water flushing and solvents to dissolve the grease.

Proven in the Field!

Through extensive testing using an independent laboratory, an international fast food chain and the active involvement of local municipal authorities, we have documented and proven that the LEGACY ***Blue Label*** program outperforms all other systems currently used to handle food service effluent.

The following is a graph of actual Total Oil and Grease (TOG) results of the LEGACY ***Blue Label*** drain line management program as compared to pumping the same trap monthly. The test site was an international fast food restaurant in Vancouver **where the waste interceptor was formerly pumped every two weeks**, and the results were obtained by an independent laboratory under the monitoring and protocol approval of the City of Vancouver. **Even after sixteen weeks on the LEGACY *Blue Label* program, no pumping was required or planned!**



Be Part of the Solution!!!

SEP 2 8 1994

Appendix C
LEGACY Interceptor Rating Standards

Clemco Industries Inc.
Corporate Office: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 1117
Vancouver Branch: 110 - 4471 No. 6 Road Richmond, BC, Canada V6V 1P8 Tel: (604) 244 1116 FAX: (604) 244 1117

LEGACY *Blue Label* Drain Line Management Program

Interceptor Rating System

Appearance	Color	Depth	Odor	Rating
Soft and puffy	Buff	To 2 cm.	Little	A
Soft and puffy	Caramel	To 13 cm.	Slight	B
Hard and puffy	Brown with white flecks	To 30 cm.	Evident	C
Hard and concrete like	Dark brown with black flecks	Over 30 cm.	Strong	D

SEP 2 8 1994

"Products and services to preserve our natural resources"

Appendix D
LEGACY Service Record

LEGACY™

Clemco Industries Inc.

Service Record

Date of Service	Rating	Serviced by	Customer

Call (604) 244-1116 24 hours

For complete drain line and wastewater interceptor service

"Products and services to preserve our natural resources"

Document number: DC00004	Date issued: April 14, 1994
Replaces date: N/A	Not valid after: N/A

SEP 2 8 1994

Appendix E
Test Protocol

BIO RESEARCH LABORATORIES, INC.
2807 152nd Avenue N.E.
Redmond, WA 98052-5514
(206) 869-4224 FAX: (206) 869-4231

SUMMARY OF STUDY PROTOCOL

Study Title: Bio Remediation Agent Efficacy Study

Test Sponsor: Clemco Industries, Inc.
110–4471 No. 6 Road
Richmond, BC, V6V 1P8
Canada

Test Facility: CanTest
200 – 1523 West 3rd, Vancouver, B.C.
phone: (604) 734–7276; fax: (604) 731–2386

Study Number: To be assigned at study initiation.

Purpose of the Study: To evaluate the effectiveness of a bioremediation agent.

Study Monitor: John J. Majnarich, Ph.D., Bio Research Laboratories, Inc.
Redmond, WA 98052

Study Director: Richard Jornitz
Cantest, 200 – 1523 West 3rd, Vancouver, B.C.
phone: (604) 734–7276; fax: (604) 731–2386

Records Maintained: All raw data, final reports, documentation, and protocol will be maintained in Test Facility's Archives.

Record Retention: All raw data and completed notebooks.

SEP 2 8 1994

STUDY PROTOCOL

A. Purpose

The purpose of this study is to determine the effectiveness of Clemco's bio remediation agent in treating oil and grease from trade waste interceptors and to evaluate the treatment's impact on the sewer collection system.

B. Study Protocol

This study will compare the effluent characteristics entering the sewer collection system from a commercial grease trap before and after the implementation of Clemco's treatment program.

First the location of the study will be agreed to by all parties and the sample collection point and protocol will be in place.

On day 0, the study will begin by pumping out the existing interceptor and jet cleaning the drain lines.

On days 7, 14, 21 and 28 grab samples will be collected by the testing facility, fully utilizing proper chain of custody forms and other collection protocols. The samples will be kept in a cool environment during shipment to the test facility. Notes should be taken regarding the consistency of the grease layer in the trap including the thickness (if possible), as well as the appearance and condition of the discharge to the sewer.

Analysis of the samples are to be conducted by the testing facility for the following parameters.

1. Oil and Grease (total)
2. pH
3. Total Suspended Solids (TSS)
4. Biochemical Oxygen Demand (BOD_5)
5. Chemical Oxygen Demand (COD)

On day 28, after sample collection the interceptor tank will be pumped and filled and Clemco's bioremediation agent will be added.

On days 35, 42, 49 and 56 grab samples will be collected by the testing facility, fully utilizing proper chain of custody forms and other collection protocols. The samples will be kept in a cool environment during shipment to the test facility. Notes should be taken regarding the consistency of the grease layer in the trap including the thickness (if possible), as well as the appearance and condition of the discharge to the sewer.

On day 56 a boost of the bioremediation agent will be added to the interceptor tank. On days 63 and 70 the final grab samples will be collected by the testing facility for review, under the same sampling protocol as above.

Analysis of the samples are to be conducted by the testing facility for the following parameters:

1. Oil and Grease (total)
2. pH
3. Total Suspended Solids (TSS)
4. Biochemical Oxygen Demand (BOD_5)
5. Chemical Oxygen Demand (COD)

On days 21, 35 and 42, additional 1 liter samples will be collected for shipment to Bio Research Laboratories, Inc. for further analysis.

Table I: Summary Of Experimental Design

Day	Activity	BRL testing
0	Pump existing interceptor tank and jet lines	
7	sample outflow	
14	sample outflow	
21	sample outflow	
28	sample outflow pump interceptor tank and jet lines, fill tank, add bio remediation agent	sample outflow
35	sample outflow	
42	sample outflow	
49	sample outflow	
56	sample outflow and add bio remediation agent	sample outflow
63	sample outflow	sample outflow
70	sample outflow	sample outflow

C. City of Vancouver and GVRD involvement:

The City of Vancouver and the GVRD will coordinate their review and oversight of this study through Mr. Doug Roberts, Supervisor, Environmental Protection Branch Permits and Licenses Department, City of Vancouver.

This oversight will include approval of the test site, the sample collection protocol, visual inspections of the sewer lines to be conducted before and after treatment as specified above.

A copy of the final report by CanTest and Bio Research Laboratories will be sent to the City of Vancouver and the GVRD for their review and analysis.

Approval Of Protocol

Study Location: McDonalds Restaurant
Main/Terminal – Vancouver, B.C.

Day 0: Monday, January 24, 1994

Study Director

Richard Jornitz — Date
Cantest,
200 – 1523 W. 3rd, Vancouver, B.C.
phone: (604) 734–7276; fax: (604) 731–2386

Study Monitor

John J. Majnarich, Ph.D. — 4/7/94 Date
Bio Research Laboratories, Inc. (206) 869–4224

Study Oversight

Mr. Doug Roberts, Supervisor, Environmental Protection Branch
Permits and Licenses Department, City of Vancouver, Canada
Mary Gurney, (604) 873–7122, Permits & Licenses Dept., City of Vancouver

Appendix F
Raw Test Data

CLEMCO INDUSTRIES INC.
RAW TEST RESULTS

			pH ANALYSIS				TOTAL SUSPENDED SOLIDS ANALYSIS				TOTAL BIOCHEMICAL OXYGEN DEMAND			
SAMPLE DATE	LEGACY PRODUCT	WEEK	LOWER LIMIT	PUMPING	LEGACY RESULTS	LEGACY 4W MOVING AVERAGE	GRAB LIMIT	PUMPING (MG/L)	LEGACY RESULTS (MG/L)	LEGACY 4W MOVING AVERAGE	GRAB LIMIT	PUMPING (MG/L)	LEGACY RESULTS (MG/L)	LEGACY 4W MOVING AVERAGE
Feb 01, 1994	NONE	P1	5.0	**4.62**			2400	**335**			2000	**2060**		
Feb 08, 1994	NONE	P2	5.0	**4.25**			2400	**862**			2000	**3150**		
Feb 15, 1994	NONE	P3	5.0	**4.70**			2400	**888**			2000	**5750**		
Feb 22, 1994	NONE	P4	5.0	**4.78**			2400	**921**			2000	**3660**		
Mar 01, 1994	BP	L1	5.0		**4.48**		2400		**793**		2000		**1820**	
Mar 07, 1994	BP	L2	5.0		**4.73**		2400		**725**		2000		**2520**	
Mar 15, 1994	BP	L3	5.0		**4.31**		2400		**1040**		2000		**6680**	
Mar 22, 1994	BP	L4	5.0		**4.74**		2400		**638**	799	2000		**2310**	3283
Mar 29, 1994	BP	L5	5.0		**5.17**	4.7	2400		**606**	752	2000		**2430**	3435
Apr 05, 1994	BP	L6	5.0		**4.66**	4.7	2400		**784**	767	2000		**2780**	3500
Apr 11, 1994	BP	L7	5.0		**4.36**	4.7	2400		**698**	682	2000		**4580**	3025
Apr 19, 1994	BP	L8	5.0		**4.83**	4.8	2400		**1090**	795	2000		**3830**	3405
Apr 26, 1994	BP	L9	5.0		**5.26**	4.8	2400		**508**	770	2000		**2780**	3493
May 03, 1994	BP	L10	5.0		**4.37**	4.7	2400		**458**	689	2000		**3040**	3558
May 10, 1994	BP	L11	5.0		**4.75**	4.8	2400		**372**	607	2000		**3180**	3208
May 17, 1994	BP	L12	5.0		**6.42**	5.2	2400		**1860**	800	2000		**6070**	3768
May 24, 1994	BP	L13	5.0		**4.80**	5.1	2400		**634**	831	2000		**2910**	3800

SEP 2 8 1994

THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Environmental Protection Committee DATE: September 22, 1994

FROM: J.E. Yip, P. Eng., Deputy City Engineer FILE: EPC

SUBJECT: **PRELIMINARY DRAFT - DOWNTOWN PARKING STUDY**

BACKGROUND & COMMENTS:

The Planning Committee has referred the attached preliminary draft of the Downtown Parking Study for the Committee's review and comments.

In reviewing the draft report the following comments are provided for the Committee's review, discussion and consideration:

1) Included in the study, a complete inventory of available City, on and off street parking.

2) Identify, investigate and consider other methods to manage parking, such as:

   (i) parking meters for on street parking
   (ii) pay parking lots and structures
   (iii) joint facilities with major parking management company such as IMPARK. Have company front end cost of parking structure and City provide land.
   (iv) adopt a user pay policy to establish and maintain parking fund.

3) Identify what parking arrangements can be accommodated on City owned lands within the designated area (existing sites).

4) Carry out an overall review to determine the best locations for future parking lots and/or structure(s).

5) Future parking requirements may be impacted by:

   (i) Commuter rail
   (ii) Rapid Transit
   (iii) Community buildings

6) Carry out a study to evaluate current on street parking. Assess the present restrictions and review the need for other timed, daily or monthly parking requirements.

7) In the review of parking management mechanisms include methods used by private companies (ex. Impark).

J. E. Yip, P. Eng.
Deputy City Engineer

JEY:cd

SEP 2 8 1994

THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Tony Chong
Budget and Administration Committee

Igor Zahynacz
Public Works Committee

Jeff Yip
Environmental Protection Committee

Janna Taylor
Parks and Recreation Committee

DATE: September 1, 1994
FILE: Parking

FROM: Carlos Felip
Director of Planning

RE: Preliminary Draft-Downtown Parking Study

Planning Committee is referring the attached preliminary draft of the Downtown Parking Study to your Committee for review and comments.

In order that the report may incorporate your Commitee's input prior to being submitted to Council, Planning Committee has requested that comments be forwarded to the Planning Department by **October 3, 1994.**

If you require additional time to review the report, please advise me as soon as possible.

Carlos Felip, M. Arch., M.C.I.P.
Registered Planner, Director of Planning

JL/gg

C/D/Memo/Aug94m/Parking

SEP 2 8 1994

DRAFT

July 13, 1994

DOWNTOWN OFF-STREET PARKING STUDY

TABLE OF CONTENTS

Draft: July 13, 1994

CITY OF PORT COQUITLAM

DOWNTOWN OFF-STREET PARKING STUDY

1.0 INTRODUCTION

The City of Port Coquitlam has experienced a rapid growth in population over the past several years. Between 1986 and 1991, the numbers increased 27% from 29,000 to 37,000 residents. With an ample supply of residential land and a healthy housing market, these trends do not show signs of abatement.

The influx of new residents into the City is generating more traffic into the Downtown core and more demand for goods and services. The increased business traffic has also resulted in a shortage of parking in the Downtown. A contributing factor to this parking shortage is the fact that many buildings in the Downtown do not meet current bylaw standards for the provision of off-street parking. Some of the older buildings rely solely on street parking and either have no off-street parking or are far below present-day requirements

With the parking shortage in the Downtown reaching a critical stage, the issue must be examined in order to determine parking needs and a long-range plan of action. Over the long term, the Downtown will continue to develop and re-develop as the City's business and employment centre. Therefore, adequate parking must be provided in the Downtown for customers and employees if the Downtown is to remain convenient to local residents and economically viable to local businesses.

1.1 Purpose of the Study

In this study, the Downtown is defined as the commercial-designated lands located north of Wilson Avenue, south of the railway underpass, and from the west side of Shaughnessy Street to Kingsway Avenue.

This study:

a. Estimates current and future parking needs;
b. Reviews current mechanisms used by the City to manage parking;
c. Reviews methods used in other municipalities to address parking shortages;
d. Recommends a policy plan and methods of implementation for consideration.

2.0 CURRENT MUNICIPAL REGULATIONS AND POLICIES

2.1 Municipal Act Powers

The power of a municipality to regulate parking provision is derived from the Municipal Act. The Act specifies that a local government may:

a. establish bylaws to require that off-street parking be provided for any land, building or structure;
b. classify uses, buildings and structures and differentiate between these classes with respect to the amount of parking spaces provided;
c. acquire property for the provision of off-street parking facilities;
d. construct, maintain and operate public off-street parking facilities;
e. collect cash-in-lieu of providing the required amount of parking and place these monies into a reserve fund for the purpose of parking provision.

2.2 The Development Management Bylaw

Port Coquitlam's "Development Management Bylaw, 1987, No. 2241" regulates the number of parking stalls required for various types of residential, commercial and industrial development. In addition to quantity, the bylaw also specifies the minimum size for parking stalls, loading areas, and maneuvering aisle widths.

All development is required to provide a certain amount of off-street parking. The number of required stalls varies according to type and intensity of use. Relaxation of the parking requirements is generally not granted to new developments without extraordinary justification.

2.3 The Official Community Plan

The Official Community Plan contains general policies that encourage parking in commercial areas to be located underground or within a parking structure. Design guidelines within the O.C.P. require that surface parking lots be interplanted with landscaped islands and that a landscape screen be provided where they are exposed to major streets. The O.C.P. policies help to promote a more aesthetic treatment of parking areas in the City.

3.0 ANALYSIS OF PARKING REQUIREMENTS IN THE DOWNTOWN

For this study, the following three scenarios were used to determine parking requirements:

a. Current Scenario - This looks at the amount of off-street parking that is presently required versus the amount that is actually provided in the Downtown.
b. Medium-Term Development Scenario - The medium-term is deemed to be over the next ten years. It is expected that during this time, lands that are now vacant in the Downtown will develop with two to three storey buildings, some of which will be mixed-use residential and commercial.
c. Long-Term Development Scenario - The long-term scenario forecasts the amount of development that will be accommodated in the Downtown when complete redevelopment ultimately occurs. It is anticipated that in the long-term, lands in the Downtown will be more intensively developed with multi-storey mixed-use buildings.

The latter two development scenarios reflect the continued population growth in the City that will generate additional demand for goods and services by residents. Forthcoming projects in the Downtown such as the new Provincial Courthouse will generate employment opportunities and new demand for related business services. With the addition of this major institutional facility, which will help to reinforce the Downtown, development of vacant sites is anticipated in the short term and redevelopment of older properties will likely occur over the long term.

Furthermore, many of the sites in the Downtown are presently underdeveloped and do not maximize site potential. The zoning regulations in the Downtown permit multi-storey development, underground parking, and residential uses above ground floor commercial. New development in the Downtown is encouraged to take advantage of this potential and make more intensive use of the land.

