



INVITATION TO TENDER (“ITT”) No. PS09119

SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC
TRANSFER SWITCH

Tenders will be received in the Purchasing Services Office, 3rd Floor, Suite #320, East Tower, 555 West 12th Avenue, Vancouver, British Columbia, Canada, V5Z 3X7 prior to the Closing Time: 3:00:00 P.M. Vancouver Time (as defined in Note 2 below), Tuesday July 7, 2009 and registered at 11:00:00 A.M Wednesday July 8, 2009.

NOTES:

1. Tenders are to be in sealed envelopes or packages marked with the Tenderer’s Name, the ITT Title and Number.
2. Closing Time and Vancouver Time will be conclusively deemed to be the time shown on the clock used by the City’s Purchasing Services Office for this purpose.
3. The City’s Purchasing Services Office is open on Business Days 8:30 A.M. to 4:30 P.M. Vancouver Time and closed Saturdays, Sundays, and holidays.
4. DO NOT SUBMIT BY FAX.

All queries related to this ITT shall be submitted
in writing to the attention of:

Eamonn Savage,
Contracting Specialist

Fax: 604.873.7057 E-mail: purchasing@vancouver.ca

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PART A - INSTRUCTIONS TO TENDERERS**

NOTE: The definitions set out in Section 1.0 of Part B - General Conditions apply throughout this ITT, including this Part A of this ITT, except where otherwise expressly stipulated or the context otherwise requires.

1.0 Description of Requirement

1.1 The City of Vancouver (the "City") invites interested and qualified parties (the "Tenderers") to submit tenders ("Tenders") for the supply of a Diesel Generator and Automatic Transfer Switch ("ATS") as part of the Vancouver Landfill Pump Station Controls Upgrade Project. The successful Tenderer will be required to manufacture, deliver and commission a diesel generator in a weatherproof enclosure, including generator controls and all accessories, a fuel tank, and an automatic transfer switch.

1.2 Tenderers are required to submit a Tender for the full Requirement only. Partial responses may be put aside and given no consideration.

2.0 Contract Term - Intentionally Omitted

3.0 Pricing

3.1 Pricing shall be held firm for the period of one year.

3.2 Prices quoted will be in Canadian currency and exclusive of all taxes, F.O.B. destination to the site(s) named herein, with all freight, unloading at destination, import duties, brokerage, royalties, handling, overhead, profit and all other costs included.

4.0 Conduct of the Contract - Inquiries and Clarifications

4.1 The City's Manager - Supply Management will have conduct of this Invitation to Tender (the "ITT"), and all communications are to be directed only to the contact person(s) named on the cover page.

4.2 It is the responsibility of the Tenderer to thoroughly examine these documents and satisfy itself as to the full requirements of this ITT. Inquiries are to be in written form only, faxed or e-mailed to the contact person shown on the cover page on or prior the deadline for inquiries and clarifications. If required, an addendum will be issued to all Tenderers.

4.3 The lowest or any Tender may not necessarily be accepted and the City of Vancouver will not be responsible for any cost incurred by the Tenderer in preparing the Tender.

4.4 Tenders are scheduled to close at the Closing Time listed on the cover page of this ITT.

4.5 Tenderers should note the following key dates:

Event	Dates
Deadline for Inquiries and Clarifications	June 30, 2009
Deadline for submission of Tenders	3:00:00 P.M. Tuesday July 7, 2009

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5.0 Inspection of Site - Intentionally Omitted

6.0 Submission of Tender

- 6.1 The response to this ITT with all accompanying schedules, appendices or addenda submitted by the Tenderer will be received up to the Closing Time on the date and in the place shown on the title page of this ITT (the "Closing Time"). The Tender shall be submitted on the forms provided in a sealed envelope or package, marked with the Tenderer's name and the ITT title and number.
- 6.2 Tenders received after the Closing Time or in locations other than the address indicated, will not be accepted and will be returned. The City may elect to extend the Closing Time.
- 6.3 The Tenderer should submit four (4) copies of its Tender on the form provided (Part D - Tender Form and Appendix 1) in accordance with the instructions stated herein.
- 6.4 The City's language used in its procurement documents and the responses thereto, shall be English.
- 6.5 The Tenderer should enter its corporate or legal business name on the first page of the Tender Form. The Tender Form should be signed in the place provided by an officer or employee having authority to bind the Tenderer to the terms and conditions of this ITT. All other pages of the Tender Form should be initialled by the authorized signatory in the spaces provided.
- 6.6 Amendments to a Tender may be submitted if delivered in writing prior to the Closing Time in a sealed envelope or package, marked with the Tenderer's name and the ITT title and number.
- 6.7 Tenders may be withdrawn by written notice only, provided such notice is received at the Purchasing Services Office at the address shown on the cover page of this ITT prior to Closing Time.
- 6.8 All costs associated with the preparation and submission of the Tender, including any costs incurred by the Tenderer after the Closing Time, will be borne solely by the Tenderer.
- 6.9 By submitting a Tender, the Tenderer acknowledges and agrees that the liability of the City in connection with the ITT, the conduct or outcome of the ITT, all related processes, decisions and procedures, and any and all duties and obligations in connection with all of the foregoing, is limited in the aggregate to the maximum of \$1,000 (for any and all claims by the Tenderer combined with any and all claims of all other Tenderers and any and all other claimants in connection with the ITT), and that if payment is made by the City into Court (or into trust, for the benefit of all Tenderers and other such claimants, with a law firm reasonably selected for the purpose) of the said sum of \$1,000, then:
- a) that will be sufficient to fully release and discharge the City from all further liability; and

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- b) the Tenderer will, upon the request from time to time of the City, execute and deliver a release (in such form as the requesting party may reasonably prescribe).

7.0 Bid and Performance Security

7.1 Each Tender must be accompanied by a Consent of Surety (Schedule “A” of the Form of Tender) or equivalent duly completed by a surety company authorized and licensed to carry on business in British Columbia and having an office in British Columbia and a Bid Bond, payable to the City of Vancouver, in the amount of ten percent (10%) of the Total Tender Price, and not a dollar amount, as a guarantee of the due execution of the Agreement with the City and the delivery of the Bonds specified in section 7.2 hereof.

7.2 The successful Tenderer shall, within five (5) Business Days from the date of acceptance, provide a Performance Bond in the amount of one hundred percent (100%) of the Tender price and/or other satisfactory security for performance. The surety, issued by a surety company licensed to transact business in British Columbia, must be in a form and contain terms satisfactory to the City’s Director of Legal Services. The cost of the Performance Bond or other surety shall be borne by the Contractor.

7.3 The forms of the Bonds should be those issued by the Canadian Construction Documents Committee as follows:

Bid bond	CCDC 220 (latest)
Performance Bond:	CCDC 221 (latest)

7.4 The Bid Bond of unsuccessful Tenderers will be returned to them as soon as possible after the Contract is awarded and the Bid Bond of the Tenderer to whom the award is made will be returned to him/her upon delivery of a Performance Bond for one hundred (100%) of the Total Tender Price, and commencement of the Work.

8.0 Conflict of Interest

8.1 By submitting a Tender, the Tenderer warrants that neither it nor any of its officers or directors, or any employee with authority to bind the Tenderer, has any financial or personal relationship or affiliation with any elected official or employee of the City or their immediate families which might in any way be seen by the City to create a conflict of interest.

9.0 Evaluation of Tenders and Award of Contract

9.1 Tenders will be evaluated on the basis of the overall best value to City based on quality, service, price and any other criteria set out herein including, but not limited to:

- a) the Tenderer's ability to meet the requirements, qualifications and competencies set out herein;
- b) financial offer including but not limited to prices, operating and maintenance costs, warranty, and any life cycle considerations;

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- c) the Tenderer's business and technical reputation and capabilities; experience and where applicable, the experience of its personnel; financial stability; track record; and references of current and former customers;
 - d) ability of the Tenderer to meet the City's delivery schedule;
 - e) past performance with the City;
 - f) equipment quality, configuration, reliability, availability, age and condition; and
 - g) any other criteria set out in the ITT or otherwise reasonably considered relevant.
- 9.2 The City may elect to short list some of the Tenderers and require short listed Tenderers to provide additional information or details, including making a presentation, supplying samples, demonstrations, and/or additional technical literature. Samples of items, when required, must be submitted within the time specified and at no expense to the City. If not destroyed in testing, they will be returned at the Tenderer's request and expense.
- 9.3 Prior to Contract award, the Tenderer must demonstrate financial stability. Should the City so request, the Tenderer will be required to provide annual financial reports or a set of financial statements prepared by an accountant covering the last two (2) fiscal years.
- 9.4 The City may, prior to Contract award, negotiate changes to the Scope of the Work, the materials, the Specifications or any conditions with any one or more of the Tenderers without having any duty or obligation to advise any other Tenderers or to allow them to vary their prices as a result of changes to the scope of Work, the materials, the Specifications, or any conditions, and the City shall have no liability to any other Tenderer as a result of such negotiations or modifications.
- 9.5 All Sub-contractors of the Tenderer will be subject to the same evaluation process. It is the responsibility of the Tenderer to guarantee that all its Sub-contractors will comply with all the Requirements and terms and conditions set out herein.
- 9.6 Preference may be given to Tenders offering environmentally beneficial products or services.
- 9.7 Award of a Contract is contingent on funds being approved and the contract award being made by City Council, if applicable.
- 9.8 The City will notify the successful Tenderer(s) in writing that it has been awarded the Contract.
- 9.9 The purchase order terms and conditions, excluding the provision titled "The City's Offer", will apply unless otherwise agreed in writing by the City.
- 9.10 The purchase order, the Tender, the ITT and such other documents including all amendments or addenda, shall form the basis for the Contract between the Contractor and the City. In the event of a conflict between any of the Contract Documents, the following documents will take precedence and govern over each other in the following order of priority from highest to lowest:

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- a) subject to Section 9.9, the City's purchase order including the standard purchase order terms and conditions (which may be downloaded from www.city.vancouver.bc.ca/bid/);
- b) or any mutually agreed to amendments between the Tenderer and the City;
- c) the Tender; and
- d) the ITT and any subsequent addenda.

9.11 Where the head office of the successful Tenderer is located within the City of Vancouver and/or where the successful Tenderer is required to perform any Work at a site located within the City of Vancouver, the successful Tenderer is required to have a valid City of Vancouver business license prior to Contract execution.

9.12 The City is not under any obligation to award a Contract and may elect to terminate this ITT at anytime.

10.0 Solicitation

10.1 If any director, officer, employee, agent or other representative of a Tenderer makes any representation or solicitation to any officer, employee, agent or elected official of the City with respect to the Tender, whether before or after the submission of its Tender, the City shall be entitled to reject or not accept such Tender.

11.0 Acceptance and Rejection of Tenders

11.1 Notwithstanding any other provision in the ITT documents, the City has in its sole discretion, the unfettered right to:

- a) accept any Tender;
- b) reject any Tender;
- c) reject all Tenders;
- d) accept a Tender which is not the lowest Tender;
- e) accept a Tender that deviates from the Requirements, Specifications or the conditions specified in this ITT;
- f) reject a Tender even if it is the only Tender received by the City;
- g) accept all or any part of a Tender; and
- h) split the Requirements between one or more Tenderers.

11.2 All Tenders shall be irrevocable and remain open for acceptance for at least sixty (60) days after the Closing Time, whether or not another Tender has been accepted.

11.3 Any deviations from the Requirements, Specifications or the conditions specified in this ITT, must be clearly stated in the Tender. The City will be the sole judge as to what constitutes an acceptable Tender deviation. If no deviations are indicated in the Tender, the City will be entitled to interpret that the Tenderer offers to perform in full compliance of the Requirements, Specifications and conditions stated herein.

11.4 The City may waive any non-compliance with the ITT, the Requirements, the Specifications, or any conditions, including the timing of delivery of anything required

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by this ITT and may elect to retain for consideration Tenders which are non-conforming, which do not contain the content or form required by the ITT or which have not complied with the process for submission set out herein.

12.0 Quantities

12.1 The quantities stated herein are the City's best estimates of its requirements and should not be relied on. Actual quantities may vary.

13.0 Brand Names

13.1 Unless otherwise stated, if and wherever the Specifications state a brand name, make, name of manufacturer, trade name, or vendor catalogue number, it is for the purpose of establishing a grade or quality of goods, material, equipment and/or services only. It is not intended to rule out competition from equal brands or makes. If, however, a product other than that specified is offered, it is the Tenderer's responsibility to name such a product in its Tender. Evidence of equality in the form of samples may be requested.

14.0 Alternates and/or Variations to Specifications

14.1 Except where stated otherwise herein, the Specifications describe what is considered necessary to meet the performance requirements of the City and Tenderers should bid in accordance with such Specifications, or if the Tenderer cannot meet the Specifications, the Tenderer may offer an alternative which it believes to be the equivalent.