In all three scenarios, certain assumptions were made about the amount of land in the Downtown that have development potential. The following lands were deemed to have no development potential (and were therefore excluded from the total land available for development) because their use will not likely change over the long-term: three City-owned parking lots, two City parks, and the Hydro substation. Two apartment buildings at 2233 and 2235 Wilson Avenue were also excluded because they do not have a commercial use component and are deemed to satisfy their own parking requirements. The Provincial Courthouse site was also excluded from the total land available for development because it will also satisfy its own parking requirements.

3.1 Current Parking Requirements

This section estimates the number of parking spaces currently required in the Downtown according to existing use and compares it to the number of off-street parking spaces that are actually provided. This comparison will determine the extent of the parking shortage in the Downtown.

Once the total floor area (of office and retail uses) and the number of seats (of restaurant and assembly uses) were determined, the parking standards of the "Development Management Bylaw, No. 2241" were applied to calculate the parking requirements.

Table 1 below shows the amount of parking required and provided in the City.

Table 1:
Current Parking Requirements and Provision in the Downtown

Required Parking:

Use	Amount of Floorspace/ Number of Seats or Units	Parking Standard	Required Parking
Office	9,913 m2	1 space per 45 m2	221 spaces
Retail	20,798 m2	1 space per 47 m2	443 spaces
Restaurant	1,649 seats	1 per 5 seats	330 spaces
Assembly	1,068 seats	1 per 10 seats	107 spaces
Residential	74 units	1.7 spaces per unit	126 spaces
		Total Parking Required:	**1,227 spaces**

Provided Parking:

Municipal Parking Lots	234 spaces
Private Off-Street Parking Areas	767 spaces
Total Parking Provided:	**1,001 spaces**

3.2 Medium-Term Parking Requirements

Over the next ten years, it is expected that most of the new development within the Downtown will occur on presently vacant sites. For the purpose of forecasting the amount of new commercial floorspace, vacant lots are assumed to develop with two-storey buildings, 40% site coverage and 50% of the lot area available for surface parking. Half of the total floor area provided in the second storey of new development is assumed to be used for office purposes and the remaining half to be used for residential units. The proportion of restaurant to retail use at the ground level is based on proportions currently found in the Downtown.

The remaining developed lands in the Downtown are not expected to redevelop or change substantially. Table 2 below summarizes the parking requirements for the mid-term development scenario.

Table 2:
Parking Requirements of the Medium-Term Development Scenario

Required Parking:

Use	Forecasted Amount of Floorspace/No. of Seats or Units	Parking Standard	Required Parking
Office	14,297 m2	1 space per 45 m2	318 spaces
Retail	29,952 m2	1 space per 47 m2	638 spaces
Restaurant	2,685 seats	1 per 5 seats	537 spaces
Assembly	1,068 seats	1 per 10 seats	107 spaces
Residential	125 units	1.7 spaces per unit	213 spaces
		Total Parking Required:	**1,813 spaces**

Provided Parking:

Municipal Parking Lots	234 spaces
From development on presently vacant lands	346 spaces
Existing Private Off-Street Parking Areas	702 spaces
Total Parking Provided:	**1,282 spaces**

3.3 Long-Term Parking Requirements

The final scenario considers the amount of commercial floorspace in the Downtown when it reaches a point of ultimate saturation with new development. Some broad assumptions were made about the type and form of new development that could occur in order to reach a realistic conclusion of how the Downtown will appear in the long-term.

For this scenario, it is assumed that 50% of the developable land area in the Downtown will be occupied with three-storey, mixed-use buildings that have a floor area ratio of 2.1. Parking for these types of buildings will be contained in an underground structure; therefore, virtually 100% of the site area is available for parking provision.

The remaining 50% of the developable lands is anticipated to develop with two-storey commercial development with a site coverage of 50%. These developments are expected to provide surface parking. It is also assumed that these developments will not contain a residential component.

Table 3:
Parking Requirements of the Long-Term Development Scenario

Required Parking:

Use	Forecasted Amount of Floorspace/No. of Seats or Units	Parking Standard	Required Parking
Office	47,857 m2	1 space per 45 m2	1,064 spaces
Retail	35,765 m2	1 space per 47 m2	761 spaces
Restaurant	2,980 seats	1 per 5 seats	597 spaces
Assembly	1,402 seats	1 per 10 seats	141 spaces
Residential	290 units	1.7 spaces per unit	493 spaces
		Total Parking Required:	**3,056 spaces**

Provided Parking:

Municipal Parking Lots	234 spaces
Off-street Parking Areas in new development	1,738 spaces
Total Parking Provided:	**1,972 spaces**

3.4 Summary of Parking Requirements

Table 4 below summarizes the three scenarios in order to illustrate the present day parking deficit and the potential shortages over the medium and long term.

Table 4:

Summary of Parking Requirements in the Downtown

	Present Day	Medium-Term Scenario	Long-Term Scenario
Required Parking Spaces	1,227	1,813	3,056
Provided Parking Spaces	1,001	1,282	1,972
Parking Deficit	**226**	**531**	**1,084**

The above table shows that Downtown Port Coquitlam presently requires over 200 more off-street parking spaces to meet the proper standards of the "Development Management Bylaw, 1987, No. 2241". As the Downtown continues to develop and redevelop in a more intensive manner, it will become increasingly more difficult to meet parking requirements on-site.

Over the next ten years, if the present day deficit is not eliminated, the City can anticipate shortages of over 500 parking spaces as vacant lands in the Downtown develop. Once the City has reached its level of ultimate development, there may be a shortage of over 1,000 parking spaces if there are no policies or provisions in place to create new off-street parking.

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4.0 MECHANISMS FOR MANAGEMENT OF PARKING

4.1 Current Parking Management Mechanisms in Port Coquitlam

4.1.1 Parking Rental

Many older commercial buildings in Port Coquitlam were built prior to the establishment of parking standards. Consequently, many of these buildings do not provide adequate off-street parking to meet today's needs.

Businesses in Port Coquitlam that cannot meet off-street parking requirements must rent parking from the City. Currently, a business pays, for each deficient parking space, a one-time fee of $350 and $7.50 per month thereafter. The business is <u>not</u> assigned a specific space in a lot or on the street for its exclusive use. This system is strictly cash-in-lieu of meeting its parking requirements. The collected funds are used for on-going maintenance of public parking lots and for acquiring more land for parking.

In 1994, a total of 283 "spaces" were rented among 11 businesses and organizations in the City of Port Coquitlam, all of which were located in the Downtown.

4.1.2 Municipal Parking Facilities

The City presently owns and maintains three surface parking lots in the Downtown. These lots provide a total of 234 parking stalls for the public that are free of charge. The lot at the corner of Wilson Avenue and Donald Street, which is most central to the Downtown, has a three-hour time limit and is intended primarily for use by shoppers. The two other lots, located at the periphery of the Downtown, provide all-day parking to accommodate people who work in the Downtown or who want to leave their cars for the day in order to use public transit to commute to other municipalities.

4.1.3 Off-Site Parking Provisions

Under the provisions of the Development Management Bylaw, required parking does not have to be located on the same parcel as the use for which the parking is required. Section 8(b) of the Bylaw states that required off-street parking spaces can either be located on the same parcel, or

> "on a parcel or portion of a parcel located within 95 m (322.91 ft.) of the building for which they are required, provided that annexed to such parcel is a covenant registered in favour of the Municipality that the parcel or portion of the parcel concerned shall continue to be used solely for parking purposes."

While "off-site parking" is currently permitted in Port Coquitlam, there is no business that is taking advantage of it in the formalized manner outlined above.

Several other municipalities also have similar provisions within their local bylaws. They specify that a lot up to 150 or 200 metres away may be used to meet another lot's parking requirements. There is also a condition to register a covenant in the municipality's favour to ensure that such parking would be provided as long as required.

4.1.4 Evaluation of Current Parking Management Mechanisms in Port Coquitlam

Parking Rental

The collection of monthly rents for parking spaces allows the City to generate some revenue for ongoing maintenance of existing municipal parking lots and to accumulate funds for future acquisition of lands for parking purposes. Port Coquitlam is the only municipality in the Lower Mainland that uses a monthly rental system. It has a number of shortcomings which include the following:

a. It takes a long time to generate sufficient funds for property acquisition because the monthly rates are low;
b. Monthly collection requires staff time and administration on a regular and frequent basis;
c. The businesses that rent spaces do not actually get a space assigned to them for their use.

Municipal Parking Facilities

The municipal lots provide 234 parking stalls in three locations in the Downtown. Even if the businesses that rent spaces from the City were assigned an actual parking stall in one of these lots, there would not be enough stalls as there are over 280 being rented.

There is a need to evaluate the municipal lots to ensure that they are efficient and attractive to users. As some of the lots are located at the periphery of the Downtown, it is important to reinforce the pedestrian linkages to and from the lots. Insufficient lighting and threat of vandalism also need to be examined and addressed so that people will feel comfortable using those lots.

Off-Site Parking Provisions

This method allows a site with a surplus of parking spaces to assist another site that cannot meet its requirements. This would allow for more

efficient use of existing parking areas. However, there are several drawbacks, including the following:

a. The Municipality would have an on-going role in administering the required covenants;
b. There may not be any appropriate parking areas within the specified distance that could be used for fulfilling parking requirements; and
c. There may be a change in use so that the property with the surplus parking would require the full use of its parking. Hence, that property would no longer be able to assist another property in fulfilling its parking requirement.

4.2 Parking Management Mechanisms In Other Municipalities

There are additional methods of implementation being carried out in other municipalities to address parking deficiencies. Several widely-used methods are summarized below. Municipalities were found to apply one or more methods, depending on the extent of the parking deficiency and the appropriate remedy.

4.2.1. Cash-in-Lieu

Instead of a monthly parking rental, some municipalities collect a one-time lump sum fee for each parking stall that is short of the total requirements. These fees are placed in a reserve fund to be used for upgrading of existing parking lots and acquisition of properties for new ones. The payment amount differs among municipalities depending on who is made to pay.

In some municipalities, cash-in-lieu payments ranging from $10,000 to $14,000 per stall are paid for strictly by developers instead of individual businesses. Cash-in-lieu is triggered only if there is a development application to build a new building or make an addition to an existing one. Businesses are generally exempt from having to pay the high penalty fees for parking shortfall.

In other municipalities, a lower payment (in the range of $3,500 to $8,000 per stall) is charged to either developers or businesses where there is a parking shortfall. In new development or an addition to an existing building, the developer would pay for each deficient parking stall. If there is a change in business to one that requires more off-street parking than provided, it is the business that pays the fee prior to issuance of business licence.

4.2.2 Development Variance Permit

A Development Variance Permit may be granted by Council to relax parking requirements if they cannot be met on nearby or adjacent lots. In some municipalities, a D.V.P. application to relax parking must be accompanied by an

independent traffic study to demonstrate the potential impact of granting such a reduction.

4.2.3 Shared Parking

The principle of shared parking is to occupy existing parking spaces over as many hours as possible by allowing businesses with different parking patterns to use the same stalls. Businesses that operate at different times of the day may be able to share their parking stalls. For instance, an office that is open only during weekdays may be able to share its parking stalls with a restaurant in the same building that opens during the evening and weekends. This leads to more efficient use of existing parking areas.

4.2.4 Evaluation of Parking Management Mechanisms in other Municipalities

Cash-in-Lieu

While cash-in-lieu is based on the same principle as the parking rental program in Port Coquitlam, the larger one-time fees collected in other municipalities results in faster accumulation of funds for a desired project. For instance, New Westminster charges $11,000 to a developer who provides one less parking stall than is required for a development. In Port Coquitlam, a business that is unable to provide the one extra required parking stall would be charged $350 (the one-time fee) and $90 per year thereafter. The business would have to operate for *118 years* in order for Port Coquitlam to collect $11,000.

Some of the benefits for converting to a one-time lump sum payment program include:

a. The elimination of monthly billing and collection of rental fees; and
b. Capital-intensive projects such the construction of a central parking structure or additional parking lots can be achieved in a shorter period of time.

The higher fees that would be charged, however, may deter some businesses or developers.

Development Variance Permit

The D.V.P. process would allow for Council review and community input and notification of the intent to relax parking requirements. There is, however, no apparent advantage to the City as the shortage of spaces would not be met elsewhere nor would any funds be collected in lieu of parking provision to assist the municipality in land acquisition for parking.

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Shared Parking

Shared parking results in more efficient use of land because less land would be required for parking purposes. However, this method faces the same problems as off-site parking provision. If there is a change in any of the businesses that share the same parking spaces, the "sharing" may not be able to continue. One of the businesses would then find itself unable to meet its parking requirements.

4.3 Comparison of Parking Standards

The parking standards for commercial development in other municipalities were compared to those of Port Coquitlam. Overall, the standards tend to be quite similar between municipalities for most commercial uses. In the comparison, however, higher parking requirements were noted for some uses that generate more traffic and customer volume. Commercial uses such as banks, medical offices, and retail liquor stores have higher parking standards than general commercial uses.

Some municipalities recognize the significance of the Downtown commercial core by having higher parking requirements than in the secondary commercial areas. Some bylaws tie the parking requirements to density of development by requiring a certain number of spaces for the first several thousand square metres of gross floor area and then a higher parking requirement for floor area over and above that base amount.

5.0 PARKING POLICY RECOMMENDATIONS

The analysis in Section 3.0 confirmed that there will not be enough off-street parking to accommodate the type and density of development that is expected in the Downtown. The City has a responsibility to local businesses and residents to help create a vibrant and economically viable Downtown Core. It must, therefore, implement some actions to help increase the supply of parking before the situation is too critical.

The previous section examined the types of mechanisms presently being used in Port Coquitlam and several other municipalities to address the problem of parking shortage. There is no perfect solution to solving the need for more parking. Some of the City's methods such as the parking rental, have certain shortcomings and could be revised to the more common cash-in-lieu system used in other muncipalities. Some of the methods found in other municipalities were deemed to be inappropriate to Port Coquitlam's situation.

The following is a set of proposed policies for Council consideration. The policies confirm the City's commitment to improving the parking situation in the Downtown through direct action and changes to its regulatory mechanisms. The actions that can be implemented to achieve the policies are detailed in the next section of this report.

Policy 1: That the City take a direct role in providing new public parking facilities in the Downtown and making most effective use of existing ones.

This policy option means that the City will take an active part in providing public parking facilities. More surface parking lots could be constructed on vacant municipal lands or existing ones could be expanded, where possible. This would provide an immediate supply of parking spaces.

Other longer-term proactive roles could include purchasing land for parking purposes or undertaking to construct a multi-level parkade somewhere in the Downtown. These are more capital-intensive projects that require collection and/or allocation of funds.

Policy 2: That the City establish a new Parking Reserve Fund to collect funds for the future development of major parking projects.

The City currently collects rent from businesses and landowners who cannot meet the off-street parking requirements. These funds are placed into a reserve fund for the purpose of maintaining and building municipal parking lots. The fees presently collected are low, relative to the fees charged in some other municipalities. Consequently, it will take much longer to collect sufficient funds

to initiate a major project. Revisions to the Parking Reserve Fund could be made to establish a one-time cash-in-lieu payment system to eliminate monthly billing and collection.

Policy 3: ***That the City encourage parking areas in the Downtown to be underground or within a structure.***

Through its policies and regulations, the City can direct parking areas to be located underground or covered within a structure. Such parking arrangements use up less surface area and make more efficient use of the land.

Policy 4: ***That the City facilitate ways to reduce the number of cars taken into the Downtown area.***

Another way of reducing the amount of pressure to find parking is to encourage people to leave their cars at home. The City could identify ways of ensuring that the Downtown is pedestrian-friendly or conducive to other modes of transportation.

Policy 5: ***That the following municipal lots be used solely for public parking in perpetuity:***

1. ***Northeast corner of Donald Street and Wilson Avenue;***
2. ***Southeast corner of Shaughnessy Street and Kingsway Avenue;***
3. ***Northeast corner of Elgin Avenue and Maple Street.***

The above-mentioned sites are presently used for public parking. In order to ensure that these sites are protected from being sold off for development, Council can identify these lots for exclusive parking use in perpetuity. These lots may be considered as potential locations for a parking structure or remain as surface lots.

Policy 6: ***That prior to the sale of any City-owned lands within the Downtown, the lands will be evaluated for their potential as public parking sites.***

In addition to the municipal parking lots and several parks, the City owns several other sites within the Downtown area that will eventually be tendered to the public and developed for commercial use. Prior to the sale of any City-owned lands to a private developer, the City should evaluate them for any potential use as public parking sites. If the lots designated as perpetual parking lots in Policy 5 are not sufficient to meet needs, the City will have to determine if additional City land should be converted to parking lots or explore means of securing public parking in new development through agreements with the developer.

6.0 IMPLEMENTATION OF POLICY RECOMMENDATIONS

In order to implement the policies recommended in the previous section, a number of actions can be taken. This section reviews the various strategies that the City can undertake to implement the policies.

Policy 1: That the City take a direct role in providing new public parking facilities in the Downtown and making most efficient use of existing ones.

1. Pave the remaining portion of the municipal lot on Shaughnessy Street close to the Kingsway Avenue overpass. Several years ago, the City purchased the property at 2670 Shaughnessy Street and demolished the building on the lot. The lot has since remained as gravel-surfaced. This portion of the lot can be paved over and the parking stall lines re-painted.

2. Re-design the parking areas around Leigh Square to accommodate better circulation and maximize parking opportunities.

3. Re-inforce pedestrian linkages between peripheral public parking lots and the Downtown to encourage maximum usage. Such improvements include:
   - Provide more lighting in lanes that connect to public parking areas.
   - Install low-profile landscaping around public parking areas instead of large trees and hedging.
   - Improve condition of lanes that connect to public parking areas to eliminate potholes and drainage problems.
   - Remove glass in parking lots more frequently to improve safety to both cars and pedestrians.

4. Identify parking lots at government buildings as being reserved or time-limited during the weekdays only. During times when these offices are not open, their parking areas should be available for use by the general public.

5. Designate two areas for a future parking structure: the parking lot on Wilson Avenue near Donald Street and the parking lot at the north end of Shaughnessy Street close to the Kingsway Avenue overpass. Funds can be collected accordingly for construction of a structure in the future.

6. Review the Development Management Bylaw to update the parking standards to reflect higher parking requirements for more intensive uses.

Policy 2: ***That the City establish a new Parking Reserve Fund to collect funds for the future development of major parking projects.***

The City can establish a Parking Cash-in Lieu system in which a developer or business pays a one-time fee for each stall that is the difference between the number of stalls required and the number that is provided. This fee is placed into a Parking Reserve Fund for the exclusive use of constructing a multi-level parking structure in the Downtown. The amount of the fee will be determined by the actual cost of developing a parking stall within a parking structure.

Existing businesses that are paying the monthly rental of parking spaces can be given the opportunity to pay a one-time fee with credit on previous payments. Those who choose to continue the monthly payments can do so until the terms of the parking agreements changes (e.g. change in ownership, cessation of a business at a particular location).

When the parking facility has been constructed, those that have paid a fee will have a space assigned for their exclusive use.

Policy 3: ***That the City encourage parking areas in the Downtown to be underground or within a structure.***

1. Amend the commercial zones in the City to include a maximum floor area ratio and a provision for bonussing floor area if underground parking is provided (similar to the provisions in the apartment zones).

2. Develop, in conjunction with the R.C.M.P. Crime Prevention Department, design and development guidelines for underground and enclosed parking. The guidelines are intended to ensure that such parking areas are safe for users. These guidelines would then be adopted as Council policy or incorporated into the O.C.P.

Policy 4: ***That the City facilitate ways to reduce the number of cars taken into the Downtown area.***

1. Provide more amenities and facilities for cyclists (e.g. bike racks, bike lockers).

2. Provide more amenities and facilities for pedestrians. These include:
   - more benches and rest areas in the Downtown.
   - require buildings to provide canopies or other forms of weather protection.
   - wider sidewalks to facilitate outdoor activities and accommodate display areas in front of storefronts.

3. Work with B.C. Transit to improve public transit connections into the Downtown and identify potential Park 'n Ride areas. The City could work with B.C. Transit to identify potential lots outside of the Downtown Core where commuters could park for the day to transfer to a bus instead of taking their cars into the Downtown.

4. Work with commuter rail authorities on a collective Park 'n Ride in the Downtown that would also double as a parking lot or facility to serve the needs of workers or shoppers in the Downtown.

Policy 5: ***That the following municipal lots be used solely for public parking in perpetuity:***

1. ***Northeast corner of Donald Street and Wilson Avenue***
2. ***Southeast corner of Shaughnessy Street and Kingsway Avenue***
3. ***Northeast corner of Elgin Avenue and Maple Street; and***

1. Provide better signage to direct people to the public parking areas.

2. Re-evaluate efficiency of parking lots and re-design, if necessary, to improve circulation and access.

Policy 6: ***That prior to the sale of any City-owned lands within the Downtown, the lands will be evaluated for their potential as public parking sites.***

1. Identify additional City-owned properties that are suitable for surface lots.

2. Determine if there is any potential to negotiate provision of public parking from developers of City-owned sites.

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THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Environmental Protection Committee — DATE: September 14, 1994

FROM: F. K. K. Cheung, P. Eng.
Project Engineer — FILE No: EPC

SUBJECT: **1995 - 1996 PROPOSED ENVIRONMENTAL BUDGET**

RECOMMENDATION:

1. That Committee review and approve the 1995 - 1996 proposed Environmental Budget.

BACKGROUND & COMMENTS:

The Engineering Department is preparing the 1995 - 1996 proposed Engineering Budget, to be submitted at the end of September to City Treasurer. Included in the Budget is the 1995 - 1996 proposed Environmental Budget which includes projects for a grass and leaf depot facility, composting station, recycling station and Fraser Basin cost share. It is recommended that Committee review and approve the 1995 - 1996 proposed Environmental Budget.

F. K. K. Cheung, P. Eng.
Project Engineer

FKKC/
attachment

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NEW ENVIRONMENTAL PROJECTS

09/09/94

Acct. No.	Item	Description	Environmental Capital	DCC Reserve	Provincial Grant	Land Sale Reserve	Special Reserve	Tax Revenue
		ENVIRONMENTAL - 1995 PROJECT						
	1	Grass & Leaf Depot Facility	60,000		20,000			40,000
	2	Composting Station - Phase I	150,000		50,000			100,000
	3	Recycling Station	160,000		53,333			106,667
	4	Fraser Basin Cost Share	2,400					2,400
		TOTAL	***372,400***	***0***	***123,333***	***0***	***0***	***249,067***
		ENVIRONMENTAL - 1996 PROJECT						
	1	Grass & Leaf Depot Facility	35,000		11,667			23,333
	2	Composting Station - Phase II	50,000		16,667			33,333
	3	Fraser Basin Cost Share	2,400		0			2,400
		TOTAL	***87,400***	***0***	***28,333***	***0***	***0***	***59,067***

OTHER ENVIRONMENTAL PROJECTS - 1995

09/09/94

Acct. No.	Item	Description	Environmental Capital	DCC Reserve	Provincial Grant	Land Sale Reserve	Special Reserve	Tax Revenue
	1	Solid Wastes Reduction Program - 2 Bags Limit	15,000		0			15,000
	2	Purchase Composters	120,000		40,000			80,000
	3	Satellite Drop-Off Depots (ie. White Goods, Grass, Leaves and Recyclables)	50,000		16,667			33,333
	4	Recycling of Construction Wastes (eg. Drywalls, Wood, Concrete, etc.)	75,000		25,000			50,000
		TOTAL	*260,000*	*0*	*81,667*	*0*	*0*	*178,333*

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City of Port Coquitlam

1995 Budget — **Program Improvement Request**

Request for Program Improvement

.itle	Garbage cleanup program	Dept :	Environmental Protection

Description of Improvement :

This program will provide residents with a one time opportunity to dispose of their materials (ie white goods, bicycles, chairs, tables, etc)

This will reduce the overall solid wastes and recyclable collection costs. Residents would be requested to put out their materials at curbside one week prior to their collection date. Restrictions on the size of materials would be applied to the regular garbage collection service.

Alternatives :

dvantages of approval :

-provide an alternative for residents to reuse and recycle their recyclable materials.

-reduce overall solid wastes and recycling collection and disposal costs.

-proposed budget for two events, Spring and Fall.

Implications of Denial :

-overall solid wastes and recyclable collection
-cost will continue to increase

Resources required :

Personnel & benefits	$ 15,000
Equipment	$ 15,000
Utilities	$ 0
Materials & supplies	$ 0
Contracted services	$ 30,000
CAPITAL	$ 0
Total	$ 60,000
Revenue generated	$
Other funding	$
Other funding source	

Budget & Administration Committee recommendation:

City of Port Coquitlam

1995 Budget — **Program Improvement Request**

Request for Program Improvement

Title	Dept:
Composting Station - Phase 1	Environmental Protection

Description of Improvement:

This program is the first phase of the composting station construction works. This involves paving one-fourth of a one acre composting station, installing catch basin and sanitary sewer, and constructing a roof cover for the station. This will provide an environmentally safe compositng area for the collected grass and leaves.

Alternatives:

Advantages of approval:

-reduce overall solid wastes collection and disposal costs.

-generate revenue from sale of composted material to Parks and Recreation Department.

Implications of Denial:

-overall solid wastes collection and disposal costs will continue to increase.

Resources required:

Personnel & benefits	$ 0
Equipment	0
Utilities	0
Materials & supplies	$ 150,000
Contracted services	0
CAPITAL	
Total	$ 150,000
Revenue generated	$
Other funding	$
Other funding source	

Budget & Administration Committee recommendation:

SEP 2 8 1994

City of Port Coquitlam

1995 Budget **Program Improvement Request**

Request for Program Improvement

tle Recycling Station -

Dept: Environmental Protection

Description of Improvement:

This program will be set-up in conjunction with the grass and leaf depot facility at the new Works Yard. The facility requires the construction of an access ramp, loc blocks, railings and paving. The facility also needs depot bins, either rental or purchase, for collection of their recyclables thereby, reducing the operational costs.

Items to recycle: white goods, metals, batteries and exisiting recyclables.

Alternatives:

Ivantages of approval:

-encourage residents to recycle their recyclables.

-reduce overall solid waste collection and disposal costs.

Implications of Denial:

-overall solid waste collection and disposal costs will continue to increase.

Resources required:

Personnel & benefits	$ 40,000
Equipment	$ 20,000
Utilities	$ 0
Materials & supplies	$ 75,000
Contracted services	$ 25,000
CAPITAL	$ 0
Total	$ 160,000
Revenue generated	$
Other funding	$
Other funding source	

Budget & Administration Committee recommendation:

BHP Minerals Canada Ltd.
Island Copper Mine
P.O. Box 370
Port Hardy, B.C. Canada V0N 2P0
Telephone (604) 949-6326
Facsimile (604) 949-6060

BHP Minerals

Enclosed please find:

1. A copy of the first report of the North Island Round Table - BHP Landfill Proposal.

2. A copy of an extract from Volume 2 of the Greater Vancouver Solid Waste Management Plan: Additional Studies Out-of-Region Disposal. This extract describes the BHP landfill proposal as of the date of publication.

For further information, please contact:

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North Island Report of the Round Table

on issues and concerns about the BHP Landfill Proposal

June, 1994

Introduction

In February 1993, BHP Minerals Canada Ltd. issued a document proposing that their open pit mine on the north shore of Rupert Inlet near Port Hardy be converted for use as a landfill for municipal solid waste when the mine closes in 1995. The open pit is 2.4 kilometers long by 1.2 kilometers wide and 400 meters deep (the bottom of the pit is 390 meters below sea level). The pit is large enough to accommodate British Columbia's current annual municipal solid waste production for about 150 years. BHP proposes to collect methane gas from the landfill. Methane could be produced in sufficient quantity to serve the energy requirements of industries or settlements.

The proposed project would require the construction of a transfer station and container terminal at the mouth of the Fraser River, a container terminal on the North Island, container vessels to transport the waste to the North Island, trucks to transport the waste across the North Island, and numerous facilities at the mine site itself. BHP estimates that capital costs will be about $75 million and that about 100 direct jobs would be created on the North Island.

During the months of February, March and April 1993, BHP conducted a series of community meetings during which they presented their proposal and answered questions. These meetings included briefings for local politicians, First Nations, the media, interest groups, and public meetings in Sointula, Port Hardy, Port McNeill, Alert Bay, Quatsino, Coal Harbour and Port Alice.

BHP presented its proposal as a way of turning an abandoned mine into a community asset. They stated that a well engineered landfill could replace dozens of substandard landfills up and down the coast and this would result in a net environmental benefit. BHP believes their open pit can be developed for municipal solid waste disposal without causing pollution of air or water and that it would provide a steady base of employment for residents of the area.

After the community meetings it became apparent that there was not a consensus in the North Island communities as to the benefits of BHP's proposal. Opinions ranged from enthusiasm to outright opposition to the proposal. The media reported these different views and the BHP proposal became the subject of public controversy. In particular, the Quatsino Task Force was organized by residents of Quatsino to mobilize public opinion against

Island Copper Mine

The North Island Round Table requests:

Public Review and Comments

This document is the draft report of the North Island Round Table established to identify environmental, economic and social issues related to the BHP Landfill Proposal which are of interest or concern to North Island residents.

Residents are asked to submit their comments in writing by September 15, 1994. All comments will be reviewed by the Round Table prior to completion of the final version of the report. Please mail or fax to:

Mr. Patrick Moore, Facilitator, North Island Round Table, 101 – 1198 West Pender Street, Vancouver, B.C. V6E 2R9 Telephone: 689-7500 Facsimile: 669-0028

In addition to this publication, the following material will be available for review on the premises at the locations listed below:

Round Table Report: June 1994, Memorandum of Understanding, Round Table Minutes, Project Prospectus – April, 1993, Major Project Review Process, B.C. Landfill Criteria, Island Copper Mine - 1992 Environmental Assessment Report, Design of Rock and/or Soil Slopes (B. Findlay), Water quality monitoring of Quatsino Sound (I. Horne), Mine closure plan (I. Horne), Review of likely consequences following a large earthquake (A.M. Robertson), Southwall Pushback Project (R.B. Robertson, B. Findlay, K. O'Kane), Summary of GVRD Strategic Recommendations, Scope of Work (Emcon), Leachate Treatment Studies (B.C. Research), Tourism Impacts - Preliminary Assessment (C. Aspinall), Press clipping file.

INFORMATION CENTRES:

Public Libraries
- Port Hardy
- Port McNeill
- Port Alice
- Alert Bay
- Holberg
- Sointula

Post Offices:
- Coal Harbour
- Winter Harbour

Quatsino Task Force
Gwen Hansen
Tel: 949-7960

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The North Island Round Table

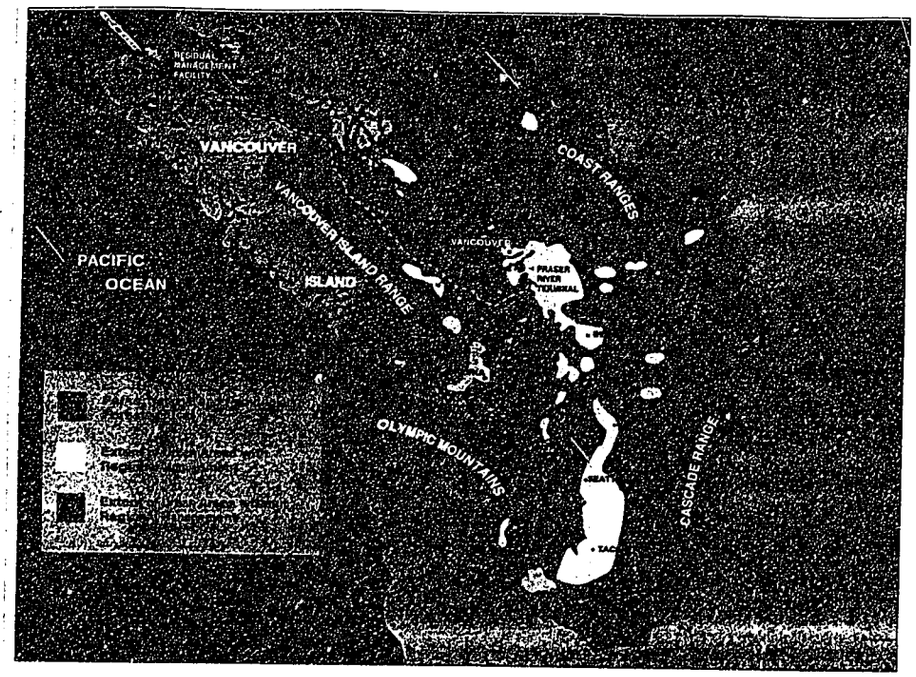
In August 1993, BHP approached the elected Directors of the Mount Waddington Regional District with a proposal to establish a local advisory committee composed of the various interests, sectors and communities on the North Island. BHP proposed to fund the advisory process to determine the environmental, economic and social concerns of local residents. They proposed that the Regional District Board choose the members of the advisory committee and determine the terms of reference for the committee. In this way it would be clear that although BHP was providing the funding they had no control over who was appointed to the committee or the topics to be discussed.