14.2 Tenderers shall clearly indicate any variances from the City's Specifications or conditions no matter how slight. The attachment of descriptive literature from which variations may be gleaned will not be considered as a sufficient statement of variations.

14.3 If in addition to bidding on goods, materials, equipment and/or services that meet the Specifications, the Tenderer wishes to offer an alternative, the alternative Tender shall be submitted separately in the same format as the initial Tender.

14.4 The City is not obligated to accept any alternatives.

14.5 The City will determine what constitutes allowable variations.

15.0 Environmental Responsibility

15.1 The City is committed to preserving the environment. Tenderers shall provide environmentally sensitive products or services wherever possible. Where there is a requirement that the Contractor supplies materials, and where such materials may cause adverse effects, the Tenderer shall indicate the nature of the hazard in its Tender.

15.2 The Tenderer agrees to advise the City of any known alternatives or substitutes for such materials that would mitigate the effects of any adverse conditions on the environment.

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16.0 Named Subcontractors

16.1 The Tenderer agrees that the Subcontractors shown in its Tender are the Subcontractors that it proposes to use to carry out the Requirements. The Tenderer agrees to engage the listed Subcontractors and no others in their stead without prior written authorization of the City.

17.0 Freedom of Information and Protection of Privacy Act

17.1 Tenderers should note that the City of Vancouver is subject to the Freedom of Information and Protection of Privacy Act (British Columbia), which imposes significant obligations on the City's contractors to protect all personal information acquired from the City in the course of providing any service to the City.

18.0 Confidentiality

18.1 Information about the City obtained by Tenderers must not be disclosed unless prior written authorization is obtained from the City.

18.2 The Contractor agrees that this obligation of confidentiality will survive the termination of the Contract between the Contractor and the City.

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PART B - GENERAL CONDITIONS

1.0 Definitions

The following words and terms, unless the context otherwise requires, shall have the meanings set out below. Words including the singular number include the plural and vice versa.

“Act of God” means a cataclysmic phenomenon of nature, including earthquake, flood or cyclone. Rain, snow, wind, high water or any other natural phenomenon, which might reasonably have been anticipated from historical records of the general locality of the City, shall be deemed not to be acts of God;

“Business Day” means a weekday (Monday to Friday) that is not a “holiday” as defined in the *Interpretation Act* (British Columbia);

“City” means the municipal corporation, generally known as the City of Vancouver, as described under the Vancouver Charter;

“City’s Designated Representatives” means the City’s employees or representatives who are authorized in writing to deal with the Contractor on behalf of the City in connection with the goods, materials, equipment and services or to make decisions in connection with the Contract;

“Closing Time” means the closing date, time, and place as set out on the title page of this ITT;

“Contract” means the agreement formed between the City and the Contractor as evidenced by the purchase order issued to the Contractor by the City;

“Contract Documents” means the purchase order, the Contractor’s Tender, the ITT and such other documents as listed in the Contract, including all amendments or addenda agreed between the parties;

“Contractor” means the successful Tenderer individual, partnership, corporation or combination thereof, including joint venturers who or which executes the resulting Contract;

“Delivery Date” means the date the City requires the Contractor to deliver the goods to the City’s Delivery Site;

“Delivery Site” means the Vancouver Landfill located at 5400-72nd Street in Delta, BC, Canada unless otherwise stated in this ITT;

“F.O.B.” means all costs of freight, insurance, brokerage, customs duties and all other costs of delivery to the site named as F.O.B. will be borne by the Contractor and that ownership and title to all goods, materials, and equipment are transferred to the City when same are delivered by the Contractor to the City and the risk of loss or damage to the goods, materials and equipment transfers to the City only at such time as same are received and accepted by the City at the site named as “F.O.B.” or Delivery Site;

“GST” means the goods and services tax administered under the Excise Tax Act (Canada) and any successor tax or levy therefore in force from time-to-time;

“ITT” means this Invitation to Tender including, but not limited to: Part A - Instructions to Tenderers; Part B - General Conditions; Part C -Requirements; Part D - Tender form; Appendix 1 - Certificate of Existing Insurance; Appendix 2 - Certificate of Insurance; Appendices 3 to 5 - Detailed Equipment Specifications; any additional attachments listed in the Table of Contents;

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and any amendments, addenda, and/or clarifications pertaining to this ITT that may be issued prior to the Closing Date;

“OHS Regulation” means the *Workers Compensation Act* (British Columbia), including without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99) enacted pursuant to such Act, all as such Act or Regulations are amended or re-enacted from time to time;

“PST” means British Columbia provincial sales tax and any successor tax or levies therefor in force from time-to-time;

“Requirements” means all of the Specifications, requirements and services set out in Part C and elsewhere in the ITT that describe the general requirements that the goods, materials, equipment and services must meet and the Contractor must provide;

“Specifications” means that part of the ITT consisting of general requirements and technical descriptions of the goods, materials, equipment, standards and workmanship;

“Subcontractor” means the person or persons with whom the Contractor has made an agreement to perform a portion or portions of the Work or to supply materials or equipment therefore;

“Tender” means the Tenderer’s offer made on the Tender form set out on Part D of this ITT with all appendices or addenda submitted by the Tenderer in response to the ITT;

“Tenderer” means the individual, partnership, corporation or combination thereof, including joint venturers, who or which sign the Tender form set out in Part D of this ITT;

“Unit” means a complete generator set;

“Work” means all the labour, materials, equipment, supplies, services and other items necessary for the execution, completion and fulfilment of the Requirements;

“Work Site” means the site where the generator set will be installed.

2.0 Notices

2.1 Any notice required to be given in regards to the Contract(s) shall be given in writing and served personally or mailed by registered mail addressed to the City, to the Attention of the Manager - Supply Management and to the Contractor at the address set forth in its Tender.

3.0 Subcontractors

3.1 The City of Vancouver will not accept proposals from any contractor that will sub-contract for the work. Upon approval of any proposal and the signing of a contract, all sub-contracting, assigning or other sub-letting of the Services or Work is expressly prohibited and the successful Tenderer will not sub-contract any work without the prior written consent of the City, which consent may be arbitrarily withheld.

4.0 Independent Contractor

4.1 The Contractor, its Subcontractors, the officers, directors, shareholders, partners, personnel, affiliates and agents of the Contractor and its Subcontractors are not, nor are they to be deemed to be, partners, appointees, employees or agents of the City.

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5.0 Assignment

- 5.1 Subject to Section 5.2 of Part B - General Conditions, the Contractor will not assign, sublet, subcontract, or let out as task work any part of the Work or any of the Contractor's obligations of the Contract Documents to any third party, and will not assign or otherwise transfer any of the rights of payment under the Contract Documents to any third party, without in each case the prior written consent of the City which consent the City may arbitrarily withhold.
- 5.2 Despite Section 5.1 of Part B - General Conditions, the Contractor may utilize those Subcontractors expressly named in Section 4.1 of Part D - Tender Form but only for the Area of Responsibility set out beside their name, provided always that the Contractor may not substitute or replace those Subcontractors, or permit those Subcontractors to further assign, sub-let, sub-contract, or let out as task work their obligations under the Contract Documents, except in accordance with Section 5.1 above.
- 5.3 If the City should consent to any such assignment, subletting or letting out as task work of all or any part of the Work, the Contractor shall in no way be relieved from its responsibility for the fulfilment of the Work, but shall continue to be responsible for the same in the same manner as if all the Work had been performed by the Contractor.

6.0 Time of the Essence

- 6.1 For all requests made by the City pursuant to the Contract, time is of the essence. The acceptance of a late performance, with or without objections or reservations by the City, shall not waive the right to claim damages for such breach nor constitute a waiver of the requirement of timely performance of any obligation remaining to be performed.

7.0 Laws, Permits and Regulations

- 7.1 The laws of British Columbia shall govern the Contract.
- 7.2 All provisions of the International Sale of Goods Act are specifically excluded from application of this Contract.
- 7.3 In carrying out its obligations hereunder, the Contractor shall familiarize itself and comply with all applicable laws, bylaws, regulations, ordinances, codes, specifications and requirements of all regulatory authorities, and shall obtain all necessary licenses, permits and registrations as may be required by law.

8.0 Workplace Hazardous Materials Information System ("WHMIS")

- 8.1 The Contractor shall provide appropriate labels and material safety data sheets for WHMIS regulated products. No product containing asbestos shall be supplied at any time without written authorization from the City.

9.0 Product Standards

- 9.1 All electrical items shall comply with the relevant sections, latest editions, of versions of the Canadian Standards Association (CSA) standards C22.1-09, C22.2 No. 100-04 (for generators), C22.2 No. 178 (R2001) (for automatic transfer switch), Canadian Electrical Code (CEC), Electrical Safety Branch - BC Amendments to CEC Regulations and Bulletins, the City's Electrical Bylaw, and the National Building Code.

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10.0 Changes in Requirements

- 10.1 The City, without invalidating the Contract, may make changes to the Contract by altering, adding to or deducting from the Requirements. Subject to mutual agreement, the Contractor shall proceed with the amended Requirements, and the amended Requirements shall be executed under the provisions of the Contract.
- 10.2 The Contractor shall not make any changes from the terms of the Contract unless it shall first have received the written consent of the City, and no claims for additional compensation shall be valid unless the change was so ordered.

11.0 Delivery

- 11.1 Deliveries must be made between 8:00 a.m. and 2:00 p.m. Monday to Friday, excluding statutory holidays, unless other arrangements have been agreed in writing. A material safety data sheet (“MSDS”) must accompany all shipments containing products regulated under WHMIS legislation.

12.0 Quality of Workmanship and Materials

- 12.1 The Contractor shall perform the services with the degree of care, skill and diligence normally applied in the performance of services of a similar nature and in accordance with sound current professional practices and conforming to the requirements set out in the ITT.
- 12.2 Materials, goods and equipment shall be the products of suppliers or manufacturers of established reputation engaged in the supply or manufacture of such materials or equipment.
- 12.3 Materials are to be applied in accordance with the manufacturer’s directions and shall use the techniques and applications best suited for the type of material being used.

13.0 Inspection

- 13.1 All goods, materials, equipment and/or services are subject to inspection and approval upon delivery. The City has the right to refuse acceptance of such goods, materials, equipment and/or services that are not in accordance with the Specifications, Requirements or the Contractor’s warranty (expressed or implied).
- 13.2 Acceptance or rejection of the goods, materials, equipment and/or services shall be made as promptly as practical, but failure to inspect and accept or reject the goods, materials, equipment and/or services shall not relieve the Contractor from responsibility for such goods, materials, equipment and/or services that are not in accordance with the Contract.
- 13.3 The City shall be the final judge of all goods, materials, equipment and/or services in respect of both quality and quantity and its decisions of all questions in dispute with regard thereto will be final. Materials, goods or equipment not accepted will be returned to the Contractor at the Contractor’s expense.
- 13.4 The City will not be deemed to have accepted the goods, materials, equipment and/or services by virtue of a partial or full payment for them.

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SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART B - GENERAL CONDITIONS

14.0 Warranty

- 14.0 The Contractor warrants that the goods, materials, equipment and/or services supplied by the Contractor to the City will be in full conformity with the Specifications as well as samples, if any, then this is a sale by sample as well as by description within the meaning of the Sale of Goods Act (BC).
- 14.2 The Contractor further warrants that the goods, materials and/or equipment are of merchantable quality, and fit for the intended use and will perform according to the requirements set out in the ITT.
- 14.3 Equipment and materials shall be new, free and clear of all liens, charges and encumbrances, the latest model, and shall be complete with all necessary accessories for operation. All equipment and materials shall be at the risk of the Contractor until delivered to and accepted by the City.
- 14.4 Parts and labour warranties, as detailed in the Detailed Equipment Specifications in Appendices 3, 4 and 5, shall be provided on all goods, materials, equipment and/or services provided under the Contract.
- 14.5 The Contractor warrants that its employees have the qualifications, experience, knowledge, skills and abilities necessary for the fulfilment of the Contract.

15.0 Protection of Person and Property

- 15.1 The Contractor shall use due care that no persons are injured, no property damaged or lost, and no rights are infringed in the performance of the Requirements, and the Contractor shall be solely responsible for all loss, damages, costs and expenses in respect of any injury to persons, damage of property, or infringement of the rights of others incurred in the performance of the Requirements or caused in any other manner whatsoever by the Contractor, or its employees.
- 15.2 The Contractor shall effectively warn and protect the public and other personnel from any danger as a result of the Requirements being done.