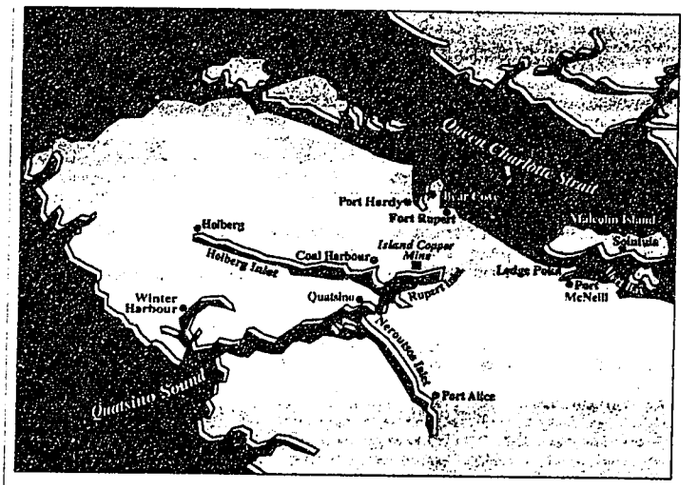
In [illegible] 1993, BHP and [illegible]. Waddington Regional District signed a Memorandum of Understanding to establish a local advisory committee. It was agreed there would be no expenditure of taxpayer funds and BHP would pay for the process. The committee would be composed of 15 volunteer members representing a broad range of interests and opinions. Meetings would be open to the public and the media. A professional facilitator was engaged. It was agreed meetings would take place monthly and the committee would determine its own agenda and procedure.

The first meeting of the committee took place in Port Hardy on October 8, 1993. At that meeting the members agreed the committee would operate by a consensus process similar to the B.C. Round Table on the Environment and Economy. It was agreed the first order of business was to develop a list of issues for consideration by the committee.

During the second meeting on October 29-30, 1993, the members agreed the committee should be named "The North Island Round Table". A list of 15 issues (since expanded to 16) was arrived at after considerable discussion. It was agreed this list covered the significant environmental, economic and social aspects of the BHP proposal.

The Round Table agreed on a work plan that would focus initially on information gathering in order to gain a better understanding of the technical issues surrounding the proposal. In October 1993, the members of the Round Table were conducted on a tour of the mine site. The November 1993 and January 1994 meetings were largely devoted to presentations by experts in geology, water quality, pollution, landfill design, and methane gas utilization. The primary focus of discussion was on the two most complex technical issues, the physical integrity of the open pit and water quality and management.





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In February 1994 members of the Round Table went on a field trip to visit landfill sites in Washington State and the Lower Mainland. The purpose of the field trip was to familiarize members with landfill design and management, to contrast substandard sites with well-run sites, to visit waste transfer stations and recycling centers, and to observe various ways in which landfill methane is incinerated or used for industrial purposes. The group also visited B.C. Research where scientists retained by BHP were conducting toxicity tests on various landfill leachates and investigating leachate treatment options.

During the March, April, and May meetings the Round Table discussed the 16 issues in light of the information they gathered during presentations and field trips. The concerns raised during these discussions are the main theme of this report.

The Role of the North Island Round Table

It was agreed early in the process that the North Island Round Table is only one part of a larger process that will judge the merits of the BHP proposal. The North Island Round Table has no authority to approve or disapprove the project or to require amendments to it. It was agreed the role of the Round Table is to identify and articulate local concerns and to make those concerns known to the public, BHP, and all levels of government.

It was also agreed the Round Table does not have the resources or the expertise to give a final opinion on many of the complex technical and social aspects of the proposal. These issues will be addressed if the project advances to the stage of a full feasibility study paid for by BHP. In addition, it is the Round Table's understanding that if BHP does decide to go ahead with the project there will be a formal federal-provincial Major Project Review Process or its equivalent. This was confirmed in a letter of July 5, 1993, to M. C. Halvorsen of Quatsino from Anne Edwards, Minister of Energy, Mines and Petroleum Resources and John Cashore, then Minister of Environment, Lands and Parks.

Alex Birkenhead (l) explains B.C. Research leachate tests

The role of the North Island Round Table in the process of reviewing the BHP proposal can be summed up as follows:

- To bring together representatives of various interests on the North Island to discuss the implications of the BHP proposal.
- To identify issues related to the proposal and to state the concerns of the Round Table members.
- To gather information about the proposal and about related issues such as recycling, landfill design, air and water pollution, fisheries, tourism, job creation, etc.
- To determine where there is agreement and where there are differences of opinion, priority, or perspective among members of the Round Table.
- To provide a document that sums up the concerns of the Round Table members so BHP, the public and the government agencies that judge the proposal have a clear, detailed expression of local concerns.

Issues Discussed and the Concerns of the Round Table Members

The Round Table members had many hours of discussion during which there was an opportunity to raise any and all issues related to the proposal. The Round Table operates by consensus so there are no votes, only indications of agreement or where there is not agreement, discussion until the nature of the disagreement is clear.

The members of the Round Table realize there may be other issues and concerns than those expressed in this report. They invite public comment on the issues raised in the report and any other subjects that may be of interest to the members. New information or concerns will be incorporated into a revised edition of this report.

The Round Table did not attempt to reach consensus on whether or not the BHP project should go ahead. Firstly, there is not yet enough information to make a definitive judgment; secondly, the Round Table is not authorized to make this decision. While it is fair to say there is a range of opinions on the merits or demerits of the proposal, there are two distinct views:

1. Those who are opposed to the proposal and who require a greater degree of assurance than they now enjoy, particularly about environmental concerns.

2. Those who would approve of the project, provided it is possible to demonstrate that it would not cause unacceptable environmental damage.

While these two points of view sometimes seem poles apart it is important to recognize they share similar concerns. Everyone agrees the environment must not be damaged by the project and that there are significant environmental concerns. Everyone agrees the social and economic well-being of North Island residents is important and must be central to any decision on the proposal.

The subject of "trust" was common to many discussions. Some members are more comfortable than others in trusting companies and governments to keep the public interest in mind. Some members are distrustful of the motives of the private sector while others believe the private sector often serves the public interest better than government-run enterprise. Some members think there is not enough government regulation to control private interests while others believe there is already too much government regulation. These differences certainly cannot be resolved by a small committee on northern Vancouver Island.

With these general points in mind the following are the issues and concerns raised during the discussions of the North Island Round Table.

1. Alternatives

The members of the Round Table are aware of only two existing alternative proposals for the open pit when the mine ceases operation in 1995. The first is the plan to flood the open pit with seawater capped with fresh water to make a lake. The second is to use the pit for a landfill to dispose of municipal solid waste.

There are no presently known economic benefits from flooding the pit with water. There are no serious environmental concerns raised by this option.

There would be significant economic activity generated by a municipal waste landfill operation in the open pit. There are a number of significant environmental concerns associated with this option.

BHP decides not to go ahead with the landfill proposal or if government decides against the proposal, then the pit will be flooded and turned into a lake.

2. *Ownership and Jurisdiction*

As presently proposed the landfill operation would be owned by BHP as a private business subject to government regulation.

The Round Table recognizes the government-to-government negotiations underway through the Treaty Commission may result in transfer of ownership and jurisdiction over some lands to the First Nations.

BHP has an obligation under provincial legislation to reclaim the mine site and to ensure there is no pollution caused from water draining through the mine site. This responsibility has no time limit and will be enforced by the posting of a bond that is sufficient to cover any foreseeable environmental impacts after the mine is closed. BHP cannot pass this responsibility on to another party unless directed to do so by government.

If BHP were to sell all or part of its interest in a landfill operation it will retain its obligation to control pollution caused by the mine site. The mine and the proposed landfill would be separate operations and fall under separate sets of jurisdictions and regulations. Some members of the Round Table are concerned that it will be difficult to determine whether some future environmental impact is due to the legacy of the mine or to the landfill operation. All members agreed this concern should be resolved before any approvals are given for the landfill.

When the Island Copper Mine was established in the early 1970's the area occupied by the mill and other buildings was added to the Municipality of Port Hardy in order to provide a property tax base for the community. The open pit was not included in this area and is part of Area C of the Regional District of Mount Waddington. All the area occupied by the mine is Crown Land presently held under mineral lease by BHP.

All members agreed that if the landfill operation goes ahead it will be necessary to resolve the issue of local jurisdiction on the site. At issue is whether the landfill operation (and any other industries established on the site) would be under the jurisdiction of Port Hardy or of the Regional District of Mount Waddington.

3. *Government Regulation.*

There was considerable discussion on the subject of where this proposal fits in the system of government regulation. It was agreed this proposal is somewhat unique and involves municipal, regional, provincial and federal interests. These include government agencies involved in land use, mining, waste management, environment, fisheries, energy, and transportation.

It was agreed local interests must be represented on any federal-provincial review of the project and that the Regional District government must play a continuing role in any landfill development at the site.

There is concern about how the landfill proposal fits into the Regional District's waste management planning process. Would the landfill be part of the Regional District of Mount Waddington's waste management plan? How would the project fit into the plans of other Regional Districts that were sending their waste to the landfill?

Some members were concerned it would be difficult to regulate the landfill project because it is a private business rather than a publicly run operation. Other members felt it would be preferable to have a private business regulated by government as this would avoid any conflict of interest caused by government regulating itself.

All members agreed there must be an approved closure plan in place before the project proceeds. The closure plan must contain provisions for premature closing of the landfill in the event of unforeseen circumstances. The intent of this requirement is to make certain the residents of the North Island are not left with an economic or environmental liability after closure of the landfill.

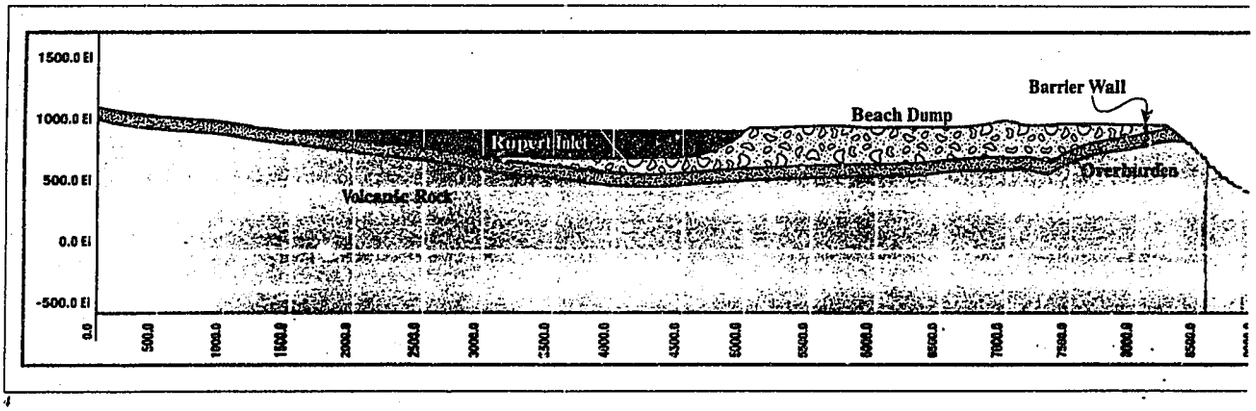
4. *Regulation of Quality Control of Incoming Waste*

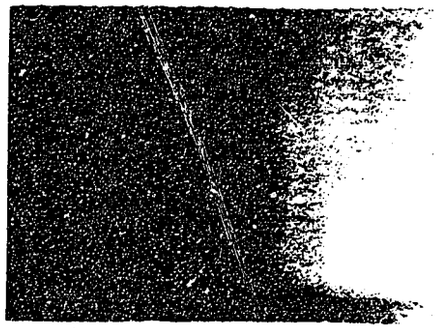
All members are concerned about the possibility of hazardous or toxic waste either accidentally or intentionally entering the landfill. Some members were particularly concerned about regulating waste originating outside British Columbia. All members agreed that regulations and inspection procedures must be required that guarantee no toxic or hazardous waste comes to the North Island. This could include inspections where the waste was loaded into containers for shipment as well as inspection at the site during landfilling operations.

All members agreed that any revision to the type of waste allowed under a landfill permit must be subject to full public review.

5. *The Impact of the Project on the "3 Rs".*

The provincial government has set a target to reduce municipal waste by 50% by the year 2000. Some members are concerned that the availability of such a large landfill will reduce efforts to reduce, reuse and recycle municipal solid waste. They are concerned that the BHP project might be used as an excuse to relax the 50% target on the basis of costs to the taxpayer. Other members felt that society's resolve to become more efficient by adopting the 3 Rs would not be reduced by the landfill project.





BHP believes, and some members agree, that the scale of the landfill operation will make it more economical to conduct recycling programs than the current system by providing a means of transportation to markets.

It was agreed that the cost of waste disposal may be a factor in determining the project's impact on the 3 Rs. Some members felt that lowering current disposal costs could result in reduced efforts to implement the 3 Rs. Other members felt that savings generated by lower landfill costs could be diverted to recycling programs.

BHP believes they should be permitted to offer landfilling services at the lowest cost possible to achieve an economically viable operation.

The Round Table discussed the issue of whether the adoption of 3 Rs programs should be based primarily on economic reasoning or that they should be pursued aggressively because they are "good in their own right". This discussion is a complex one that involves consideration of environmental and social costs that are difficult to measure and are not included in the usual economic calculations. All members agree that the 3 Rs should be supported by regulation and that the BHP project should be designed to encourage recycling programs and to provide the public with information and resources to support these programs.

Round Table members at Hidden Valley Landfill in Washington State

6. Trade and Transportation of Municipal Waste.

The Round Table considered the question, "Should municipal waste be treated differently from other commodities regarding trade and transportation?" This question is relevant because some jurisdictions and interest groups have adopted policies to restrict transport of waste across jurisdictional boundaries. Most members agreed that in principle there should be no difference between municipal waste and other commodities regarding regulation of trade and transportation. It was recognized that many commodities in trade, such as industrial chemicals, are much more hazardous than municipal waste. All members felt that the main issue is to ensure that the municipal waste is not contaminated with toxic or hazardous materials.

7. The Physical Integrity of the Open Pit.

The Round Table heard a number of presentations from experts on the physical integrity of the open pit. It was agreed that the rock walls of the pit are stable and that there is little likelihood of fractures developing in the rock that could allow leachate to escape. The members are particularly concerned about the concrete "slurry wall" on the south side of the pit towards the sea. The slurry wall was built to keep water out of the pit so that ore from the south wall of the pit could be extracted. Maintenance of the integrity of the slurry wall would be necessary if a landfill were to proceed.

The members agreed that in the worst case scenario an earthquake could cause a major rupture of the slurry wall and flooding of the pit with seawater at such a rate that the landfill project would have to be abandoned. The waste in the landfill would remain in place except for the possibility of buoyant items not yet covered with earth floating to the surface. No solid waste could escape from the pit into Rupert Inlet due to the large expanse of waste rock that was placed between the pit and the inlet.

Most committee members agreed if there was an earthquake of such a magnitude there would be much more serious damage caused than the flooding of the landfill with seawater.

The members agreed there was virtually no possibility of a tidal wave reaching the mine site due to the constriction of Quatsino Narrows.

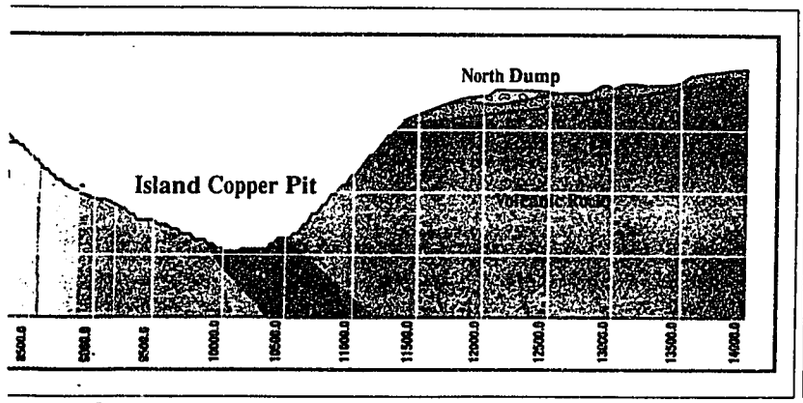
8. Water Quality and Management.

BHP believes, based on existing technology and experience, that landfill leachate and acid rock drainage can be successfully treated in a leachate treatment plant. Such treatment would be needed to remove heavy metals and ammonia to levels that are non-toxic to fish and meet environmental standards.

All Round Table members are concerned about issues of water quality and water management in relation to the landfill proposal. This is particularly true for water that leaches through the waste and must be pumped to the surface, treated and discharged to the sea.

There is also a concern for the continuing discharge of water that becomes acidified as it drains through the waste rock from the mine. The combination of landfill leachate and acid rock drainage must be thoroughly addressed in any environmental review of the project.

The primary concern for water quality is the impact on the marine environment, particularly on fish and shell-



fish. There are commercial fishing operations in Rupert Inlet and the Marble River has the largest run of Chinook salmon in Quatsino Sound. There is a commercial salmon farm about ten kilometers from the mine site. Rupert Inlet and Holberg Inlet have the potential to support additional aquaculture operations.

Some members are concerned that the long time scale of the project (150 - 500 years) makes it difficult to predict the long-term impacts of the project on water quality.

9. Methane Generation and Use.

All landfills generate methane gas. The methane is created by anaerobic bacteria that digest the organic portion of the waste. Water helps to speed up the reaction so a landfill on the North Island would be effective at producing methane.

Landfill operators are now often required to collect methane produced as it is flammable and is also a powerful greenhouse gas. After collection methane is either incinerated or burned for energy production.

BHP estimates the proposed landfill will generate the equivalent of 30 to 40 megawatts of methane energy. This is a significant amount of energy in relation to the needs of the North Island. Port Hardy consumes about 10 megawatts of electrical energy at present. The methane could be used to produce electricity at the site, part of which would be used to run the pumps and other equipment and part of which could be sold off the site. It would be possible to build a pipeline from the site to Coal Harbour, New Quatsino Village, or Port Hardy to make use of methane for heating.

All members agreed that emissions from incineration or burning of methane must meet air quality requirements and must use the best available control technology (BACT).

10. Employment and the Economy.

BHP estimates that 100 direct jobs, 60 at the site and 40 in trucking and transport, would be created on the North Island by the landfill project, based on a design capacity of 2000 tonnes per day. Other jobs would be created at the southern shipping terminal, at transfer stations, and on vessels carrying the waste.

The Round Table did not attempt detailed calculations of the indirect job creation from the project but the members agree that the ratio could be similar to the present mining operation. In other words the landfill project could replace about one-fifth of the present direct and indirect jobs generated by the mine.

11. Spin-off Economic Impact – Positive and Negative.

BHP believes the landfill project could be the "core" project that would attract other industries to the site. Recycling industries for commodities such as newspaper and steel may become established on the site. Methane from the landfill could provide the energy requirements of these and other industries.

Some members believe that a container terminal on the North Island would attract other freight such as seafood, specialty pulp, wood products, and recyclable materials. The container ships would be returning empty so there may be a possibility of "back-hauling" other commodities.

Some members are concerned that the landfill project might harm other industries, particularly tourism and fishing. For tourism the key concern is the perception that the existence of a large landfill might deter people from visiting the North Island. For fishing the concern is for the quality of water discharged from the landfill into the sea.

In order to gather information on the impact of landfills on tourism BHP conducted a preliminary review of the situation at Cache Creek. The Cache Creek landfill opened in 1989 and receives municipal waste from the Greater Vancouver Regional District. It can actually be seen from the highway passing through town.

BHP conducted interviews with the mayor and two former mayors of Cache Creek and with the President of the Cache Creek Chamber of Commerce. They all agreed that the landfill had created valuable jobs, had provided badly needed funds from property taxes and royalties, and had no negative environmental impacts related to tourism.

All members of the Round Table agreed that any federal-provincial review of the proposal should require detailed examination of any possible negative economic impacts of the project.

12. Transportation Routes and Facilities.

The BHP proposal involves the construction of a container terminal for transfer and loading of municipal waste at the mouth of the Fraser River. Containers would be loaded onto barges or ships for transport to the North Island. Containers could also be picked up at communities between Vancouver and the North Island.

BHP initially proposed two options for the shipping route from Vancouver. All Round Table members agreed that if waste is to be shipped to the North Island it should come up the inside passage and not up the west coast and through Quatsino Narrows.

It would be necessary to build a container terminal on the North Island and to transfer the waste containers by truck from the east coast to the landfill site on Rupert Inlet. BHP is studying a number of potential locations for the shipping terminal.

Some members are concerned that additional ship traffic up the inside passage might cause problems for fishers and recreational boaters. Other members felt the additional ship traffic (about one ship every 30 hours) would not make a significant difference.

All members agreed that it would be preferable if the trucking route across the North Island were not on the main paved highway.

13. Social Impacts

The Round Table discussed a number of issues related to social impacts, in particular the fact that these impacts would not be distributed equally among the population. For example, if the trucking of waste created a safety risk, traffic congestion problems or excessive noise, these impacts would affect some people more than others.
The members of the Round Table agreed that any federal-provincial review of the project must include a thorough study of social impacts. There should be particular reference to the distribution of those impacts among the residents of the North Island.

14. Perception and Psychology.

Some members of the Round Table are concerned that the public image of the North Island will be diminished if there is a major landfill located at the mine site and that this may cause a reduction in tourism. Other members point to the fact that most major population centers have landfills in their vicinity and in the somewhat comparable case of the Cache Creek landfill there has been no perceived impact on tourism.

Some members are concerned the project would affect the way residents of the North Island perceive themselves and that it would impact the identity of the North Island in a negative fashion. Other members believe if the project is a benefit to society and sets a good example for others it should result in a positive impact on the identity of the North Island.

15. Fair Access to Information.

The members of the Round Table agreed that they had been given fair access to information on the BHP proposal. The Round

Table gives them an opportunity to participate in a process that is fair and informed and in which they can raise their concerns. The Round Table agreed early in its work that any issue that had already been discussed could be brought up again at any time, especially if there was new information on the subject. It was also agreed that new issues could be introduced at any time. The agenda remains open so long as the Round Table continues to work.

All members are concerned with the need to provide the general public with better access to information about BHP's proposal and about the Round Table's work. It was agreed that this report will be widely distributed on the North Island and that there will be a period of time during which public comment will be received. The Round Table will consider revising the report on the basis of information and concerns raised during this period.

16. Where Does the Round Table Process Lead?

All members agreed that the Round Table's work must be taken into consideration by BHP and by government agencies involved in reviewing the project. The concerns raised by members of the Round Table must be taken seriously by the federal and provincial governments and should be fully addressed in any federal-provincial review.

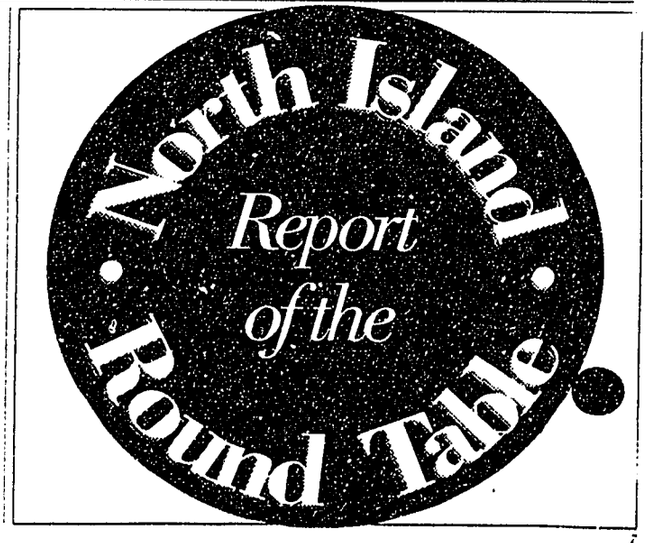
It is the understanding of the Round Table that the provincial government will require a Major Project Review of the proposal that would include study of environmental, economic and social impacts of the project. All members of the Round Table support this requirement.

If BHP decides to proceed with the project the next major step would be a project report as required by Stage 1 of the Major Project Review Process. The project report will give a detailed assessment of the environmental impacts as well as specifications for costs and engineering. BHP has agreed that the project report will address all the issues and concerns raised by members of the Round Table.

North Island Round Table Membership

Patrick Moore, Facilitator 689-7500 Vancouver
Maria MacDonald, Secretary

Member	Organization, community or sector	Telephone
Michael Berry	Alert Bay Council; Fisheries sector	974-5855
Gerry Calder	Quatsino Band; First Nations interests	949-6245
Elizabeth Frost	Winter Harbour Ratepayers Association	288-3313
Donna Gross	Sointula residents; Fisheries sector	973-2029
Gwen Hansen	Quatsino First Nation	949-7960
Scott Harris	Regional planner, Regional District Council	949-9433
Brian Kay	Quadra Island; Tourism sector	949-6911
Jon Matheson	Regional Economic Development Commission	956-[illegible]
Kerry McGourlick	Port McNeill, Forestry sector	956-4116
Dave McKinnon	Port Alice, North Island Sportsmens Association	284-6201
Stan McLennan	Port Hardy Council; Mt. Waddington Regional District	949-7189
Rick Milligan	Port Hardy Economic Development Committee	949-6548
Sophie Moore	Port Hardy Recycling Society	949-7001
Norm Prince	Coal Harbour; Mt. Waddington Region Solid Waste Management Committee	949-7443
Dick Robertson	BHP Minerals Canada Ltd. – Project Proponent	949-6326



Vancouver Island Round Table

BC's Environmental Assessment Process: How does it work?

There are three possible stages in the environmental assessment process: application, project report review and a Board hearing. Most projects will go through the first two stages. The timelines are specified in a draft regulation.

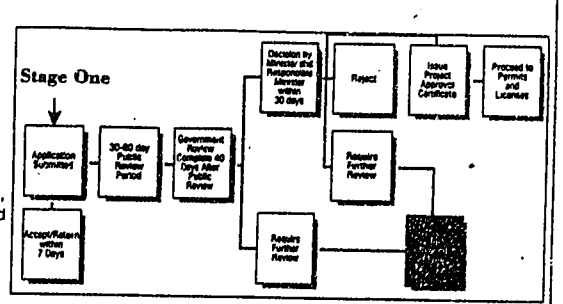
Stage 1: Application

The first step is for the proponent to submit an application for a project approval certificate to the Executive Director of the Environmental Assessment Office. The Executive Director will screen the application to ensure it is complete and acceptable for review. An application fee will be charged for an accepted application. If the application is accepted, the Executive Director establishes a Project Committee. The application is placed on the Project Registry within 7 days. The public has a specified time period (30-60 days) to comment on the application.

The Project Committee reviews the application and considers comments from the public and other interested agencies. Based on this review, the Project Committee either recommends to the two Ministers that the project be approved or rejected, or requests a detailed project report from the proponent.

If the Project Committee recommends referral to the Ministers at this stage, this recommendation is forwarded to the Minister of Environment, Lands and Parks and the Responsible Minister who have a maximum of 30 days to make a decision and give written reasons for their decision.

The application review will take a total of 4-6.5 months for a project proceeding to further review, depending on the complexity of the project. It is possible for relatively straight-forward projects to be approved at the end of the application phase (within 3-5 months). Most projects, however, will likely proceed to the project report phase.



Stage 2: The Project Report and Review

Report Preparation

If a project report is requested, draft specifications are developed by the Project Committee. Those specifications are placed in the Project Registry and referred to the proponent, other government agencies and First Nations and made available for public comment for a period of 15-30 days. The draft specifications are then finalized, filed on the Project Registry and provided to the proponent.

The amount of time taken for the proponent to complete the project report will depend on such factors as the availability of relevant information, complexity of the project, and degree of urgency of the proponent. The preparation of a thorough and comprehensive project report can take the proponent from 3-18 months.

Project Report Review

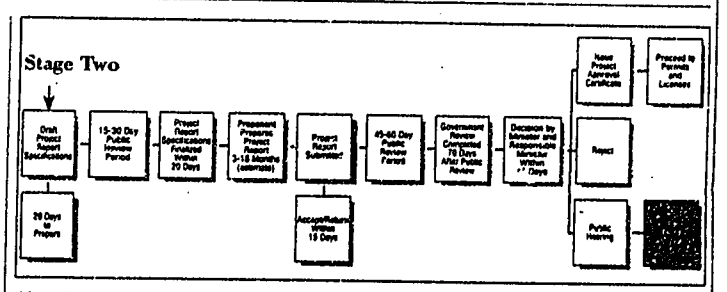
With the Project Committee, the Executive Director reviews the report to determine whether it has met the project report specifications. If it is accepted for review, it is filed on the Project Registry. The public and other agencies have up to 60 days to submit comments to be considered by the Project Committee. The Project Committee analyzes the project report, considering the comments received. Based on this evaluation, the Project Committee makes a recommendation to the Ministers whether a project approval certificate should be issued. The project report review is to be completed within 70 days.

The Ministers review the application and recommendations, and either issue or refuse to issue a project approval certificate. At this stage, the Ministers may decide to send the project for a public review by the Environmental Assessment Board.

The Ministers must make a decision within 45 days and give written reasons for their decision which are placed on the Project Registry.

Permits and licenses, considered concurrently with the review, may be issued with the project approval certificate or shortly thereafter.

The total time for a normal two stage review, including application and report preparation by the proponent, will be approximately 12-30 months.

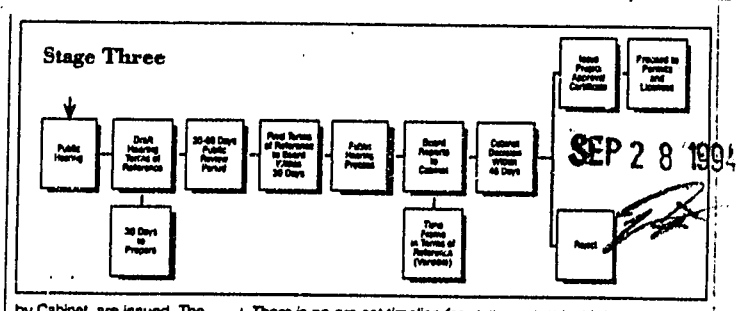


Stage 3: Environmental Assessment Board Hearings

If the Ministers require a public hearing, they issue the draft terms of reference, which would specify the issues to be addressed and may include a requirement that specific permits and licenses be considered at the hearing. The draft terms of reference are sent to the applicant and the Board, and are filed on the Project Registry for public review. Comments are invited on the draft terms of reference. Terms of reference are then finalized by the Ministers.

The time frame for the hearing process may also be set at this time. Following the hearing, the Board submits its report and recommendations to Cabinet. Cabinet then decides within 45 days, whether to issue or refuse to issue a project approval certificate. Cabinet's reasons for decision and order of the Cabinet are filed on the Project Registry. The project approval certificate and any associated permits, if ordered by Cabinet, are issued. The project is now authorized to proceed.

There is no pre-set timeline for the public hearing process. It is roughly estimated that a project which must proceed through this third stage of a review could take 18-42 months in total to complete all three stages.