16.0 Rectification of Damage and Defects

- 16.1 The Contractor shall rectify any loss or damage for which, in the opinion of the City the Contractor is responsible, at no charge to the City and to the satisfaction of the City. Alternatively, the City may repair the loss or damage and the Contractor shall pay to the City the costs of repairing the loss or damage forthwith upon demand from the City. Where, in the opinion of the City, it is not practical or desirable to repair the loss or damage, the City may estimate the cost of the loss or damage and deduct such estimated amount from the amount owing to the Contractor hereunder.

17.0 Clean Up

- 17.1 The Contractor shall at all times conduct the Requirements in an orderly and reasonably tidy manner, and shall at suitable intervals remove any accumulation of rubbish or refuse materials. At no time shall any person employed by the Contractor or by any of its Subcontractors discard any litter or garbage on or adjacent to the Delivery Site, except into a suitable container.

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SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART B - GENERAL CONDITIONS

18.0 Indemnification

- 18.1 The Contractor shall indemnify, hold and save harmless the City from and against all claims, losses, damages, costs, actions and other proceedings made, sustained, brought or prosecuted in a manner based upon, occasioned by or attributable to any injury, including death, property damage, infringement or damage arising from any act or omission of the Contractor, its employees, officers, volunteers, servants, sub-contractors, or agents or persons for whom the Contractor has assumed responsibility in the performance or purported performance of the Requirements.
- 18.2 The Contractor shall indemnify the City from and against any and all liability or expenses by way of legal costs or otherwise in respect of any claim which may be made for a lien or charge at law or in equity or to any claim or liability under the Builders Lien Act, or to any attachment for debt, garnishee process or otherwise.
- 18.3 The Contractor shall pay all royalties and license fees and shall save the City harmless from loss on account of suits or claims of infringement of patents in the performance of the Requirements.
- 18.4 The Contractor shall assume the defence of, and indemnify and hold harmless the City and its officers, employees and agents, from and against all claims relating to materials, goods or equipment furnished and to inventions, copyrights, trade marks, or patents and rights thereto used by the Contractor in the execution of the Contract and in subsequent use and/or operation by the City.

19.0 Termination

- 19.1 The City will advise the Contractor by written notice of its intent to terminate the whole or any part of the Contract in any one of the following circumstances:
- a) if the Contractor fails to make delivery of the goods, materials, equipment and/or services within the time specified, or fails to perform any other provisions, terms or conditions of the Contract within the time specified, or within a reasonable time if no time is specified;
 - b) in the event that the Contractor performs any act or does anything by which the City shall incur any liability whatsoever;
 - c) any failure of the Contractor to meet the safety requirements of the Contract;
 - d) in the event that any creditor of the Contractor causes a writ of execution or similar writ or court order to be served upon the City requiring the City to pay any portion due to the Contractor under the Contract; or
 - e) in the event that the Contractor is adjudged bankrupt or if it makes a general assignment for the benefit of creditors or if it becomes insolvent or if it should take the benefit of any Act that may be in force for bankrupt or insolvent debtors.
- 19.2 Upon termination of the Contract, the City shall have no obligation to the Contractor except for such goods, materials, equipment and/or services as have been supplied up to the date of the termination of the Contract(s).

INVITATION TO TENDER NO. PS09119
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19.3 Upon termination of the Contract(s) in whole or in part, the City may procure similar goods, materials, equipment and/or services and the Contractor shall be liable to the City for any excess costs for such similar goods, materials, equipment and/or services. The Contractor shall not be liable for any excess costs if failure to perform arises by reason of strikes, lockouts, Acts of God or acts of the City. The City will not be liable where Delivery Sites are not available due to strikes, lockouts or Acts of God.

20.0 Insurance Requirements

20.1 The Tenderer is advised to refer to the Certificate of Insurance [Appendix 2]. This is the type of certificate that the City would require should the Tenderer be selected as the successful Contractor.

20.2 Tenderers are to submit with their Tenders a Certificate of Existing Insurance in the form set out in the attached Certificate of Existing Insurance [Appendix 1] as evidence of their existing insurance coverage. Appendix 1 may be amended where appropriate to add the types of insurance currently carried by the Tenderer which are not explicitly referenced on the Certificate.

20.3 Without limiting any of its obligations or liabilities under the Contract, the Contractor and its Subcontractors shall obtain and continuously carry during the term of the Contract at their own expense and cost, the following insurance coverages with minimum limits of not less than those shown in the respective items set out below.

20.4 All insurance policies shall be in a form and in amounts satisfactory from time-to-time and with insurers acceptable to the City's Director of Risk Management and shall provide the City with thirty (30) days prior written notice of material change, lapse or cancellation. Notice must identify the Contract title, number, policyholder, and scope of work.

20.5 The Contractor and each of its Subcontractors shall provide at their own cost any additional insurance which they are required by law to provide or which they consider necessary.

20.6 Neither the providing of insurance by the Contractor in accordance with the requirements hereof, nor the insolvency, bankruptcy or the failure of any insurance company to pay any claim accruing shall be held to relieve the Contractor from any other provisions of the Contract Documents with respect to liability of the Contractor or otherwise.

20.7 The insurance coverage shall be primary insurance as respects the City. Any insurance or self-insurance maintained by or on behalf of the City, its officers, officials, employees, servants or agents shall be excess of this insurance and shall not contribute with it.

20.8 Prior to commencement of this Contract, the Contractor shall provide the City with evidence of all required insurance in the form of the attached Certificate of Insurance. The Certificate of Insurance shall identify the Contract title, number, policyholder and scope of work and shall not contain any disclaimer whatsoever. At all times thereafter, during the term of this Contract, the Contractor shall covenant and agree to comply with all its insurance obligations described herein. Certified copies of all insurance policies shall be made available to the City's Director of Risk Management at any time during the term of the Contract upon request.

INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART B - GENERAL CONDITIONS

20.9 The Contractor shall provide in its agreements with its Subcontractors clauses in the same form as those found herein. Upon request, the Contractor shall deposit with the City's Director of Risk Management detailed certificates of insurance for the policies it has obtained from its Subcontractors and a copy of the insurance clauses so provided in the said agreements.

20.10 The Contractor shall obtain and maintain in full force and effect during the term of the Contract, insurance not less than that set out below and provide proof of such insurance provided by a company duly registered and authorized to conduct insurance business in the Province of British Columbia.

- a) Commercial General Liability insurance in sufficient amounts and description to protect the Contractor, its Subcontractors, the City and its respective officers, officials, employees, servants and agents against claims for damages, personal injury including death, bodily injury and property damage which may arise under this Contract.

The limit of commercial general liability insurance shall be not less than five million dollars (\$5,000,000) per occurrence inclusive for personal injury, death, bodily injury or property damage and in the aggregate with respect to products and complete operations. The deductible per occurrence shall not exceed two thousand five hundred dollars (\$2,500) per occurrence.

The policy of insurance shall:

- i) be on an occurrence form;
- ii) add the City and its officials, officers, employees and agents as additional insureds;
- iii) contain a cross-liability or severability of interest clause;
- iv) extend to cover non-owned automobile, contingent employer's liability, blanket contractual liability, contractor's protective liability, broad form property damage, broad form completed operations and operations of attached machinery.

- b) The Contractor shall ensure that vehicles owned and/or operated by the Contractor in connection with the Contract maintain Third Party Legal Liability Insurance in an amount not less than five million dollars (\$5,000,000) per occurrence.

20.11 Insurance covering all risks of physical loss or damage to the equipment and all components thereof in an amount of not less than the full Contract price and which shall include a waiver of subrogation against all unissued parts and a deductible of no more than five thousand dollars (\$5,000) for each and every claim and which insurance shall terminate on safe delivery to and acceptance by the City of the equipment at the site.

21.0 WorkSafeBC Compliance

21.1 Prior to commencing any services on the City's site, the Contractor may be required to provide evidence that it is in good standing with WorkSafeBC. The Contractor is

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PART B - GENERAL CONDITIONS

responsible for having the site secured in accordance with WorkSafeBC safety regulations and ensure that no danger shall befall the public at any time during the performance of the Services.

- a) *Payment of WorkSafeBC Assessments* - The Contractor agrees that it shall at its own expense procure and carry or cause to be procured and carried and paid for, full WorkSafeBC coverage for itself and all workers, employees, servants and others engaged in or upon any work or service which is the subject of this Contract. The Contractor agrees that the City has the unfettered right to set off the amount of the unpaid premiums and assessments for such WorkSafeBC coverage against any monies owing by the City to the Contractor. The City shall have the right to withhold payment under this Contract until the WorkSafeBC premiums, assessments or penalties in respect of work done or service performed in fulfilling this Contract had been paid in full.
- b) *General WorkSafeBC Obligations* -The Contractor will have a safety program acceptable to WorkSafeBC and will ensure that all City and WorkSafeBC safety policies, rules and regulations are observed during performance of this Contract, not only by the Contractor but by all Subcontractors, workers, material suppliers and others engaged in the performance of this Contract.
- c) *Initial Proof of WorkSafeBC Registration/Good Standing* - Within five (5) Business Days of the City requesting the Contractor to do so, the Contractor will provide the City with the Contractor's and all Sub-Contractors' WorkSafeBC registration numbers.
- d) *Subsequent Proof of WorkSafeBC Registration/Good Standing* - Within five (5) Business Days of the City requesting the Contractor to do so, and concurrently with making any application for payment under this Contract, the Contractor will provide the City with written confirmation that the Contractor and all Subcontractors are registered in good standing with WorkSafeBC and that all assessments have been paid to the date of the City's request or to the date of the application for payment, as applicable.
- e) *Special Indemnity Against WorkSafeBC Non-Compliance* - The Contractor will indemnify the City and hold harmless the City from all manner of claims, demands, costs, losses, penalties and proceedings arising out of or in any way related to:
 - i) Unpaid WorkSafeBC assessments of the Contractor or any other employer for whom the Contractor is responsible under this Contract,
 - ii) The acts or omissions of any person engaged directly or indirectly by the Contractor in the performance of this Contract, and which acts or omissions are or are alleged by WorkSafeBC to constitute a breach of the WorkSafeBC OHS Regulation or other failure to observe safety rules, regulations and practices of WorkSafeBC, including any and all fines and penalties levied by the WorkSafeBC, or
 - iii) Any breach of the Contractor's obligations under this General Condition.

22.0 Character of Workers

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PART B - GENERAL CONDITIONS

- 22.1 On the written request of the City, the Contractor will remove any employee, sub-contractor or agent for any reason including but not limited to the following:
- a) lack of or failure to obtain any required Security Clearance;
 - b) intoxication;
 - c) use of foul, profane, vulgar or obscene language or gestures;
 - d) solicitation of gratuities or tips from any person for services performed under the Contract;
 - e) wilful, negligent or reckless action in disregard of safety or sanitary requirements or regulations; or
 - f) any action which may constitute a public nuisance or disorderly conduct.
- 22.2 The Contractor will immediately comply with each such request and will then provide the City with all requested documentation verifying that the employee, Subcontractor or agent has been removed from further involvement with this Contract.
- 23.0 Failure to Perform
- 23.1 Should the Contractor neglect to execute the Requirements properly or fail to perform any provision of the Contract, the City may, without prejudice to any other right or remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment due to the Contractor.
- 23.2 If the Contractor fails to perform any provision of the Contract due to reasons of strike, lockout or other work stoppages, the City may upon ten (10) days written notice to the Contractor terminate the Contract without prejudice to any other right or remedy the City may have.
- 24.0 Dispute Resolution
- 24.1 All claims, disputes or issues in dispute between the City and the Contractor shall be decided by mediation or arbitration, if the parties agree, or failing agreement, in a Court of competent jurisdiction within the Province of British Columbia and be governed by the laws of British Columbia.
- 24.2 In the event that the parties agree to arbitration pursuant to the above, the arbitration shall be governed by the rules of the British Columbia International Commercial Arbitration Centre, except that the arbitrator or arbitrators shall be agreed upon by the parties, and failing agreement by the parties, shall be appointed by a court of competent jurisdiction within the Province of British Columbia.
- 24.3 In the event that the parties agree to arbitration, the arbitration shall take place in the Lower Mainland, British Columbia and be governed by the laws of British Columbia.
- 24.4 The procedure set out in this section is not meant to preclude or discourage informal resolution of disagreements between the City and the Contractor.
- 25.0 Payments

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- 25.1 The Contractor shall be paid net thirty (30) days from receipt of invoice and acceptance of the goods, materials, equipment and or services, whichever is the latter.
- 26.0 Taxes
- 26.1 Unless otherwise provided herein, the Contractor shall pay all sales or excise taxes in force during the term of the Contract, provided that any increase or decrease in such taxes shall increase or decrease the amount due under the Contract.
- 26.2 Invoices shall show the appropriate amounts for GST and PST.
- 27.0 Non-resident Withholding Tax - Intentionally Omitted
- 28.0 No Promotion of Relationship
- 28.1 The Contractor must not disclose or promote its relationship with the City, including by means of any verbal declarations or announcements and by means of any sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials without the express prior written consent of the City (except as may be necessary for the Contractor to perform the Contractor's obligations under the terms of the Contract). The Contractor undertakes not to use "VANOC", "Vancouver 2010", the official emblem, logo or mascot of the 2010 Games or any reference or means of promotion or publicity, without the express prior written consent of the City. Furthermore, the Contractor undertakes not to disclose or promote its relationship with the City in any communication or manner whatsoever as a basis to create an association, express or implied, between the Contractor and the IOC, the Olympics or the Olympic Movement.
- 29.0 Commencement of Warranty Period
- 29.1 The warranty period shall commence at the time the City puts the equipment (the "Unit") into service, or three (3) months after acceptance of the Unit, whichever is sooner.
- 29.2 The City will notify the Contractor of the date that the Unit goes into service.
- 29.3 The warranty should be made out to the City of Vancouver, 453 West 12th Avenue, Vancouver, BC, V5Y 1V4.
- 30.0 Required Documentation
- 30.1 The following documentation shall accompany each Unit at time of delivery. Failure to include all or some of the listed documents will delay the City's acceptance of the Unit:
- a) Copy of the commercial invoice;
 - b) Owner service policy and warranty; and
 - c) Shop drawings as specified in Appendix 5, Section 1.5 Submittals;
- 30.2 The City of Vancouver address shown on the documentation should read the same as the Delivery Site address set out on the purchase order.