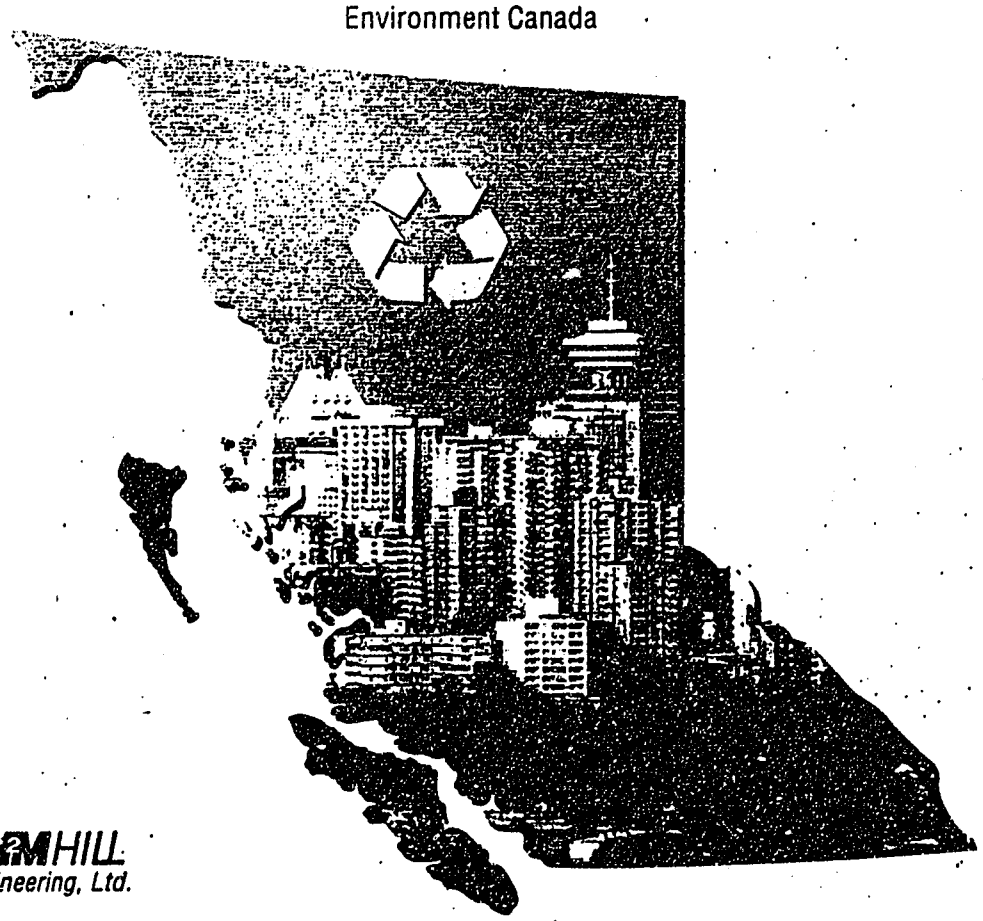


GVRD Solid Waste Management Plan – Stage 2

Comprehensive Waste Management Strategy

Supporting Documentation–
Volume II. Additional Studies
Out-of-Region Disposal

Greater Vancouver Regional District
BC Ministry of Environment, Lands and Parks
Environment Canada



CH2M HILL
Engineering, Ltd.

in association with
Concord Environmental

April 1994

Contents

Section 1
Introduction

Background

Four unsolicited proposals for out-of-region disposal of the GVRD's residual solid wastes have been submitted to the GVRD to date. Figure 1-1 shows the locations of the proposed out-of-region landfill sites and the transportation corridors accessing each site. The technical evaluations of solid waste options in Stage 2 of the GVRD Solid Waste Management Plan Review (SWMPR) considers out-of-region disposal as a possible long-term option. If Stage 2 should indicate a need for and recommend a new or expanded landfill outside the GVRD Plan area, a call for proposals for landfill sites may be issued.

Objectives

The purpose of this report is to identify and document unsolicited proposals for out-of-region disposal of residual wastes received by the GVRD. The documentation of the proposals includes an assessment of the environmental suitability of each site.

Methodology

Telephone interviews were conducted with each proponent to ask follow-up questions and request additional written information with respect to their proposal. Each proposal is documented on the basis of the proposals received, the results of the telephone interviews, supplementary documentation provided by proponents, and other information gathered for the purpose of the Stage 2 evaluations. The major topics addressed for each site include the following:

- Project description
- Proponent
- Disposal site
- Transfer and transportation
- Environmental suitability

The environmental suitability of each project is based on an assessment of the following issues:

- Air impacts

- Water impacts
- Local acceptability
- Other environmental considerations (e.g., terrestrial resources, land use, cultural and historic resources)

The assessment of each facility also includes opinions regarding the likely ability of each landfill to conform with the BC Landfill Criteria, or other applicable regulations or requirements.

The assessment of environmental suitability is based on the same base of information described above. As such, opinions regarding environmental suitability and local community acceptance are general in nature. Definitive conclusions would require considerable evaluation of specific proposals with detailed site investigations.

In reviewing the proposals, the level of detail submitted by organization varied. Accordingly, a proposal discussed in a high level of detail should not be construed as preferable to one discussed in less detail. Consistent with the terms of reference for this study, the degree to which we have been able to cross check vendor-supplied information is limited. None of the sites were visited by CH2M HILL project team personnel for the purposes of this report.

References of documents reviewed for this analysis are included in Appendix A, and a list of contacts made during this study is provided in Appendix B.

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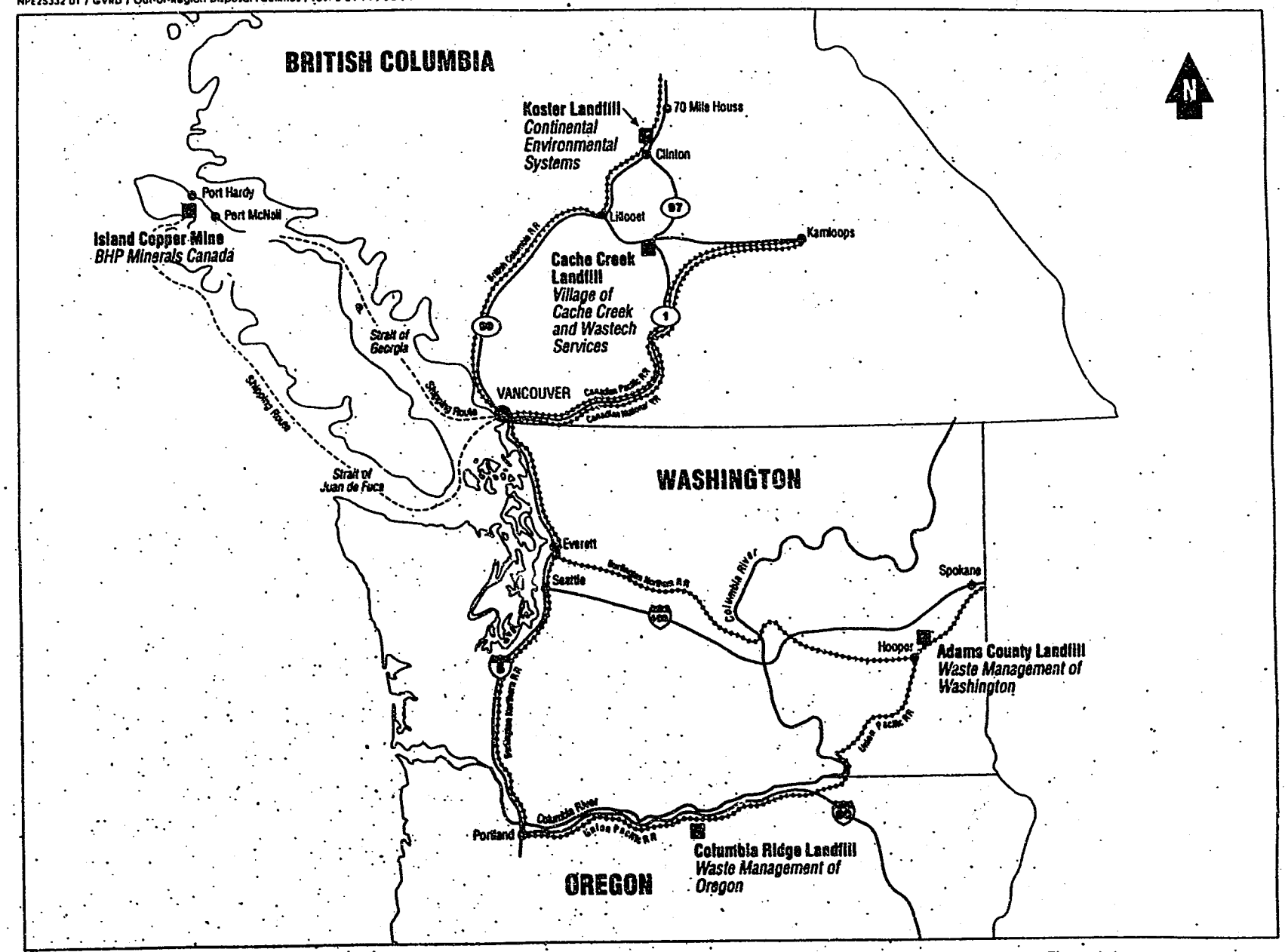


Figure 1-1
Location of Out-of-Region Disposal Facilities

Section 2
BHP Minerals Canada, Ltd.

Project Description

BHP Minerals Canada, Ltd. (BHP), has been researching alternative closure plans for its Island Copper Mine on northern Vancouver Island, which is scheduled to close in 1996 with depletion of the ore body after 25 years of operation. The company proposes to determine the feasibility of using the open pit as a municipal solid waste landfill. A feasibility study will identify potential sources and volumes of waste from the Georgia Strait Basin, including Greater Vancouver and the Puget Sound region in Washington State.

In order to be viable, the landfill operation will require a substantial volume of the solid waste produced in the GVRD (approximately 625,000 tonnes per year minimum). According to BHP representatives, several regional districts and at least one Washington county have expressed interest in using the system, but these jurisdictions are generally waiting for further developments prior to making any firm commitments. The feasibility of accepting less than the 625,000 tonnes per year has not been studied in detail, but may be part of the pending feasibility study.

BHP plans to apply for a landfill permit from the Ministry of Environment, Lands, and Parks (MOELP) after conducting a feasibility study for the project. The feasibility study would be conducted after expressions of sufficient interest in the proposal by potential customers. BHP intends to be included in the Solid Waste Management Plans of regional districts associated with the proposed landfill prior to applying for a Waste Management Permit. The timing to commence application is currently dependent on solid waste management planning in the province, but BHP hopes to begin the application process in early 1994.

Mining operations in the pit will terminate in early 1995 and milling of stockpiles will continue until the end of 1995. BHP estimates the landfill could be operational in less than 2 years from date of project and award. The greatest unknown is the time necessary for permitting and approvals. Site preparation will require as little as 6 months, with a somewhat longer lead time for acquiring a container vessel(s).

At this time, the proponents anticipate that waste would be loaded into standard shipping containers at existing transfer stations and trucked to an ocean shipping terminal. At the terminal, waste would be loaded onto ships and transported by barge or roll-on/roll-off vessel through the Strait of Juan de Fuca or the Strait of Georgia to northern Vancouver

Island. Future studies will include emergency planning and safety regulations proposed by the Canadian Coast Guard, along with all the socio-economic and technical studies necessary for securing permits.

All project financing will be provided by BHP, and the operation will be self-supporting. The business relationship between the Mount Waddington Regional District (MWRD), BHP, and the GVRD (and any other agencies involved) would be based on each specific request for proposal and negotiated to arrange a mutually satisfactory agreement.

Proponent

BHP owns and operates Island Copper Mine, 14 kilometres south of Port Hardy on the north end of Vancouver Island. The mine employs 560 people, which is about 20 percent of the population of Port Hardy. They have been operating the mine for 23 years and have an international reputation for expertise in pit dewatering systems, ground and stormwater collection systems, and slope stability engineering. The company is a wholly-owned subsidiary of the Broken Hills Proprietary Company Limited of Melbourne, Australia, which is Australia's largest company in the resource extraction industry. The company has $21.4 billion (CDN) in assets, employs approximately 49,000 people in 50 countries, and has 201,000 shareholders in more than 80 countries. The mine delivers typically 250,000 tons of copper concentrate to smelters in Asia and 4,600 tons of molybdenum concentrate to Europe and South America every year.

In exploring the feasibility of development and operation of a residual solid waste management facility at Island Copper Mine, BHP has worked with a number of companies and individuals with expertise in landfill design, leachate and gas treatment, transportation, and hydrogeology and geology. They have also assembled a group of advisors with wide range of expertise for the purpose of reviewing and assessing project development and operation.

BHP has retained specialists to provide improvements and innovations in the collection, handling, processing, and disposal of waste and resource recovery. Specialists have also been responsible for the preliminary landfill design. They have also commissioned detailed studies of leachate treatment to provide data for use in treatment plant design and for use in the development of landfill gas treatment systems for the proposed landfill. BHP has also commissioned studies of marine route and vessel selection for the facility and for design of appropriate port facilities.

Other consultants have been involved in the environmental monitoring and practices of Island Copper Mine as well as in the geological and hydrogeological assessments required for the mining operation and the proposed disposal facility.

Disposal Site

The below-sea-level open pit is 2.4 kilometres long, 1.2 kilometres wide, 390 metres deep at the lowest point, and lies next to Rupert Inlet in Quatsino Sound. The capacity of a landfill in the pit is close to 380 million cubic metres, with an estimated life span of 500 years at 625,000 tonnes per year, or 250 years at 1.25 million tonnes per year.

The assets at the mine site include flat land, mine water supply, 75 MW power supply, a regular ocean shipping system between the north island and the lower mainland, and the physical infrastructure, such as roads, on site.

The area in the vicinity of Island Copper Mine (ICM) pit is underlain by various rock formations intruded with rock from the Jurassic and Tertiary age and overlain with Cretaceous sedimentary rock. The actual mine site is located in volcanic rock with the ore zones situated in a Quartz-Feldspar Porphyry dyke. The volcanics largely consist of bedded and massive tuffs and formational breccias. With the dyke intrusion, there could be a degree of jointing of the rock, and if the volcanics are basaltic, there could be a large number of defects that could conduct water. BHP states that rainfall accounts for the largest percentage of water pumped out of the pit annually (4.5 M cubic metres per year), there are no aquifers intersecting the pit walls, and the permeability of the pit walls ranges from 10^{-5} to 10^{-8} cm/s decreasing with depth. Since the mine is below sea level and right next to Rupert Inlet, the groundwater gradient was found to be into the pit, but marine water penetration has not prevented the mine from operating to full capacity. BHP indicated that they believe the landfill would not be affected by groundwater penetration streams.

The pit has a history of pit slope failure, which will continue for the remainder of the mine life and after closure. The mine operators have developed techniques for coping with such failure during active mining, and similar techniques can be applied for ongoing operations as a municipal solid waste facility. Slope failures are a natural occurrence in mining and do not normally hinder operations or pose a threat to operating personnel. It is expected that some flattening of the mine walls will occur over time and the main effect will only be some loss of volume for landfill. A great deal of seismic study data is available for the pit and would be used during a feasibility study if and when it is performed.

The conceptual design of the landfill was developed to ensure conformance with the Draft BC Landfill Criteria (not final at the time of design), and on proposed US Subtitle D standards. The design of the landfill includes a leachate and stormwater management system. Waste deposition would be within bedrock where permeability is low, and the water table is more than 300 metres above the initial placement of waste. This would provide a natural barrier to leachate migration and runoff. Hydraulic systems pump the water up and out of the pit. Initial estimates of leachate volumes are 190 to 1,900 cubic

metres per day. The quantity would be stored in lined ponds, recirculated to increase the rate of decomposition, and then pumped to the surface to treatment ponds. A zone of relatively high permeability around the pit wall and waste interface will be created using permeable mine spoils. Between this layer and the waste, a low permeable soil barrier will be installed as waste builds up, in order to create a barrier between perimeter runoff and the garbage. Stormwater and leachate will be handled and treated separately.

Gas generated would be collected using extraction fans and then used as fuel. Excess fuel would be burned off. Initial placement of waste will be in as little an area as possible and will continue in horizontal layers of 15 metres to 30 metres in depth. At the end of each day, waste would be covered with soils derived from mine waste rock. Intermediate covering will take place throughout the filling process, and when a final elevation of 90 metres below sea level is reached the landfill will be capped and covered with a 60-metre layer of salt water and then fresh water to the pit surface. The salt water zone would stabilize acid production in the rock.

Transfer and Transportation

Pre-sorted municipal solid waste would be compacted and baled at transfer stations before being loaded into containers for shipping. The containers would be trucked to a shipping terminal on the Fraser River and then transported by barge or roll-on/roll-off vessel to the mine pit. Container ships are presently available for sale or lease on the international market, or they would be built for the project. There are two possible shipping routes from the GVRD to the facility:

- Western route: Around the south tip of Vancouver Island, through the Strait of Juan de Fuca, and then on to Quatsino Sound and Rupert Inlet
- Eastern route: Through the Strait of Georgia on the east side of Vancouver Island to Port McNeil

From the western route, containers would be transferred to specially equipped dumping chassis for transport to the tipping face. From Port McNeil the containers would be transferred to dumping chassis, transported by truck, and taken to the tipping face. Empty containers would be shipped back to the GVRD transfer stations. If the eastern route to the facility were used, parts of an industrial road from Port McNeil to the landfill may need to be upgraded. There are suitable shipping facilities at both ends of the proposed route that would require minimal upgrading.

Although specific proposals have not yet been submitted, there have been expressions of interest from local forest industries and fisheries representatives for backhaul

opportunities. The potential for backhauls and other spin-off developments are not expected to be known until landfill plans are more definite.

Engineering studies of the project at this stage have been based on BHP ownership and operation of the marine transport system including the vessels, container terminals, terminal equipment, containers, and some road transport equipment. It is assumed that some road transport and some marine transport capacity would be chartered or contracted. The exact configuration will depend on the source and quantity of wastes.

Maintenance of containers and equipment will be done wherever it is most economical and technically efficient. Island Copper Mine has extensive maintenance shop facilities at the minesite, and these would be used to the greatest possible extent.

Environmental Suitability

Air Impacts

The main air impacts associated with the project would result from gas generated during decomposition of refuse in the landfill and from transportation of waste to the facility. BHP plans to install a gas collection system that would conform to the requirements of the BC Landfill Criteria. Gas would be either flared or recovered for industrial applications. Gas would be generated at a more rapid rate than the sites included in the other proposals, because the relatively high annual rainfall (1,978 mm) will speed-up decomposition because of a high moisture content of the refuse. The site is in a remote area, and air emissions from landfill gas and operations (dust, noise) should have relatively minor local impacts.

As a mode of transport, the barge is generally recognized as more fuel efficient than transport by rail or by truck (U.S. Department of Transportation, 1980). However, the facility is about 550 kilometres from the GVRD using the western route to the facility.

Water Impacts

The water impacts at the landfill are likely to be somewhat greater than the other proposals, again because of the relatively high rainfall at the site. However, systems are already in place to manage the high volume of water that collects in the pit, and any stormwater or leachate would be collected and pumped out of the pit for treatment. Since the pit is below sea level there will be no runoff out of the pit, only into the pit. Except for Rupert Inlet, there are no surface water bodies nearby that could be contaminated with leachate if it were to escape the confines of the pit or the treatment facilities.

According to Ministry of Energy and Mines (MEM) officials, the closure and reclamation plans for the present operating mine would include blasting away parts of the sea wall to let Rupert Inlet water into the pit, filling the pit with rainfall water (over 20 years or so), or filling the pit with solid waste, capping and flooding with salt water then fresh water. A fresh water lake would become acidic according to MEM officials, and would require ongoing treatment if it were to be used for any purpose. The closure and reclamation process has been underway for five years now, with the landfill proposal being part of the plan for just the past year. The MEM holds an extensive reclamation bond which BHP will get back upon final closure and reclamation of the mine. Whether or not the landfill option is considered as part of the reclamation is still undecided. Neither the MEM nor the MOELP have dealt with similar proposed mine closure/landfill systems in the province to date.

Conformance with the BC Landfill Criteria will take an interpretation by MOELP because of the unusual nature of the site. When questioned about the proposed landfill closure plans and the need for stratification of salt and fresh water, both MEM and MOELP representatives agreed with the need for prevention of acid production in the pit if it were flooded. Also, at this very preliminary stage, they could see no problem with capping a landfill with the available waste rock before flooding.

Local Acceptability

To determine whether there was support for the project locally, the conceptual proposal was first aired and discussed in the MWRD. Subsequent to these discussions, the proposal was disclosed to a wider public audience and communicated to government agencies. To further ensure that all parts of the community are given an opportunity to be heard, BHP, in conjunction with the MWRD has established a Local Advisory Round Table to discuss the issues raised by the proposal. If the project proceeds to a feasibility study the committee will continue to act as a communication corridor to the various interest groups.

During a telephone conversation on October 22, 1993, the Village of Port Hardy Clerk-Treasurer indicated that there has been little response to the proposal thus far because the feasibility study has not yet started. He said that some opposition may occur from residents in Coal Harbour who have already voiced some concerns (they are the closest community to the mine). He sees there being general support from the communities in the area. (Employment after mine closure is a main issue in the area.)

During a telephone conversation on October 25, 1993, an Economic Development Officer with the MWRD stated that community opinions about the proposal appear to be split depending on whether the resident's focus is economic or environmental. She stated that there has been some opposition to the project on environmental grounds from residents in

Quatsino, Sontula, Coal Harbour, and Holberg, but that there has been general support based on economic issues everywhere else in the district.

Discussions with MEM and MOELP personnel responsible for regulatory activities at Island Copper Mine indicate that the small communities on and near Rupert Inlet that are not directly associated with the mine will voice some concern regarding the impact of the proposed transportation traffic. Both representatives of the Ministries offered opinions that more residents are likely to support the project than resist its implementation. A representative from MOELP suggested that BHP would not require a Waste Management Permit as all landfill operations have in the past, but rather will require an operating certificate according to the new provincial solid waste management planning process.

The BHP Proposal to the GVRD included letters of support for proceeding with a feasibility study for the landfill from seven jurisdictions and organizations and a letter from the Quatsino Residents' Organization indicating their opposition to development of the facility.

Other Environmental Impacts

BHP has been monitoring the environment surrounding the mine since 1969. Currently, a staff of five full-time scientists and technologists are engaged in both oceanographic and terrestrial monitoring. Biological oceanographic sampling results are available in BHP's Annual Environmental Assessment report, which is submitted to BC Environment. A salmon rearing facility exists 6 kilometres from the site in Holberg Inlet, and the mine area supports most of the wildlife species common to northern Vancouver Island.

In a written correspondence dated November 8, 1993, BHP stated that "it is unlikely that the landfill operation will significantly impact the status of wildlife presently existing around the mining operation." Terrestrial resources will not be impacted any more than they already have with the open pit mining operation. The proposed landfill site is already a sizable pit in which all activity would be hidden from outside view, and since there are no villages next to the pit the proximity of the proposed landfill should not be a problem. Our limited inquiries did not reveal any cultural or historic resources of significance that would be affected by the current mining operation or the proposed landfill. This is not to say there is no Native Indian cultural significance associated with the site.

The socioeconomic benefits of the project could be significant by preserving the jobs of many local residents, who otherwise would probably be forced to leave the area once the mine was closed.

Conformance with BC Landfill Criteria

BHP plans for the facility to conform to the BC Landfill Criteria. We did not uncover any evidence that the facility would not be able to conform, though the unique nature of the facility will require MOELP to use judgement in determining whether the facility will satisfy the intent of the Criteria.

THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Environmental Protection Committee — DATE: September 15, 1994

FROM: F. K. K. Cheung, P. Eng.
Project Engineer — FILE No: EPC

SUBJECT: **1993 - 94 ANNUAL REPORT - COMMISSION ON RESOURCES AND ENVIRONMENT**

RECOMMENDATION:

1. That Committee receive this memorandum for information only.

BACKGROUND & COMMENTS:

The 1993 - 1994 Annual Report from the Commission on Resources and Environment was submitted to the Legislative Assembly in accordance with section 12 of the Commissioner on Resources and Environment Act. The report generally covers the period from April 1, 1993 to March 31, 1994.

The table of contents include:

1. A Sustainable Future.
2. Commission Mandate and Work Summary.
3. Key Elements of a Land Use Strategy.
   - 3.1 Provincial Direction.
   - 3.2 Participatory Planning Processes.
   - 3.3 Coordination.
   - 3.4 Independent Oversight.
   - 3.5 Dispute Resolution.
4. Summary of Next Steps.

Committee members can review the Report on a rotational basis, since only one report was received by the City.

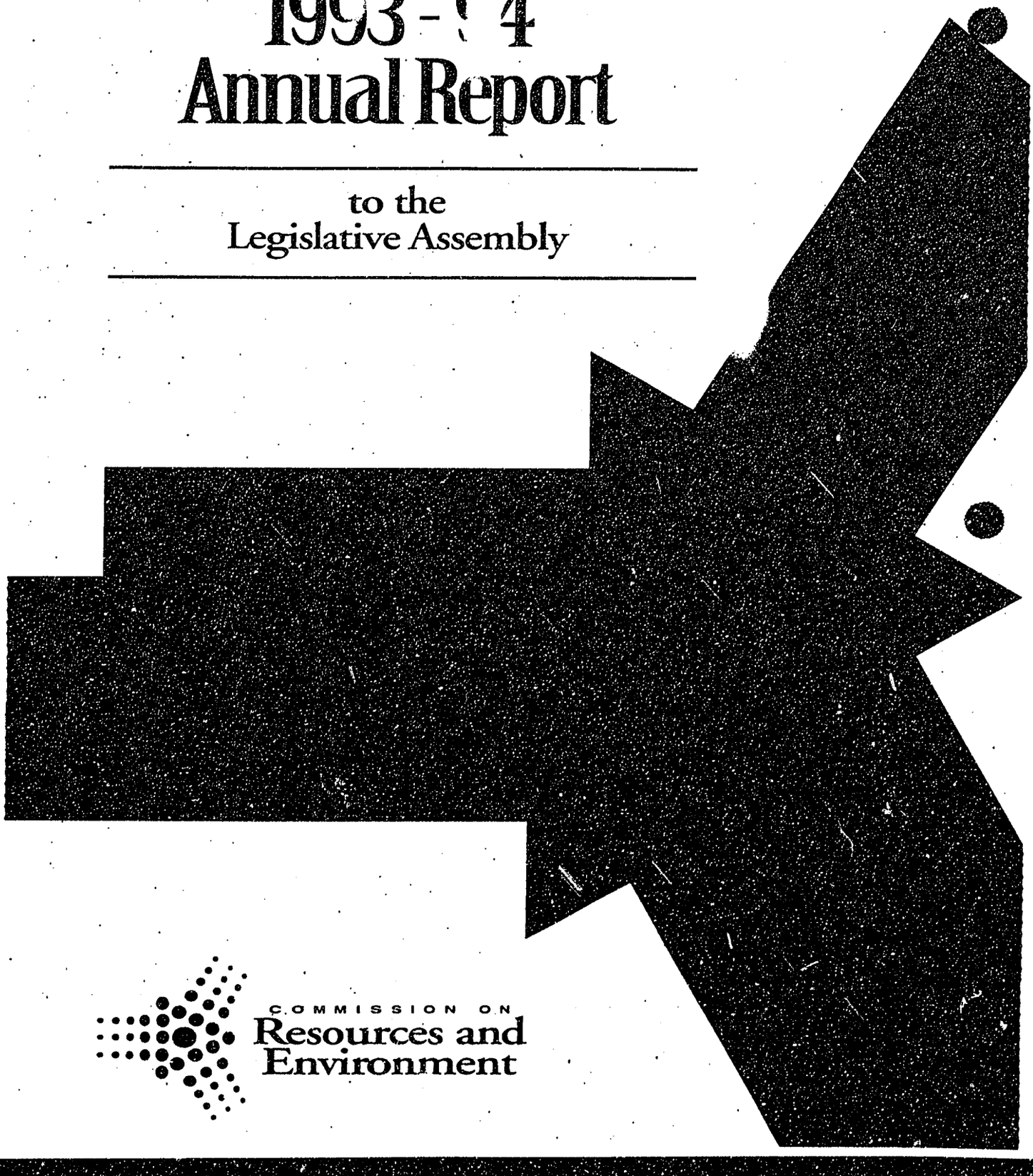
F. K. K. Cheung, P. Eng.
Project Engineer

FKKC/
attachment

SEP 2 8 1994

1993-94 Annual Report

to the
Legislative Assembly



COMMISSION ON
Resources and
Environment

BC hydro
August 1994
UPDATE

Hydro's annual report for fiscal 1994 now available

Low water conditions affect net income

Lower than average water inflows to B.C.Hydro's reservoirs for the year ending March 31, 1994 resulted in a decrease of 13 per cent in hydraulic generation from the previous year.

The reduction meant in order to meet the electrical requirements of its customers, Hydro had to purchase more costly electricity from other sources and increase thermal generation while curtailing its revenue-producing exports. Electricity trade income of $38 million for the year was $41 million less than last year.

As a result, net income of $190 million for the year was $111 million lower than it was in fiscal 1993 — a 37 per cent decrease.

Hydro's latest annual report also notes continuing record growth in the number of customers served by the utility, totalling 1.4 million at year-end. This represents an increase of 10.9 per cent in just four years. As a result of unusually mild winter weather, however, the volume of electricity sold during the year covered by the report decreased slightly.

In his corporate letter, Hydro chair John Laxton says that customer participation in the utility's five-year-old *Power Smart* program has "freed up 1400 GW.h (gigawatt-hours) of electricity" — enough to supply new customers added since the program's inception "at roughly half the cost of adding new generation facilities."

In addition to providing detailed financial and operating information, Hydro's 1993-94 annual report outlines the utility's various corporate strategic initiatives, including its work with industrial and government bodies and aboriginal groups to create new business opportunities and employment in British Columbia.

Copies of the report may be obtained from Hydro's Information Centre, 2nd floor, 333 Dunsmuir Street, Vancouver, B.C. V6B 5R3. Telephone (604) 623-4152 or fax (604) 623-3515.

Study completed on cooling water discharges from Burrard Thermal plant

Government to review report; Hydro to study dechlorination options

A draft report on the impacts of cooling water effluent from B.C.Hydro's natural gas-fired Burrard Thermal Generating Station has been sent to government agencies for technical review.

The report contains the results of a recently completed study by the firm of Seaconsult Inc., which looked at a range of impacts under current and possible future operating regimes for the plant. The study was initiated as part of Hydro's $270 million Burrard Upgrade Project.

The major impact identified under all scenarios was from residual chlorine concentrations. While the plant's chlorine discharge concentration at the end of the "pipe" remains well within the terms of the current permit issued by the provincial Ministry of Environment, Lands and Parks, background concentrations of residual chlorine in the Port

continued

INSIDE

Moody Arm of Burrard Inlet exceed the provincial criteria for marine waters. These higher background concentrations are created because Burrard's effluent water "plume" does not disperse as effectively, and residual chlorine does not decay as quickly, as previously anticipated.

The report recommends moving to dechlorination at the thermal plant. In response, Hydro has initiated a study of both mechanical and chemical alternatives for reducing chlorine use.

The Seaconsult study also provided an assessment of the impacts from cooling water volume and temperature. These were identified to be less serious than those of residual chlorine since the species most at risk — juvenile salmon being raised in local sea pens — are usually not present in the pens during the maximum temperatures, which typically occur in the month of August.

Also coming out of the report were recommendations for further monitoring and study work at the plant. These activities, together with the dechlorination options study, will be taking place during the summer and fall.

Should an eventual decision be made to make changes to the plant's cooling water discharges, application would have to be made to the provincial Ministry of Environment, Lands and Parks for an amendment to the existing effluent permit.

New fish weir installed at Duncan Dam

Upstream migration of bull trout enhanced

At a recent ceremony involving members of the surrounding community, a new fish weir at Hydro's Duncan Dam in the Kootenays was officially opened.

Completed in 1967 as the first of three Columbia River Treaty dams, Duncan Dam straddles the Duncan River, about 42 kilometres north of Kaslo. Behind the dam, Duncan reservoir provides the capability of storing 1.7 trillion cubic metres of water for flood control and power production in both Canada and the United States.

As part of Hydro's corporate commitment to the environment, the new weir was designed to improve the movement of local bull trout populations to the reservoir from the tailwaters of the Lardeau and Lower Duncan Rivers below the dam.

The structure furthers the work of local resident Huibertus "Dutchy" Wageningen — former dam caretaker — who pioneered a method of transferring the fish, using the dam's low level operating gate, the maintenance gate and the discharge tunnel.