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SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART B - GENERAL CONDITIONS

31.0 Plant Production Limitations

- 31.1 If any Unit ordered under the Contract cannot be manufactured because of plant production limitations, the City reserves the right to purchase the current replacement model at a revised price.
- 31.2 The revised price shall be based on a percentage adjustment based on (i) the published manufacturer's retail/list prices at the time of the Tender and (ii) the first published manufacturer's retail/list prices for the next model year.
- 31.3 The Contractor shall notify the Manager - Supply Management in writing if such a production situation occurs, and shall submit with the letter of notification, comparative manufacturer's retail lists supporting the proposed revision(s).

32.0 Delays or Failure to Conform To Specifications

- 32.1 Liquidated Damages for Late Delivery or failure to conform to Detailed Equipment Specifications:
 - a) If the Contractor fails to deliver the Unit to the Work Site by the Delivery Date as set out in Part C Requirements, Section 3.1 as may be adjusted pursuant to the provisions of the Contract Documents, or if the Unit should fail to function or fail to conform to the Detailed Equipment Specifications or to Part C - Requirements resulting in any delays whatsoever to the project schedule including start up, commissioning, testing, and training then the City may deduct from any monies owing to the Contractor for the Work:
 - i) as a genuine pre-estimate of the City's increased costs for delay of sequential construction tasks, an amount of \$1000.00 per day or pro rata portion for each calendar day that delivery of the Unit is achieved after the Delivery date or that the Unit fails to function or perform as called for in the Detailed Equipment Specifications; plus
 - (ii) all direct out-of-pocket costs such as costs for safety, security, or equipment rental, reasonably incurred by the City as a direct result of such delay or failure to perform or to function as called for in the Detailed Equipment Specifications.
- 32.2 If monies owing to the Contractor are less than the total amount of liquidated damages owed by the Contractor to the City under (a) above then any shortfall shall immediately, upon written notice from the City, be due and owing by the Contractor to the City.

33.0 Safety

- 33.1 In addition to Part B - General Conditions - Section 21 - WorkSafeBC Compliance the Contractor will be responsible for the health and safety of all the Contractor's and Sub-Contractors' staff that report to it, either directly or indirectly. The Contractor will comply with the City's health and safety program and Transfer & Landfill Operations Site Safety requirements as outlined in Appendix 6.

INVITATION TO TENDER NO. PS09119
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PART C - REQUIREMENTS

1.0 Scope of Contract

The Vancouver Landfill (the "Landfill"), located in Delta at 5400 72nd Street, is owned and operated by the City of Vancouver. The Landfill serves over 1,000,000 residents of Vancouver, Delta, Richmond, White Rock, University Endowment Lands and parts of Surrey. The Landfill is authorized to receive 750,000 tonnes of municipal solid waste annually. The future development strategy for the Landfill is to fill higher within the existing footprint for approximately 40 more years.

Leachate is the product of water percolating through refuse and is collected in a double ditch system around the perimeter of the Landfill. The inner ditch collects leachate, while the outer ditch collects clean water that runs off adjacent land. Water in the outer ditch is maintained at a higher elevation, creating a net water inflow towards the inner ditch, so leachate is contained within the inner ditch. Ditches flow by gravity to the pump station at the southwest corner of the site. Leachate is transported from the pump station through a force main to Annacis Island Wastewater Treatment Plant.

The scope of work for the Pump Station Controls Upgrade Project includes the supply and installation of specialized equipment and construction work to upgrade to the control system and standby power for the leachate pump station. The purpose of the upgrade is to minimize the potential for failure of the systems during emergency operations. Stantec Consulting Ltd (the "Consultant") was retained in March 2008 to provide Professional Services including detailed design and construction supervision for this project.

The Project work will be broken up into 3 separate tender packages to minimize delivery time for the specialized equipment and ensure the project schedule is met:

- .1) General Contract, to include the overall coordination of the project as Prime Contractor, site preparation, provision of electrical and communication connections, installation of piping/valves/instruments, installation of the equipment provided by other 2 tender packages, and supply of a pre-engineered building to house all control equipment.
- .2) Generator Supply, to include the manufacture, delivery and commissioning of a diesel generator in a weatherproof enclosure, including generator controls and all accessories, a fuel tank, and an automatic transfer switch.
- .3) Motor Control Center (MCC) and Control Panel Supply, to include the supply of an MCC and Control Panel, as well as conducting start up, commissioning and training.

Construction must be completed by November 1, 2009 at the latest, based on the need for dry weather to complete equipment installation, start-up and commissioning.

An overview of the scope of the Supply and Delivery of a Diesel Generator and ATS as required by this ITT is provided separately below.

2.0 Requirements

The Supply and Delivery of the Diesel Generator and Automatic Transfer Switch (ATS) work is to include, but is not limited to;

- a) Supplying the specified diesel generator, automatic transfer switch, fuel tank, enclosure, all accessories and connections;

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SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART C - REQUIREMENTS**

- b) Delivering the equipment to the site and mounting on the designated pad; and
- c) Conducting generator start up, commissioning, and training.

Detailed specifications are set out in Appendices 3 to 5. The Diesel Generator is referred to in the detailed specifications as the 'Genset'. Tenders shall clearly indicate any deviations from the equipment specifications set out therein.

3.0 Delivery

- 3.1 The City requires that the delivery of the generator and all accompanying components be co-ordinated with the successful Tenderer for the General Contract ITT for the Project. It is anticipated that delivery of the Generator will be required on or before September 30, 2009.
- 3.2 The City of Vancouver may designate alternate delivery to the Work Site in phased stages.
- 3.3 There will be a need for the Contractor to coordinate with others for delivery access to the Work Site and for commissioning and training activities. The Tenderer is required to work together with the City and other contractors to resolve any coordination issues that may arise as a result of these activities.
- 3.4 The Contractor shall be required to obtain an appointment to deliver the Products to the Work Site and delivery should be between the hours of 8:00 A.M. and 2:00 P.M. Monday to Friday.
- 3.5 Address of the Vancouver Landfill:

Vancouver Landfill
5400-72nd Street
Delta, BC

Attention: General Contractor - as determined through the General Contract ITT.

The Contractor shall deliver the Products to the Work Site and put them in place on the designated concrete pad prepared by the successful Tenderer for the General Contract ITT.

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PART D - TENDER FORM**

Tenderer's Name: _____
"Tenderer"

Address: _____

Telephone: _____ Fax: _____

Key Contact Person: _____

E-mail: _____ Incorporation Date: _____

Attach additional pages immediately behind this page for sub-contractors, if applicable.

To the City of Vancouver,

The undersigned Tenderer, having carefully read and examined the ITT including the Instructions to Tenderers, General Conditions, Special Conditions, Requirements, Specifications and all addenda and having full knowledge of the Requirements described herein, does offer to provide the goods, materials, equipment and/or services in accordance with the Specifications, terms and conditions set out in the ITT (except as noted herein) and in accordance with the pricing set out in the Tender form.

Required Documents:

Description	Required	Received
Certificate of Existing Insurance	Yes	
Bid Bond	Yes	
Undertaking of Surety	Yes	
Shop Drawings	No	

If the above documents do not accompany the Tender at the time of opening, the Tender may be put aside and given no further consideration.

To be Initialled at Tender Opening:

Manager, Supply Management or designate

Witness

**INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART D - TENDER FORM**

1.0 References

1.1 The following is a list of references for similar goods, materials, equipment and/or services supplied by the Tenderer to other clients. The Tenderer agrees that the City may contact these references at its discretion. In addition, the City may also contact any other organization for the purposes of evaluating the Tenderer's company and Tender.

Name and Address of Company	Contact Name and Telephone Number	Brief Description of Work and Date Performed

2.0 Schedule of Price and Quantities

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total Price per Item</u>
1.0	Generator				
1.1	Supply of a Complete Diesel Engine Generator Set (Genset)	1	each	\$	\$
1.2	Supply of a Sub-base Fuel Tank for the Genset	1	each	\$	\$
1.3	Supply of a Weatherproof Sound Attenuating Enclosure for the Genset	1	each	\$	\$
1.4	Supply of a Complete 1000 Amp 600 Volt Transfer Switch	1	each	\$	\$
1.5	Delivery of the Transfer Switch to the Designated MCC Supplier	N/A	Lump Sum	N/A	\$
1.6	Delivery of the Genset to Site and Installation on Site	N/A	Lump Sum	N/A	\$
1.7	Setup Testing and Commissioning	N/A	Lump Sum	N/A	\$
1.8	All training and final documentation	N/A	Lump Sum	N/A	\$
1.9*	Extend warranty to 5 years	N/A	Lump Sum	N/A	\$
	Sub-Total				\$
				GST	\$
				Total Tender Price	\$

* The City will decide prior to the award of the Contract whether to include these optional items in the Contract.

**INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART D - TENDER FORM**

Note: PST and GST are not included in these prices

3.0 Delivery Schedule

3.1 To be delivered to the Work Site:

Quantity of Units	Type of Unit	Delivery Date	Comply (Yes/No)
1	Generator Set	September 30, 2009	
1	Conducting generator start up and commissioning	November 1, 2009	
1	Training	November 1, 2009	

4.0 Subcontractors

4.1 Subcontractors to be used in the performance of the Contract are listed below. (If no Subcontractors will be used, indicate "Not Applicable").

Company Name, Address	Contact Name	Telephone No.	Area of Responsibility

INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART D - TENDER FORM

5.0 Tenderer's Declaration

The undersigned Tenderer confirms that it has read and agreed to the conditions stated in the ITT and that any deviations have been clearly noted herein.

The Tenderer agrees that if this Tender is accepted within sixty (60) calendar days from the Closing Time, the undersigned Tenderer agrees to supply the City of Vancouver with all or any part of the items upon which prices are stated, at the price set opposite each item and to deliver the same at the designated point or points within the time specified, and in accordance with the Terms and Conditions set forth in the Tender.

Authorized Signatory for the Tenderer

Date

Name and Title (*please print*)

6.0 Acceptance of Tender

ACCEPTANCE

Date of Acceptance _____

The City hereby accepts the Tender for the supply and delivery of the goods, materials, equipment and/or services described herein or that portion of the goods, materials, equipment and/or services set out below at the prices and on the Terms and Conditions set forth in the Tender:

City of Vancouver by its authorized signatory:

INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART D - TENDER FORM

SCHEDULE "A"

CONSENT OF SURETY

ITT PS09119 SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH.

Should it be required, we the undersigned Surety Company do hereby consent and agree to become bound as sureties in an approved Contract Performance Bond in the amount of one hundred percent (100%) of the awarded Total Tender Price for the fulfillment of the CONTRACT and for the performance of the Work as described herein, which may be awarded to _____ at the price set forth in the attached Tender, which Performance Bond we understand are to be filed with the City of Vancouver within five (5) Business Days of receipt of Notice of Award of the CONTRACT.

We hereby further declare that the undersigned Surety Company is legally entitled to do business in the Province of British Columbia and that it has a net worth over and above its present liabilities and the amounts herein set forth.

The Common Seal of _____

was hereto affixed in the

presence of:

INVITATION TO TENDER NO. PS09119
SUPPLY AND DELIVERY OF DIESEL GENERATOR AND AUTOMATIC TRANSFER SWITCH
PART D - TENDER FORM

SCHEDULE "B"

TENDERER'S PROPOSED VARIATIONS

The Tenderer should make a full and complete statement and description of any changes or variations it proposes in the Specifications for the Work as set out in the Tender Documents, if any.

Additional pages may be attached to this page and/or separate numbered documents such as specifications, descriptive literature and drawings may be submitted with this Schedule "B". Each such additional page and/or separate document will be clearly marked "Invitation to Tender No. PS09119, Supply and Delivery of Diesel Generator and Automatic Transfer Switch, Part D - Form of Tender - Schedule "B" - Tenderer's Proposed Variations", with the name of the Tenderer indicated and each additional page initialed on behalf of the Tenderer.



**CERTIFICATE OF EXISTING INSURANCE
TO BE COMPLETED AND SUBMITTED ALONG WITH TENDER**

Section 2 through 8 - to be completed by the Insurer or its Authorized Representative

1. THIS CERTIFICATE IS ISSUED TO: City of Vancouver, 453 W 12th Avenue, Vancouver, BC, V5Y 1V4
And certifies that the insurance policy (policies) as listed herein has been issued to the Named Insured and is in full force and effect as of the effective date of the agreement described below.

NAMED INSURED *(must be the same name as the proponent/bidder and is either an individual or a legally incorporated company)*

BUSINESS TRADE NAME or DBA DOING BUSINESS AS

BUSINESS ADDRESS

DESCRIPTION OF OPERATION

3. PROPERTY INSURANCE (All Risks Coverage including Earthquake and Flood)

INSURER _____	Insured Values (Replacement Cost) -
TYPE OF COVERAGE _____	Building and Tenants Improvement \$ _____
POLICY NUMBER _____	Contents and Equipment \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

4. COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)

Including the following extensions:

<input checked="" type="checkbox"/> Personal Injury	INSURER _____	_____
<input checked="" type="checkbox"/> Property Damage including Loss of Use	POLICY NUMBER _____	_____
<input checked="" type="checkbox"/> Products and Completed Operations	POLICY PERIOD _____	From _____ to _____
<input checked="" type="checkbox"/> Cross Liability or Severability of Interest	Limits of Liability (Bodily Injury and Property Damage Inclusive) -	
<input checked="" type="checkbox"/> Employees as Additional Insureds	Per Occurrence	\$ _____
<input checked="" type="checkbox"/> Blanket Contractual Liability	Aggregate	\$ _____
<input checked="" type="checkbox"/> Non-Owned Auto Liability	All Risk Tenant's Legal Liability	\$ _____
	Deductible Per Occurrence	\$ _____

5. AUTOMOBILE LIABILITY INSURANCE for operation of owned and/or leased vehicles

INSURER _____	Limits of Liability -
POLICY NUMBER _____	Combined Single Limit \$ _____
POLICY PERIOD From _____ to _____	<i>If vehicles are insured by ICBC, complete and provide Form APV-47.</i>

6. UMBRELLA OR EXCESS LIABILITY INSURANCE

INSURER _____	Limits of Liability (Bodily Injury and Property Damage Inclusive) -
POLICY NUMBER _____	Per Occurrence \$ _____
POLICY PERIOD From _____ to _____	Aggregate \$ _____
	Self-Insured Retention \$ _____

7. PROFESSIONAL LIABILITY INSURANCE

INSURER _____	Limits of Liability
POLICY NUMBER _____	Per Occurrence/Claim \$ _____
POLICY PERIOD From _____ to _____	Aggregate \$ _____
	Deductible Per Occurrence/Claim \$ _____

If the policy is in a "Claims Made Form", please specify the applicable Retroactive Date: _____

8. OTHER INSURANCE

TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____
TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER _____ Dated _____



CERTIFICATE OF INSURANCE

Section 8 b) - to be completed by City staff. Select # of days Written Notice is required.
 Section 2 through 7 - to be completed by the Insurer or its Authorized Representative

1. THIS CERTIFICATE IS ISSUED TO: City of Vancouver, 453 W 12th Avenue, Vancouver, BC, V5Y 1V4
And certifies that the insurance policies as listed herein have been issued to the Named Insured(s) and are in full force and effect as of the effective date of the agreement described below.

2. NAMED INSURED: *(must be the same name as the Permittee/Licensee or Party(ies) to Contract and is either an individual or a legally incorporated company)*

MAILING ADDRESS: _____

LOCATION ADDRESS: _____

DESCRIPTION OF OPERATION, CONTRACT, AGREEMENT, LEASE, PERMIT OR LICENSE: _____

3. PROPERTY INSURANCE naming the City of Vancouver as a Named Insured and/or Loss Payee with respect to its interests (All Risks Coverage including Earthquake and Flood)
 INSURED VALUES: (Replacement Cost)
 INSURER: _____ Building and Tenants Improvement: \$ _____
 TYPE OF COVERAGE: _____ Contents and Equipment: \$ _____
 POLICY NUMBER: _____ Deductible Per Loss: \$ _____
 POLICY PERIOD: From _____ to _____

4. COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)
 Including the following extensions: LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)
 Personal Injury Per Occurrence: \$ _____
 Products and Completed Operations Aggregate: \$ _____
 Cross Liability or Severability of Interest All Risk Tenant's Legal Liability: \$ _____
 Employees as Additional Insureds Deductible Per Occurrence: \$ _____
 Blanket Contractual Liability
 Non-Owned Auto Liability
 INSURER: _____
 POLICY NUMBER: _____
 POLICY PERIOD: From _____ to _____

5. AUTOMOBILE LIABILITY INSURANCE for operation of owned and/or leased vehicles
 INSURER: _____ LIMITS OF LIABILITY:
 POLICY NUMBER: _____ Combined Single Limit: \$ _____
 POLICY PERIOD: From _____ to _____ *If vehicles are insured by ICBC, complete and provide Form APV-47.*

6. UMBRELLA OR EXCESS LIABILITY INSURANCE LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)
 INSURER: _____ Per Occurrence: \$ _____
 POLICY NUMBER: _____ Aggregate: \$ _____
 POLICY PERIOD: From _____ to _____ Self-Insured Retention: \$ _____

7. OTHER INSURANCE (e.g. Boiler & Machinery, Business Interruption, Crime, etc.) - Please specify Name of Insurer(s), Policy Number, Policy Period, and Limit

8. POLICY PROVISIONS:
Where required by the governing contract, agreement, lease, permit or license, it is understood and agreed that:
 a) *The City of Vancouver, its officials, officers, employees, servants and agents have been added as Additional Insureds with respect to liability arising out of the operation of the Named Insured pursuant to the governing contract, agreement, lease, permit or license;*
 b) *SIXTY (60) days written notice of cancellation or material change resulting in reduction of coverage with respect to any of the policies listed herein, either in part or in whole, will be given by the Insurer(s) to the Holder of this Certificate; the exception is cancellation for non-payment of premiums in which case the applicable statutory conditions will apply;*
 c) *The insurance policy (policies) listed herein shall be primary with respect to all claims arising out of the operation of the Named Insured. Any insurance or self-insurance maintained by the City of Vancouver shall be in excess of this insurance and shall not contribute to it.*

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE _____ Dated: _____

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER _____

PART 1 GENERAL (SECTION 16010)

1.1 General

- .1 This section covers General requirements of the supply of a complete Stand-by Generator and Automatic Transfer Switch for the City of Vancouver Leachate Pumping Station.
- .2 Owner shall mean the City of Vancouver or it's appointed representative.
- .3 Engineer shall mean Stantec Consulting or their appointed representative.
- .4 The word "supply" as used in these specifications shall be taken to mean that so noted equipment is to be purchased, assembled and shipped to the site. The supplier of the equipment is responsible to confirm functionality of the equipment at site prior to the commissioning of the system. Where an item is noted as supplied by the City, by others, or by another division, the work of mounting, connecting and commissioning the item shall be included in the contract unless specifically otherwise noted.
- .5 The word "provide" as used in these specifications shall be taken to mean that the so noted equipment is to be supplied, mounted, connected, adjusted, commissioned and placed into service.
- .6 The word "approved" as used in these specifications shall be taken to mean that so the noted equipment is to be approved by the Engineer prior to fabrication.
- .7 The word "install" means all work and material necessary to place the specified item into full operation, securely fastened and to give a presentable finished appearance. "Install" also includes all necessary connections, conductors, ducts, wireways and conduits.
- .8 The word "coordinate" as used in these specifications shall be taken to mean to make all arrangements directly with agencies and individuals, confirm schedules, be in attendance at the time work is carried out, take full responsibility for having the work carried out correctly and in timely manner to meet the construction schedule.
- .9 The term "field wiring" as used in these specifications shall be taken to mean all work necessary to connect from the supplied equipment to other systems and equipment not supplied under this contract.
- .10 The Contractor shall be ultimately responsible and shall provide for the supply, certification, adjustment and start-up, of a complete, coordinated system that shall reliably perform the intended functions.
- .11 Except where otherwise noted the Contractor shall make all system power and electrical signal connections to all components equipment and systems supplied under this contract:
 - a) For each digital input check complete circuit by actually operating the source device or instrument and confirming that the signal is received at the appropriate input.
 - b) For each analog input check operation of the complete circuit by actually operating the source device or instrument, or where this can not be done due to process conditions by connecting a loop calibrator at the field end (instrument position) and confirm that the signal is received at the appropriate input. Where possible, vary the signal through its full range.
 - c) Provide completed records of all factory tests.

- .12 The Contractor shall ensure that:
- a) All control panels, devices, instruments, wiring, and other components to be provided by the Contractor under this section are properly installed and interfaced and perform properly as an integrated unit.

1.2 Codes and Standards

- .1 As referenced in other sections.

1.3 Compliance

- .1 Failure to comply with the specifications shall be cause for rejection and the contractor shall be required to make good at no additional cost to the Owner or their agents.
- .2 Where a conflict exists between any applicable code, regulation, directive, standard or manufacturers recommended practice for any item and what is shown on drawings or specified, seek clarification from the Engineer prior to submitting tender or allow for the most expensive alternative.

1.4 Work Included

1. Work shall be in accordance with the specifications and shall include all materials, labor, tools, and equipment required for a complete and operational installation. Any equipment, connections, conductors, or installation, material not specifically mentioned, but clearly required to furnish complete and operational systems shall be provided as if specifically detailed. Where there is conflict between specifications or details in the specifications or if additional information is required, obtain clarification from engineer before submitting tender. If clarification is not requested allow for the most expensive alternatives.
2. The contract price shall include but not be limited to the following:

Supply, delivery, testing, startup and commissioning of a complete diesel generator set complete with separate automatic transfer switch with controls, weatherproof sound attenuating housing, sub-base fuel tank, fuel tank monitoring, engine and generator control panel, exhaust system with muffler, starting batteries and 120 volt battery charging equipment, and fire suppression system, all as described and specified in the related sections of this specification.

1.5 Submittals

- .1 Provide submittals to fully describe and detail the equipment being supplied.
- .2 Specifically, the Contractor shall submit at time of tender the following material:
- a) Catalogue information, descriptive literature, wiring diagrams, and engineered shop drawings on generator, automatic transfer controllers, indicators, primary elements, instruments and measuring equipment and appurtenances, fuel tank exhaust system battery and charger fuel tank monitoring fire suppression, and all other components of the System.
 - b) Individual data (or specification) sheets shall be provided for all components provided under this section. The purpose of these data sheets is to supplement the generalized catalogue information provided by citing all specific features for each specific component (e.g. scale range, materials of construction,

- special options included, etc). Each component data sheet shall bear the component name and instrument tag number designation shown in Specifications.
- c) Catalogue information on all electrical devices furnished under this section.
 - d) Shop drawings including complete instrumentation manuals technical specifications and catalogue material for the equipment. Complete assembly and layout drawings to scale.
 - e) Interconnecting point-to-point wiring diagrams, showing all component and panel terminal board identification numbers and external wiring numbers. These diagrams shall include all intermediate terminations between field elements and panels, and 120 VAC power supply circuits.
- .3 The Contractor shall provide a Component Part List. The Component Part List shall be a complete parts list for the entire Process Instrumentation and Control system, and shall have the following features:
- a) All components shall be grouped by component type, with the component types identified in a similar manner to the component identification code used in these Specifications.
 - b) All components shall be listed with their exact and complete manufacturer's part number, including all options or accessories.
 - c) All components shall be identified with their complete tag number as shown in these Specifications, or as modified or assigned by the Contractor and approved by the Engineer.
 - d) All components without tag numbers shall be grouped within component types by manufacturer's part number. Exact quantities shall be listed for each part number.
- 1.6 Operation And Maintenance (O&M) Manuals
- .1 Provide installation, operation and maintenance manuals on all equipment designated for shop drawings.
 - .2 Provide four sets of original documents, bound in a hard cover three ring binder each with a table contents, dividers and tabs.
 - .3 Originals and good quality photocopies equal to the original are acceptable.
 - .4 The Operation and Maintenance Manuals shall include, but not be limited to, the following: installation instructions; maintenance and overhaul instructions; procedures for start, operation and shut-down of all equipment and systems, complete wiring and control diagrams; other equipment; safety precautions; diagrams and illustrations; manufacturer's name and catalog data; test procedures; name and address of authorized service organization and parts distributor for all material and equipment installed and contractor's name, address and phone number.
 - i) Make allowance for instruction of 15 or more designated personnel.
 - .5 Hand written notes are not acceptable.