The new fish weir provides a more effective way and allows even the smallest of bull trout to migrate upstream. Part of the process still involves some elements of the basic technique developed by Wageningen.

Before the weir was installed, it was estimated that hundreds of bull trout of various sizes migrated to the dam each season. The new structure is expected to lead to an increase in the population and contribute to a thriving fishery in the area.

Two recent Hydro reports available for review

Distribution Service Performance report and Cost of New Electricity Supply in B.C. published in June

Hydro's latest Distribution Service Performance report, analyzing a number of key performance indicators which measure frequency and severity of outages at the customer level, has just been released.

The eighth annual report covers the fiscal year beginning April 1, 1993 and provides an overall view of the utility's electrical distribution system performance. While the indices used do not offer absolute and definitive answers to system performance, the information obtained allows management to assess system performance and set priorities for changes or programs needed for service improvements.

The latest report shows reliability decreased slightly from the previous year but continues to be better than the Canadian Electrical Association average. The decrease in performance is mainly due to an increase in storm activity and source outages; the latter is due in part to improved reporting.

The report goes into considerable detail by region but, generally — during the period covered — indicates that storms were responsible for 36 per cent of total customer-hours lost, and source outages for another 23 per cent. Fallen trees and vegetation growth also contributed measurably to increases in both frequency and severity of outages.

• • •

B.C.Hydro's Resource Planning group has issued its latest CONES (Cost of New Electricity Supply) estimates in a report that forecasts the expected cost of obtaining new firm energy and capacity in each of the utility's nine major transmission regions.

The document also provides information on the value of non-firm (secondary) energy, and the methodology for computing capacity quantities and values.

Information in the report is based on the December 1993, 20-year electric load forecast, and the expected availability and cost of resource acquisitions. The CONES report is meant to be a screening tool and the estimates are provided to the private power industry and other users for guidance only.

Estimates include adjustments for the monetized social costs now incorporated in Hydro's evaluation of resource acquisitions, as detailed in a separate publication: B.C.Hydro Resource Acquisition Policy.

Since the last CONES report, a number of developments have led to adjustments in Hydro's costs, including:

- increased U.S. fish flow requirements on the Columbia River,
- regulatory approval to pursue long-term export contracts,
- a switch back to capacity products from the energy orientation used previously,
- higher near-term natural gas prices, and
- higher estimates of air emission damage costs.

The report notes, "Since costs are reported at the 500 kV level, area transmission, and distribution costs are <u>not</u> included in the estimates presented. This limits the use of CONES estimates with respect to analysis of rates and other lower voltage supply issues."

In addition, says the document, costs "are <u>not</u> applicable to B.C.Hydro's non-integrated areas."

Both reports are available for review in Hydro's Information Centres at 333 Dunsmur Street in downtown Vancouver or at the utility's Edmonds complex in Burnaby. Copies may be obtained by calling 623-4152 or 528-3167 respectively.

Hydro's popular safety video wins another honor

National and international awards now total twelve

Hydro's safety video *Electrojuice* — directed towards teenagers (see *Update* August 1992) — was thrice-honored recently at the 35th annual Cindy Awards competition in Anaheim, California. The event is sponsored by the Association of Visual Communicators.

The production won a gold Cindy in the educational category as well as a special achievement award for art direction/writing/directing/talent and original music. In addition, the video was first runner-up for the John Cleese Comedy Award which recognizes the effective use of humor to convey a message.

It is believed *Electrojuice* has now won more awards than any other safety production in the world, having been recognized by at least a dozen national and international video festivals.

Electric System Operations Review concludes with report to government

Social benefits of alternative operations measured against costs of lost generation

The results of B.C.Hydro's Electric System Operations Review (ESOR) have now been presented to the provincial government in a thick, three-volume report.

The ESOR was initiated by a government directive in June 1993 (see *Update* June/July 1993, February 1994 and June 1994). During the review, Hydro's integrated electric system operations were examined and alternative operations were identi-

fied and evaluated in terms of their potential for increased social benefits for the province. The process emphasized public consultation and relied heavily on the involvement of a number of community groups.

In actual practice, says the report, ". . . approximately one-half of team efforts were applied to the identification and analysis of issues and alternatives, and one-half to public consultation."

This was believed to have been "sufficiently thorough to provide adequate information and a good understanding of the operation of the integrated electric system and its implications." Recognized also, however, was the need to continue discussions with various stakeholders "for further development of understanding, and for decision-making that considers the social implications of operations."

The Joint Multiple Account Evaluations for large installations was considered to be "a strength of the review, and improved the findings."

Chapter Eight of the report presents the results and findings of the ESOR, among which are the following:

- ". . . implementing the potential alternative operations identified for the major installations on the Peace and Columbia rivers, for Burrard Thermal G.S., and, to a lesser extent, for the Bridge River generating facilities, would incur very high costs in lost generation."
- "In general, the costs of the alternatives for the large installations, estimated in monetary terms, varies from one order of magnitude to three orders of magnitude greater than the non-power benefits estimated in monetary terms."
- "For the smaller installations, the benefits to be gained from the potential alternative operations would have relatively lower cost."
- "Much work remains to be done before there can be general application of the subjective application of the intangible elements of full social costing to decision-making."

Those who participated in the consultation process will now review the report and study its findings while a technical analysis takes place at the government level.

Copies have been placed in Hydro's district offices and in public libraries for review by interested parties.

More *Power Smart* savings

Chilliwack Hospital, Pacific Rim park move towards energy efficiency

With the help of B.C.Hydro's *Power Smart* program, Chilliwack General Hospital has incorporated advanced energy-efficiency features into its recently-completed Heritage Village multi-care facility.

The reduction in electricity use is projected to be equivalent to the yearly needs of 36 homes; the hospital expects to save $18,000 on its annual electricity bill.

On the rugged west coast of Vancouver Island, officials of Pacific Rim National Park Reserve, located between the communities of Tofino and Ucluelet, have signed an energy-efficient agreement with *Power Smart*.

Under the terms of the partnership agreement — believed to be the first involving a national park — Hydro is committed to providing technical assistance and other help while the park is obligated to appoint an energy manager, to upgrade facilities and equipment to higher energy-efficiency standards, to prepare a three-year energy-use plan, and to train employees in ways to save electricity.

As a result of the cooperative effort, park officials expect to achieve an eight per cent reduction in the 580,000 kilowatt-hours of electricity used each year.

Update **is a monthly newsletter from B.C. Hydro for elected officials, community and business leaders and others with a special interest in the utility's activities. For questions or comments call (604) 623-4529, fax (604) 623-3730 or write *Update*, Corporate Communications, B.C. Hydro, 16th Floor, 333 Dunsmuir Street, Vancouver, B.C. V6B 5R3**

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THE CORPORATION OF THE
CITY OF PORT COQUITLAM

MEMORANDUM

TO: Environmental Protection Committee DATE: September 26, 1994

FROM: Anne T. Pynenburg
Project Technician

SUBJECT: **BC YOUTH SOCCER - DONATION**

BACKGROUND & COMMENTS:

Attached is a copy of a letter and advertising from the BC Youth Soccer Publications requesting that the City donate $120 towards a green advertisement in their souviner program for the Mini-Soccer Festival. The Festival is to be held at BC Place Stadium from Dec. 29, 1994 to Jan. 2, 1995.

Last year the Environmental Protection Committee approved a donation of $120 towards last year's similar event.(See advertisement attached)

COMMENTS:

1) Donate $120 towards the "Keep Greater Vancouver Beautiful" since it was done last year.

2) Decline to make a donation as the publication of the souvenir program does not relate to environmental issues.

Richmond, Coquitlam and White Rock have committed to make a donation.

Anne T. Pynenburg
Project Technician

SEP 28 1994

B.C. YOUTH SOCCER PUBLICATIONS

Published by
B.C. YOUTH SOCCER ASSOCIATION

DATE Sept 22/94

TELECOPIER COVER LETTER FROM: Steve Smith

PLEASE DELIVER TO: Anne Pynenburg to E.P.C

We Are Transmitting 5 Page(s) including This Cover Letter.

If You Do Not Receive All Copies, Please Call 482-3112

E.P.C MEMBER:

LAST YEAR SOMEONE AUTHORIZED YOUR INCLUSION IN THE B.C YOUTH SOCCER SOUVENIR PROGRAM.

CITY OF RICHMOND AND CITY OF BURNABY HAVE INDICATED SOME SUPPORT AGAIN IF ALL OTHERS CONCUR.

THE COST WAS AND IS $120 PLUS G.S.T AND WE WOULD BE VERY GRATEFUL IF WE COULD COUNT ON YOUR SUPPORT ONCE AGAIN.

THANKING YOU IN ADVANCE FOR YOUR INTEREST IN THIS MATTER.

SINCERELY
Steve Smith

SEP 28 1994

B.C. YOUTH SOCCER PUBLICATIONS

BC List (Advertising Co-ordinator)
BC Youth Soccer Publications
8278 Manitoba Street
Vancouver, B.C. V5X 3A2
Telephone (604) 482-3102 Fax: (604) 482-3129

Dear ANNE / E.P.C MEMBER

Further to your recent telephone conversation with one of our staff members, I trust the following will provide you with the information you require concerning the staging of the 9th Annual Canada Safeway Mini-Soccer Festival to be held at B.C. Place Stadium, Vancouver, from December 29, 1994 to January 2, 1995.

The Festival is one of the most popular events in the BCYSA's calendar and is geared toward girls and boys in the 7-9 year-old age group. Some 150 teams will be participating in the event this year which translates into some 1800 players and close to 500 team coaches and managers.

The B.C. Youth Soccer Association will again produce a high quality souvenir program for the event. The program is printed on 70-lb Luna Gloss. To keep production costs to a minimum, we try to enlist the support of the business and professional community, as well as our corporate sponsors.

The B.C. Youth Soccer Association is a non-profit amateur sports organization registered under the Societies Act of British Columbia and affiliated with Sport B.C. The Association is recognized by the Provincial Government as the official governing body of organized youth soccer in the province, and is a member of the Canadian Soccer Association. The Association currently registers well over 57,000 boys and girls between the ages of 6 and 18. In purchasing advertising space in one or more of our publications you are helping to keep registration fees to a minimum and allowing our organization to continue to produce quality newsletters, event programs and information booklets for our members.

On behalf of our volunteer provincial board of directors, may I take this opportunity to thank you for taking the time to consider supporting organized youth soccer in British Columbia. We are most grateful for the continuing patronage we receive from the business and professional communities, and particularly individuals like yourself!

I hope that you will support the Association with this publication!

Sincerely,

Keith Liddiard,
Executive Administrator.

Atchmt/Encl.

PAGE SIZE (8 1/2 X 11)

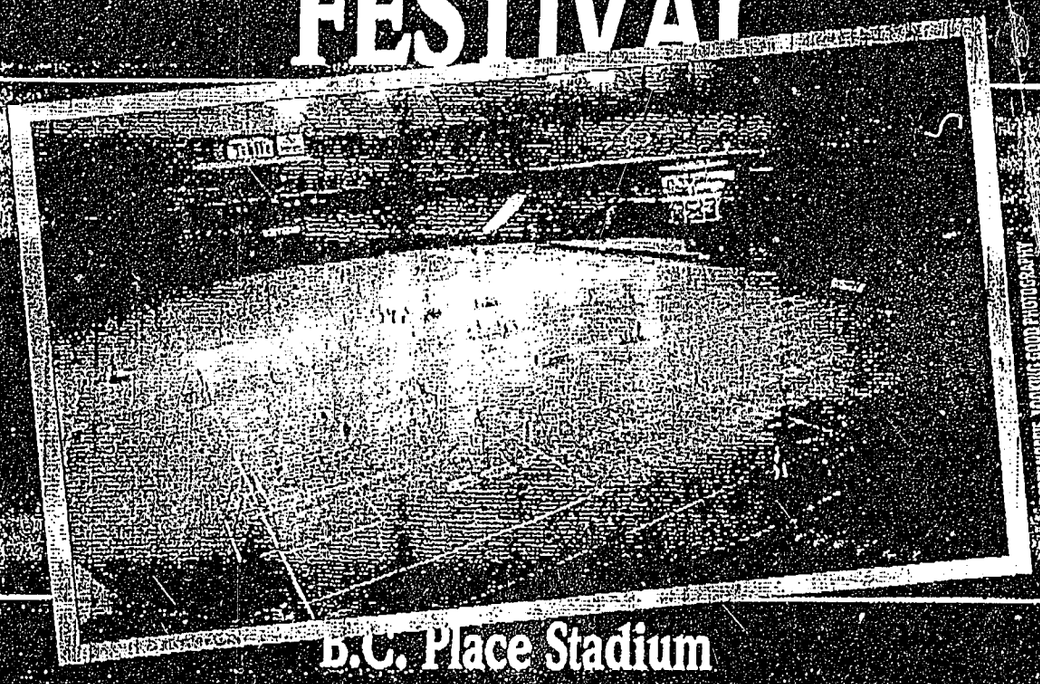
Full Page (7 X 9)	$899.00	Twelfth Page (3 1/2 X 1 3/8)	$169.00
Half Page (7 X 4 1/2)	$499.00	Sixteenth Page (3 1/2 X 1)	$129.00
Quarter Page (3 1/2 X 4 1/4)	$299.00	Bus. Listing (3 1/2) X 5/8)	$ 99.00
Sixth Page (3 3/4 X 3)	$269.00	Good Luck Ad (1 7/8 X 5/8)	$ 69.00
Eighth Page (3 1/2 X 2 1/8)	$229.00	Patron Line	$ 49.00

$120

If you require further information, please give me a call at 482-3112

BRITISH COLUMBIA YOUTH SOCCER ASSOCIATION

8TH ANNUAL CANADA SAFEWAY MINI-SOCCER FESTIVAL



B.C. Place Stadium

December 30, 1993 - January 3, 1994

Official Souvenir Program $2.00

KEEPING GREATER VANCOUVER BEAUTIFUL
THE 3 R's of RECYCLING

REDUCE

RECYCLE

REUSE

matsqui

City of Richmond

City of Burnaby

This time of year is one where the 3 R's of Reduce, Re-use, and Recycle can take on a new significance.

Reduce is the most important of the R's, and residents are encouraged to be smart shoppers and look for good packaging instead of overpackaging.

Re-use is the second of the R's, and residents are encouraged to look for packaging and containers that can be re-used.

Recycle is the last of the R's. Recycling is easier than ever with your local municipal Recycling program. Please contact your municipality for details

CITY OF PORT COQUITLAM

SURREY BRITISH COLUMBIA

City of Whiterock

New Westminster

CITY OF COQUITLAM

Canadian national team star Paul Peschisolido is a big hit in Birm

Staff file photo by Rick Cowman

CANADA INVADES EUROPE

Canadians playing soccer in Europe, with their home towns and club:

ENGLAND
Premier Division
- Craig Forrest: Coquitlam, (Ipswich Town)
- Frank Yallop: New Westminster, (Ipswich Town)

First Division
- Geoff Aunger: Coquitlam, (Luton Town)
- Alex Bunbury: Montreal, (West Ham United, reserve team)
- Paul Fenwick: St. Catharines, Ont., (Birmingham City)
- Lyndon Hooper: Ottawa, Birmingham City, reserve team)
- Trevor Kuntz: Maple Ridge, (Luton Town, reserve/youth team)
- Niall Thompson: Surrey, (Crystal Palace, reserve team)
- Paul Peschisolido: Pickering, Ont., (Birmingham City)

Second Division
- Oliver Heald: Vancouver, (Port Vale)

SCOTLAND
First Division
- Colin Miller: Vancouver, (Hamilton Academicals)

ITALY
Third Division
- Enzo Concina: Toronto, (Piacenza)

THE NETHERLANDS
Second Division
- Randy Samuel: Richmond, (Fortuna Sittard, second division)

PORTUGAL
Second Division
- Carlos Batista: Vancouver, (Sporting Clubo Covitha)

ON TRIAL
- Mark Watson: West Vancouver (Ipswich Town)
- Fernando Aguiar: Toronto, (Birmingham City)

10 OF 16 CANADIANS PLAYING SOCCER IN EUROPE ARE FROM B.C. - TESTAMENT TO SUPPORT FROM INDIVIDUALS & COMPANIES IN PROVINCE

SEP 28 19