- .6 Provide instruments and equipment manufacturer's installation and user manuals. Data sheets and brochures are not acceptable.
- .7 At the beginning of each section of O&M manual provide a table to indicate instruments and equipment tag numbers, part numbers and calibration information.
- .8 Record all commissioning settings in the manual.
- .9 Provide a Table of Contents for each O&M manual binder. Each tab shall be described in detail in the Table of Contents.
- .10 If repair or replacement parts lists are available, these are to be included as part of this manual.

1.7 Permits, Costs And Inspection

- .1 Obtain all necessary permits and pay associated costs.

1.8 Guarantee / Warranty

- .1 The contractor shall guarantee/warrant all equipment of his supply and replace at his expense any part which may fail or prove defective within a period of twelve months after final acceptance.

1.9 Voltage Ratings

- .1 Operating voltages: to CAN3-C235-83, plus all equipment must operate reliably on power supplied by B.C. Hydro, which is within B.C. Hydro's acceptable operating guidelines.

1.10 Materials and Equipment

- .1 Equipment and materials to be CSA certified or have equivalent electrical certification as accepted in British Columbia.
- .2 Where there is no alternative to supplying equipment that is not certified, as specified, obtain special approval from Electrical Inspection Department.
- .3 Equipment supplied shall be of the manufacturer's latest design and shall produce or be activated by signals that are established standards.

1.11 Painting and Finishes

- .1 Electrical equipment shall be finish painted, scratch-proof, heat and fuel and oil resistant.
- .2 Paint colour shall be manufacturer's standard colors.
- .3 Where touch-up or repainting is required, use paint obtained from the equipment manufacturer, exactly matching the original finish.

1.12 Equipment Identification

Identify electrical equipment with name plates and labels as follows:

- .1 Nameplates:
 - a) Lamacoid 3 mm thick plastic engraving sheet, black face, white core, mechanically attached with self tapping screws unless noted otherwise.

Nameplate Sizes

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 line	6 mm high letters

- b) Wording on nameplates to be approved by Engineer prior to manufacture.
- c) Allow for average of twenty-five letters per nameplate.
- d) On instruments, controlled devices and other equipment provide clearly legible engraved or stamped permanent stainless steel tag, fastened with stainless steel cable or other Engineer approved means.
- e) Identification to be English.
- f) Disconnects and contactors: indicate equipment being controlled and voltage.
- g) Terminal cabinets and pull boxes: indicate system and voltage.
- h) Transformers: indicate capacity, primary and secondary voltages. .

1.13 Wiring Identification

- .1 Identify wiring with permanent indelible markings, either numbered or colored plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and color coding throughout.
- .3 Color coding to C22.1-09.
- .4 All wires shall be identified by approved type wire markers. Submit proposed cable numbering for review by the Engineer before commencing the installation.
- .5 Phase termination's shall be red, black, blue and wiring changes to obtain proper rotation shall be made at end devices, i.e. motors.
- .6 Provide cable identifications as follows:
 - a) All cables shall be tagged with markers showing the complete cable numbers at locations as follows:
 - i) Cables entering starters, panels 1 marker immediately above (or below) glanding plate or cabinet bottom.
 - ii) In addition to the above 1 marker at point where cables enter starters.
 - b) All control conductors of all cables shall be marked with the complete wire number at both ends.
 - c) All wire shall be identified by thermoplastic PVC sleeve type wire markers.

- d) Wire markers shall be the individual interlocking type assembled to compose the wire number or a continuous tubular sleeve type custom hot stamped with wire number.

1.14 Wiring Termination

- .1 All wires are to be terminated on approved lugs or terminal blocks suitable for copper conductors.

1.15 Delivery

- .1 The generator and all accessories are to be delivered to site. The transfer switch is to be delivered to a location designated by the Engineer within the Greater Vancouver District. Put the generator in place on site at the Landfill on the concrete pad constructed by others next to the new electrical and control building. All wiring will be done by others. Delivery time is critical and is to be coordinated with the City of Vancouver Project Manager. Provide storage of the complete equipment in the supplier facilities, at no additional cost, until the site is ready to receive the equipment.
- .2 Insure the equipment and pay any costs associated with claims, until the equipment is in place at the site.

1.16 Installation of Equipment

- .1 Provide all labor and all necessary equipment including timbers, scaffolding, tools and rigging materials for installation of the equipment.
- .2 The contractor shall be responsible for coordinating all mechanical, electrical and other works for the equipment being installed.
- .3 All instrumentation and equipment shall be provided with all required mounting hardware to mount the device according to the mounting requirements indicated in the individual device specification or the device user manual.
- .4 The instrumentation and control equipment provided under this Contract shall be installed in accordance with the manufacturer's instructions, the applicable installation standards, and any related requirements of the Contract Documents in a manner that will ensure satisfactory operation upon completion.

1.17 Care, Operation and Start-up

- .1 Providing and connecting of the load conductors, power supply to the battery charger and block heater/ circulating water heater, and the interconnection between the transfer switch and the Genset control panel will be done on site by the General Contractor. Provide complete commissioning of the Generator and Transfer Switch on site in the presence of the Engineer and provide final reports showing all final settings and the results of measurements and any data recorded taken during the commissioning.
- .2 Instruct the owners representatives in the operation, care and maintenance of equipment.

END OF SECTION 16010

**DETAILED EQUIPMENT SPECIFICATIONS
AUTOMATIC TRANSFER SWITCH (ATS)**

APPENDIX 4

ITT NO. PS09119

In the AUTO position the engine will be started, and the switch automatically transfer to “emergency”, if the “normal” line power supply should fail (this will occur independent to pump calling). Following the restoration of power the switch will retransfer to “normal” and shut down the engine.

In the SYST.TEST position a “normal” line power supply failure condition shall be simulated.

- .8 The automatic transfer switch shall conform to the requirements of NEMA Standard ICS 2-447 and Underwriters' Laboratories UL-1008, shall be CSA listed and approved by B.C. Hydro.
- .9 Approved Manufacturers: Thomson Technology Inc, Asco Electric

2.2 Finishes

- .1 Apply finishes in accordance with Section 16010.

2.3 Equipment Identification

- .1 Provide equipment identification in accordance with Section 16010.
- .2 Nameplates for major components and front panel controls and indicators.
 - .1 Lamacoid black plate, white letters, Size 5.

PART 3 EXECUTION

3.1 Installation

- .1 Provide ATS ready and complete with all components and accessories for installations into a standard depth MCC section.
- .2 Connect normal source, standby generator set source, grounding, load supply, Gen-set control panel and Pumping Station control panel override to the transfer switch as indicated on drawings.
- .3 In normal operation the transfer switch shall monitor the “normal” utility power for loss of any or all phases. When loss of power or a phase(s) occurs the transfer switch is to command the generator to start, wait until generator voltage and frequency are correct and stable, then transfer the load onto the generator feed. On restoration of normal power the transfer switch shall wait for an adjustable period of time, and then transfer the load to the normal feed. The transfer switch shall then allow the generator to run for an adjustable “cool down” period then signal the generator to shut down. If normal power is off and the generator shuts down the transfer switch is to remain in the “Generator” position until one of the sources returns.
- .4 Check factory-made connections for mechanical security and electrical continuity.
- .5 The complete automatic transfer switch shall be commissioned on site by the supplier to ensure proper operation of the individual components and correct overall sequence of operation, and to ensure that the operating transfer times, voltage, frequency, and time delay settings meet the operating requirements of the pumping station and are in compliance with the specification requirements.

END OF SECTION 16437

DETAILED EQUIPMENT SPECIFICATIONS
STANDBY GENERATOR

APPENDIX 5

ITT NO. PS09119

PART 1 GENERAL SECTION 16600)

1.1 DESCRIPTION OF SYSTEM

- .1 The diesel generator unit, also referred to as a gen-set is to be provided complete with all required accessories, connected, adjusted, tested, commissioned by the manufacturer, and certified ready for service by the contractor. The unit is to be a minimum of 800 kW, but must be sized to operate the loads detailed below within the performance criteria specified. Units excessively oversized are not acceptable.
- .2 The gen-set system shall include but not be limited to:
 - a) Diesel engine.
 - b) Alternator.
 - c) Engine control panel (ECP).
 - d) Battery charger and battery.
 - e) Cooling system.
 - f) Fuel supply system, including sub base fuel tank to store sufficient fuel for 24 hours of full load operation.
 - g) Exhaust system.
 - h) Weatherproof and silencing lockable enclosure for the gen-set to be mounted on reinforced concrete base.
 - i) Fire suppression system inside weather-proof enclosure.
- .3 System designed to operate automatically as standby power source for unattended operation.
- .4 For the purpose of gen-set sizing, the loads to be handled shall be assumed as follows:
 - a) 1 x 280HP, 3 phase pump; 1 x 147HP, 3 phase pump ;1 x 47HP, 3 phase pump; plus a 30Kva transformer feeding lighting, heating, pump station control system and other miscellaneous loads. The unit is to be 3 phase, 4 wire, 600/347 volt, 60Hz. The supplier is to verify that the supplied unit is rated for the above loading, plus an additional 15% capacity.
- .5 The gen-set is to be equipped with extra quiet noise attenuating housing and critical, residential grade muffler and exhaust system. All designed for Vancouver area seismic conditions.
- .6 The gen-set enclosure is to be painted with an exterior high grade fade resistant powder coat paint finish, light grey.
- .7 The contractor is to provide all fluids required, including coolant, lubricants, and sufficient fuel for all testing plus 8 hours of running time at 75% load.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings as a package, to enable the Engineer to review the system in its entirety. Shop drawings must be for the specific unit which is being supplied. Drawings or information, which shows multiple options, will not be accepted unless the information which applies for this specific unit is clearly highlighted or marked.

- .2 Include:
- a) Engine: make and model, with performance curves; DIN 6270 standard rating of engine.
 - b) Alternator: make and model.
 - c) Continuous full load output of set at 0.8 PF lagging.
 - d) Voltage regulator: make, type and functional description.
 - e) Battery: make, type and capacity.
 - f) Battery charger: make, type, model and functional description.
 - g) Engine control panel: make and type, schematic diagram and component details. Layout drawing drawn to scale. Drawings to be complete with information for temperature, pressure, time delay, trip current and similar settings or value.
 - h) Governor type and model.
 - i) Ventilation system.
 - j) Fuel system details.
 - k) General arrangement of standby plant with outline dimensions and including such details as location of power connections and fuel tank and filter details.
 - l) Description of set operations including:
 - m) Starting instructions.
 - n) Automatic shut down and alarm features.
 - o) Full details of the weather enclosure.
 - p) A plotted chart with the generator damage curve, overload relay curve, generator breaker curve, and generator sustained short-circuit curve.
 - q) Voltage/time curve for the transient condition as described in another clause of this Specification entitled Voltage Regulator.

1.3 OPERATION AND MAINTENANCE DATA

- .1 Provide operation and maintenance data for the gen-set for incorporation into Operation and Maintenance Manual.
- .2 Include in Operation and Maintenance manual instructions for the specific unit supplied and not a general description of units manufactured by supplier and:
- a) Operation and maintenance instructions for engine, alternator, control panel, battery charger, battery fuel system, ventilation and cooling system, exhaust system and accessories, to permit effective operation, maintenance and repair.
 - b) Technical data:
 - i) Illustrated parts lists with parts catalogue numbers.
 - ii) Schematic diagram of electrical controls.
 - iii) Certified copy of factory test results.
 - iv) Maintenance and overhaul instructions and schedules.

DETAILED EQUIPMENT SPECIFICATIONS
STANDBY GENERATOR

APPENDIX 5

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- v) Precise details for adjustment and setting for time relays or sensing controls which are required on-site adjustments.
- vi) Copies of shop drawings.

1.4 MAINTENANCE MATERIALS

- .1 Provide maintenance materials.
- .2 Include as a minimum:
 - a) One complete set of belts.
 - b) One year's supply of oil and fuel filters (based in 10 run hours per month and a minimum of one complete oil change.)
 - c) Oil lubricant and radiator fluids for first scheduled maintenance change
 - d) Special tools for unit servicing.
 - e) Electrical items:
 - i) Five control fuses of each type in use.
 - ii) Two pilot light lamps of each type in use.
 - iii) Two control relays and timer relays of each type in use.

1.5 QUALITY CONTROL

- .1 Shop test generator set including engine, alternator, control panel and accessories.
- .2 Notify Engineer five working days in advance of date of shop test; Engineer reserves the right to witness the shop test.
- .3 Test procedure:
 - a) Prepare blank forms and check sheet with spaces to record data. At top of the first sheet record:
 - i) Date.
 - ii) Generator set serial number.
 - iii) Engine, make, model, serial number.
 - iv) Alternator, make, model, serial number.
 - v) Voltage regulator, make and model.
 - vi) Rating of generator set, kW, kVA, V, A, r/min, HZ.
 - vii) Case temperature around generator bearings prior to heat run.
 - viii) Stator temperature by resistance method, prior and after heat run.
 - b) Mark check sheet and record data on forms in duplicate as test proceeds.
 - c) Signature of supplier's technician on completed forms to certify results of test.
- .4 Tests:
 - a) Perform an 8 hour test run consisting of a 1-hour warm up period during which gen-set is loaded in four equal steps to 100% of rated capacity followed by a 7-hour full load heat run.

- b) During heat run, take readings at 30-minute intervals, and record following:
 - i) Time of reading.
 - ii) Running time.
 - iii) Ambient temperature in °C.
 - iv) Lube oil pressure in kPa.
 - v) Lube oil temperature in °C.
 - vi) Engine coolant temperature in °C
 - vii) Bearing temperature.
 - viii) Generator stator temperature.
 - ix) Alternator voltage.
 - x) Alternator amperage.
 - xi) Power in kW.
 - xii) Frequency in kW.
 - xiii) Power Factor.
 - xiv) Battery charger current in A.
 - xv) Battery voltage.
 - xvi) Alternator stator temperature in °C.

- c) After completion of 8 hour run, conduct:
 - i) Operational test of alarm and control circuits. Create actual fault conditions such as low pressure, high-water temperature, overcrank, and overspeed in order to check out and verify the calibration of the safety shutdown devices.
 - ii) Adjustment of battery charger to suit the battery supplied.
 - iii) Verification that the battery can sustain the cranking cycles in the event of an overcrank situation.
 - iv) Operational test of battery charger.
 - v) The bearing temperature shall stabilize within 4 hours of the start of the heat run.
 - vi) Record governor full-load/no-load regulation.

- d) Site Test and Operator Training
 - i) Following full testing of the gen-set after connection to the pump station, run unit for 2 hours during which time the City's designated personnel shall be instructed in the operation and maintenance of all supplied equipment.
 - ii) The Contractor is to supply the fuel required during this time.

1.6 WARRANTY

- .1 For the diesel engine driven generator set, the warranty period shall be not less than 48 months or 1500 operating hours, whichever occurs first.

**DETAILED EQUIPMENT SPECIFICATIONS
STANDBY GENERATOR**

APPENDIX 5

ITT NO. PS09119

1.7 CODES AND STANDARDS

- .1 Except where specified otherwise, provide systems in accordance with CSA C22.1-09, C22.2 No. 100-04 (for generators), C22.2 No. 178 (R2001) (for automatic transfer switch), and as amended for use in the Province of British Columbia, henceforth also referred to as the Rules and Regulations.
- .2 Abbreviations for electrical terms: to CSA Z85.

1.8 CARE, OPERATION AND START-UP

- .1 Instruct operating personnel in the operation, care and maintenance of equipment.
- .2 Provide the services of a qualified technician to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

1.9 VOLTAGE RATINGS

- .1 Operating voltages: to CAN3-C235.

1.10 PERMITS, FEES AND INSPECTION

- .1 Affix CSA or equivalent label on equipment or furnish Certificates of Acceptance from B.C. Provincial Electrical Inspection Department and authorities having jurisdiction where required on completion of work to Engineer.
- .2 Pay associated fees.

1.11 MATERIALS AND EQUIPMENT

- .1 Materials and equipment shall be new and of highest quality and shall be suitable for the purpose they are intended for.

1.12 FINISHES

- .1 With the exception of the weatherproof housing which is to be finished as specified in this section, shop finish metal surfaces with heavy duty, high quality coating inside and out applied in shop. Coating system:
 - a) Commercial (SSPC-SP-6) sand blast of all surfaces.
 - b) One coat of primer CGSB1-GP-48M.
 - c) Two coats of Exterior Enamel Manufacturer's standard colours.
- .2 Colour scheme:
 - a) Exterior of weather enclosure - light grey.
 - b) Interior of weather enclosure - light grey.
 - c) Engine, alternator, exterior of control panel and appurtenances - to manufacturer's standard colour.
 - d) Interior of control panel - white.

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- .3 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint. If touchups can not be restore the equipment to like new condition, repaint the entire unit.
- .4 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.
- .5 Apply Galvacon touch-up paint to damaged portions of galvanized threads and surfaces.

1.13 EQUIPMENT IDENTIFICATION

- .1 Identify equipment with engraved nameplates made from 2-ply, 3 mm thick plastic sheet, black face, white backing, mechanically attached with self tapping screws. Foam-tape 3M Scotch-Mount No. 4032 adhesive backing acceptable where used inside a control panel.

1.14 WIRING

- .1 Wiring to be stranded copper conductors with insulation of no less than RW90 X/L insulation.
- .2 Identify control wires with permanent, indelible numbered markings on both ends of wires, i.e. at all points of terminations and splices.
- .3 Maintain phase sequence and colour coding throughout.
- .4 Colour code: to CSA C22.1-09 and as follows:
 - a) Power wires: phase A-B-C from left to right, red-black-blue
 - b) Neutral: white
 - c) AC, control: red
 - d) AC, ground green
 - e) DC, control conductor yellow for ungrounded conductor, brown for grounded conductor

Taping for the purpose of colour coding will not be accepted for conductors less than #2 AWG.

1.15 WIRE TERMINATIONS

- .1 Lugs, terminals, screws used for termination of wires to be suitable for copper and aluminum conductors.

1.16 APPROVED SUPPLIERS

- .1 Approved suppliers, subject to compliance with the specified requirements are, in alphabetical order:
 - a) Cummings Onan Ltd
 - b) Frontier Equipment Ltd
 - c) Finning Power Products.

2.1 DIESEL ENGINE

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- .1 Diesel engine: to ISO 3046/1.
- a) Engine: standard product of current manufacturer, from company regularly engaged in production of such equipment.
- .2 Two or four-cycle, naturally aspirated or turbo charged and after-cooled synchronous speed 1800 r/min, vertical in-line or V-type.
- .3 Capacity:
- a) Rated continuous power in kW at 1800 r/min, after adjustment for power losses in auxiliary equipment necessary for engine operation; to be calculated as follows:
- $$\text{Rated continuous output} = \frac{\text{Generator kW}}{\text{Generator Efficiency @ full load}}$$
- b) Under following site conditions:
- i) Altitude: 100 m.
- ii) Ambient temperature: 35°C.
- iii) Relative humidity: 100%
- .4 Cooling System:
- a) Liquid cooled: heavy duty industrial radiator mounted on generating set base with engine driven pusher type fan to direct air through radiator from engine side. Thermostatically controlled, with initial fill of ethylene glycol anti-freeze non-sludging above minus 40°C.
- b) Water pump: engine-mounted cooling water circulating pump.
- c) Cooling lines: Flexible connections using heavy-duty, fabric-reinforced rubber hose with double stainless steel clamps at each end.
- d) To maintain manufacturer's recommended engine temperature range at 10% continuous overload in ambient temperature of 40°C.
- e) Block heater: thermostatically controlled lube oil or liquid coolant heater, connected to 120 VAC circuit to maintain engine work and in start-ready state.
- f) Air filter engine-mounted, dry-type, complete with replaceable element and enclosure.
- .5 Fuel: No. 2 domestic burner oil.
- .6 Fuel system:
- a) Solid injection, engine-mounted, positive displacement, mechanical fuel pump with hand primer, primary and secondary fuel filters and air cleaner with replaceable elements, fuel rack solenoid energized when engine running.
- b) Fuel filters to be as manufactured by Raycor.
- .7 Governor: Electronic type, electric actuator, speed droop externally adjustable from isochronous to 5%, temperature compensated with steady state speed maintenance

capability of plus or minus 0.25%, and no load to full load regulation of plus or minus 1.5%.

- .8 Lubrication System:
- a) Pressure lubricated by engine driven positive displacement pump.
 - b) Lube oil filter: replaceable, full-flow type, removable without disconnecting piping. Spring-loaded bypass valve to ensure oil circulation in the event filter becomes clogged.
 - c) Lube oil cooler, water-cooled, engine-mounted.
 - d) Engine sump drain valve.
 - e) Oil level dip-stick.
 - f) Lube oil drain valve inside weather enclosure, with hose extension to the outside of the weather enclosure for convenient oil change.
- .9 Starting System:
- a) Positive shift, gear engaging starter 12 V dc.
 - b) Cranking limiter to provide cranking cycle consisting of three cranking periods of approximately 10 s duration, each separated by 5 s rest.
 - c) Lead acid, 12 V storage battery with non-metallic rack, of sufficient capacity to crank engine for six full cranking cycles.
 - d) Battery charger: automatic, constant voltage type suitable for permanent connection to the engine battery normally charged by the engine-mounted alternator when the engine is running, suitable for connection to a 120 V ac supply, with the following features: power-on indicating light, automatic current limiting to protect charger and battery, input and output protection, fast charge if the state of the battery demands it, automatic change to trickle charge once the battery becomes fully charged with automatic equalizing feature.
- .10 Automatic safety devices that will signal the control panel to stop the engine in the event of:
- a) Low-lubricating oil pressure.
 - b) High-water temperature.
 - c) Overspeed.
 - d) Overcrank.
 - e) Low coolant level.
 - f) Additional safety devices may be provided at the option of the manufacturer.
- .11 Vibration isolated engine instrument panel with:
- a) Lube oil pressure gauge.
 - b) Lube oil temperature gauge.
 - c) Coolant temperature gauge.
 - d) Tachometer.

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- .12 Guards to protect personnel from hot and moving parts. Locate guards so that normal daily maintenance inspections can be undertaken without their removal.
- .13 Galvanized steel oil pan, directly under the engine, sized large enough to retain 100% of the total system's oil capacity.
- .14 Crank case ventilation pipe to exterior of weather enclosure.
- .15 Air box drain on turbocharged units.
- .16 Manifold:
 - a) Insulate exhaust manifold with factory-applied, high temperature, high-performance, removable insulation.
 - b) If applicable, insulate turbocharger in similar fashion.
- .17 Engine Wiring:
 - a) Wire engine-mounted devices to the ECP.
 - b) Conductors on engine, stranded copper with 105°C rated insulation, run in fuel and oil-resistant sleeves suitable for high temperature application.
 - c) Identify each control conductor external to the ECP with a discrete wire number corresponding to the information on the wiring diagram.

2.2 ALTERNATOR

- .1 Alternator: to NEMA MG1.
- .2 Output voltage:
 - a) 347/600 V, 3 phase, 4 wire, 60 Hz.
 - b) Alternator neutral isolated from frame and brought out for connection.
 - c) Size: As required to meet the specified load and voltage drop requirements. The information to be submitted on the Data Sheet will be critical in evaluating the suitability of the equipment being offered.
 - d) Output at 40°C ambient: 100% full load continuously.
 - e) Revolving field, brushless, single anti-friction bearing.
 - f) Drip proof.
 - g) Amortisseur windings.
 - h) Synchronous type.
 - i) Dynamically balanced rotor direct coupled to engine. Dynamically balanced with no damaging torsional vibration between $\pm 25\%$ rated speed.
 - j) Exciter: rotating brushless, static.
 - k) EEMAC Class H insulation on windings with a temperature rise of 130°C measured by resistance.
 - l) Voltage regulator: automatic, static type mounted in engine control panel.
 - i) Stability: 1% maximum voltage variation at any constant load from no load to full load.

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- ii) Regulation: not more than $\pm 2 \frac{1}{2}$ % voltage variation when the generator rated maximum load at 0.8 to 1.0 power factor is slowly applied or taken off with a $\pm 2 \frac{1}{2}$ % change in speed.
- iii) Transient: not to vary by more than 20% of rated voltage, measured by oscilloscope, and return to and stay within the above-mentioned $+2 \frac{1}{2}$ % range within 3 seconds when the specified loads are applied.
- iv) For a description of the loads, refer to another clause of this specification entitled System Description.
- v) Voltage regulation rheostat to manually adjust the voltage controlled by the automatic regulator, mounted in the ECP.
- vi) Locate rheostat inside panel to reduce tampering by unauthorized personnel.
- vii) Alternator: capable of sustaining a sufficiently high current for a period required to permit selective tripping of down line protective devices when a short circuit occurs.

2.3 ENGINE CONTROL PANEL (ECP)

- .1 Totally enclosed, EEMAC Type 12, formed and welded from 2.7 mm (12-gauge) sheet steel, mounted on generator frame with vibration dampers, and visible through shatter-proof glass window in the weather-proof enclosure.
- .2 Panel door with formed edges and pocket for schematic drawings.
- .3 Generously sized for the equipment to be mounted in ECP.
- .4 Flexible conductors between door and fixed panel. Provide space of no less than 230 mm to make field wiring connections.
- .5 Controls and Features:
 - a) Provide the control functions described below through use of relays only or a combination of relays and solid-state circuitry.
 - b) Autocranking cycles consisting of repeated crank periods followed by rest periods. These periods time adjustable with cranking limiter to terminate cranking if the engine does not start within 90 seconds.
 - c) Provide a START-STOP selector switch for the engine on the ECP.
 - d) Provide a generator circuit breaker which will properly protect the generator in the event of overload and under short circuit conditions. This may be achieved in a number of ways such as through use of an adjustable magnetic only trip, backed up by inverse - time magnetic overload relays, or by a systems - type circuit breaker with adjustable settings for both, overload and short circuit protection, or by whatever the manufacturer has adopted to achieve the task of protecting the generator. Proper system protection must be documented as specified in another clause of this specification entitled shop drawings.
 - e) Provide the following alarms:
 - i) High jacket water temperature.
 - ii) Low-oil pressure.
 - iii) Overcrank.

- iv) Overspeed.
 - v) Low-fuel level. (adjustable set point)
 - vi) Low coolant temperature. (indicates block heater failure)
 - vii) Battery charger trouble.
 - viii) Fail to start alarm.
- f) Alarm circuits reset manually by local push button or similar means.
- g) Each of the above alarms indicated by individual red lights and, except for the fuel alarms, to shutdown and lock out the engine. If necessary, provide time delays to prevent nuisance shutdown of engine during start-up cycle; e.g., on high-water temperature, after the engine has been stopped normally, but is still hot.
- h) For a description of the high/low battery voltage alarm, refer to another clause in this Specification entitled battery Voltage Sensor.
- i) Other features to be provided in ECP:
- i) Voltmeter, indicating generator output voltage, connected between the generator and the generator breaker; meter to read phase and phase-neutral voltages.
 - ii) Ammeter indicating generator output current; meter to read each phase.
 - iii) Ammeter and voltmeter phase-selector switches.
 - iv) Frequency meter.
 - v) Rheostat to adjust generator output voltage, located inside the panel to reduce unauthorized tampering.
 - vi) Elapsed time meter, indicating accumulated generator running time.
 - vii) A red LED light for GENERATOR BREAKER OPEN. This light controlled from an auxiliary contact on the breaker and connected to the battery-supplied dc circuit.
 - viii) A white LED light for GENERATOR POWER AVAILABLE, connected between generator and the generator breaker.
 - ix) Automatic voltage regulator.
 - x) Battery charger; optionally, at the discretion of supplier may be housed in it's own separate enclosure, complete with accessories specified.
 - xi) Voltmeter, indicating battery voltage; optionally, may be located on engine instrument panel.
 - xii) Ammeter, indicating battery charger output current.
 - xiii) Ammeter, indicating charging alternator current.
 - xiv) Battery voltage sensor.
- j) Solid State Controllers:
- i) Specifically designed for this task.
 - ii) Self-contained modular design suitable for mounting in control panel door.

- iii) Internally protected.
 - iv) LED status and fault-indicators on face plate.
 - v) All adjustments front-accessible and clearly labelled.
 - vi) Connection to external wiring through plug-in connector.
- k) Switchboard Instruments:
- i) For generator output; 1% accuracy-class for:
 - Voltage.
 - Amperage.
 - Frequency, scale 55-65 Hz.
 - Acceptable manufacturers: Crompton Instruments Ltd., Series 077; Yokogawa, Model AB-40.
 - ii) For dc circuits 2% accuracy-class.
- l) Battery Voltage Sensor:
- i) Provide a sensor to detect high and low-battery voltage under load condition. Circuits or sensors which monitor the battery charger's output voltage only, are not acceptable. Setpoints continuously adjustable between 10 and 30 V dc. Time delays to ignore momentary surges or dips as may occur, e.g., during engine cranking. High and low-voltage conditions indicated with separate SPDT 10 A, 120 V rated contacts wired to terminal blocks.
 - ii) Provide two red LED pilot lights: one for HIGH and one for LOW battery voltage on the ECP. Lights to be manual reset.

2.4 PUSHBUTTONS

- a) Heavy duty, oiltight.
- b) Contact rating EEMAC A600 (a.c.), P600 (d.c.)
- c) Operator colour coding; green for start, red for stop, black for reset, others as selected by panel builder.
- d) Operator style: flush for start and reset, extended for stop, mushroom head for emergency stop, others as selected by panel builder.
- e) Contact arrangements to suit control requirements.

2.5 SELECTOR SWITCHES

- .1 Heavy duty, oiltight.
- .2 Contact rating EEMAC A600 (a.c.), P600 (d.c.).
- .3 Maintained, spring return, 2, 3 or multiple position as required.
- .4 Operator style: standard, unless otherwise required.
- .5 Contact arrangement to suit control requirements.

2.6 PILOT LIGHTS

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- .1 Heavy duty oiltight, push-to-test type with LED lamps, nominal 30 mm size. A master 'lamp Test' button is acceptable as an alternative to push-to-test lights.
- .2 Ac type to be transformer type.
- .3 Lens colours: green for running, amber for stop, red for failure.
- .4 LED style acceptable where part of a printed circuit board or manufacturer's standard module.
- .5 Pilot lights and LED indicators must be visible without the need to open the control panel door or the weather-proof enclosure and must be clearly visible in daytime daylight conditions.

2.7 ELAPSED TIME METERS

- .1 Commercial case, not less than 52 mm square or round.
- .2 Calibrated in hours, minimum 6-digit.
- .3 Suitable for door-mounting.
- .4 Non-reset type.
- .5 Acceptable products: Bauser Type 621 or 623, Hengstler Type 2045.1, Engler Type 10NL7.

2.8 PLUG-IN SOCKETS

- .1 Applicable to plug-in relays and timers.
- .2 Front-wired with binding head screw terminals.
- .3 Heavy-duty industrial type.
- .4 Provision for relay retaining clip or hold-down spring.

2.9 CONTROL RELAYS

- .1 Unless otherwise noted, use plug-in relays. If contact requirements exceed 3 NO/NC contacts use fixed-type relays with field convertible contacts.
- .2 Plug-in relays, heavy duty, encapsulated type with indicating lamp across coil for relay status.
- .3 DPDT relay with octal-pin base, 3 PDT relays with 11-pin base.
- .4 Relay contacts rated 230 VAC, 10 A resistive, 6 A inductive.
- .5 Acceptable products: Potter & Brumfield Type KRP-N, Releco, Model C, Omron Model MK.

2.10 TIMING RELAYS

- .1 Unless otherwise noted, use plug-in timer relays.

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- .2 Plug-in relays, heavy duty, encapsulated type with indicating lamp across coil for relay status.
- .3 DPDT relay with octal-pin base, 3 PDT relays with 11 pin base.
- .4 Relay contacts rated 230 VAC, 10 A resistance, 6 A inductive.
- .5 Acceptable products: Potter & Brumfield Type KRP-N, Releco, Model C, Omron Model MK.

2.11 TIMING DELAYS

- .1 Unless otherwise noted, use plug-in solid state timer relays.
- .2 Construction: plexi-encapsulated with solid-state timing circuit.
- .3 Operation: on-delay or off-delay as indicated.
- .4 Supply voltage: as indicated.
- .5 Timing range: as indicated.
- .6 Output contact rating: 230 VAC, 10 A resistance, 6 A inductive.
- .7 Overall accuracy: Not less than $\pm 5\%$.
- .8 Repeat accuracy: not less than $\pm 2\%$.
- .9 Acceptable products: Agastat Series SSC, Potter & Brumfield; Type CD, SSAC Series TRM (on-delay), TRB (off-delay) with time tolerance "Z", SSAC Series TDM or TDB, Omron Model H3BA.
- .10 For heavy inductive load switching of up to 1/3 HP or 345 VA at 120/240 VAC, use Agastat Series SCB.

2.12 PANEL WIRING

- .1 Stranded copper, minimum No. 16 AWG.
- .2 Insulation Type TEW, 105°C for conductors 10 AWG, and smaller. Type RW90 X/L for conductors larger than 10 AWG.
- .3 Colour coding, refer to Part 1.
- .4 Run wires in plastic wiring duct wherever possible. Bundle and tie wires neatly where not run in wiring ducts and hold with mechanically attached fastening tabs; self-adhesive tabs not acceptable.
- .5 Use insulated compression spade lugs to terminate conductors on binding head screws. Crimping die as per manufacturer's instructions.
- .6 Group ac- and dc- wires separately from each other.

2.13 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Part 1.

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2.14 EQUIPMENT MOUNTING

- .1 Readily accessible for servicing, maintenance and adjustments.
- .2 Generally the space between the wiring ducts and the terminations shall be 50 mm or greater.

2.15 STRUCTURAL STEEL MOUNTING BASE

- .1 Complete generating set mounted with vibrations isolations on structural steel sub-base fuel tank of sufficient strength and rigidity to protect assembly from stress or strain during transportation, and under operating conditions.

2.16 EXHAUST SYSTEM

- .1 Heavy duty, residential grade, horizontally mounted exhaust silencer, Silex Series JD or as approved, with condensate drain, plug and flanged or threaded couplings. Specified sound attenuation to be met.
- .2 Fittings and accessories as required, including pipe expansion provision.
- .3 Exhaust silencer mounted so that its weight is adequately supported. Exhaust to vent vertically.
- .4 Counter balanced raincap.
- .5 Exhaust piping Schedule 40S stainless steel pipe with forged stainless steel welding fittings. Exhaust to be discharged through the side of the weather enclosure.
- .6 Thermal Insulation; See Clause 2.19.
- .7 Support exhaust piping from structural members of the weather enclosure as required

2.17 FUEL STORAGE AND LINES

- .1 Provide flexible fuel line connections on the supply and return lines using heavy-duty reinforced hose with threaded swivel end fittings suitable for diesel fuel. Provide a shutoff cock at each end.
- .2 Provide a full tank of diesel fuel in the tank for start-up and test purposes.
- .3 Fuel Tank:
 - a) Provide double wall monitored sub-base fuel tank to meet all fuel storage safety, environmental and fire regulations. Leakage alarm to provide isolated 120 VAC rated dry contact output for remote monitoring.
 - b) ULC approved, sized to permit full load operation of the gen-set for a minimum of 24 hours.
 - c) Provide:
 - i) Readily accessible fill connection.
 - ii) Vent connection.
 - iii) Fuel supply connection.
 - iv) Fuel return connection.

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- v) Low level alarm switch.
 - vi) Valved tank drain connection through the tank bottom. Install drain to the outside of the weather enclosure, locate valve inside the enclosure. Draw and fill to be configured to facilitate fuel polishing.
 - vii) Level gauge; General Filter GF-100, or as approved.
- .4 Level switch to be manufacturer's standard, connected to meet the requirements described in another clause of this Specification entitled Controls and Features.
- .5 Terminate fill and vent connection on the inside of the weather enclosure. Provide a cap and insect screen for the fill and vent connections, respectively.

2.18 WEATHERPROOF ENCLOSURE

- .1 Generously sized to house gen-set complete with fuel tank, control panel (ECP) and all appurtenances. The generator set shall be provided with a sound-attenuated housing which allows the generator set to operate at full rated load in the ambient conditions previously specified. The enclosure and the exhaust system described in 2.16 above shall reduce the sound level of the generator set while operating at full rated load to a maximum of 68 dBA at any location 7 meters from the generator set in a free field environment. Acoustical materials used shall be oil and water resistant. No foam materials shall be used unless they can be demonstrated to have the same durability and life as fiberglass.
- .2 The enclosure shall include hinged doors for access to both sides of the engine and alternator, and the control equipment. Key-locking and padlockable door latches shall be provided for all doors. Door hinges shall be stainless steel.
- .3 The enclosure shall be provided with an exhaust silencer which is mounted inside of the enclosure, and allows the generator set package to meet specified sound level requirements. Silencer and exhaust shall include a raincap and rainshield.
- .4 All sheetmetal shall be primed for corrosion protection and finish painted with the specified color. All surfaces of all metal parts shall be primed and painted. The enclosure shall have smooth lines to present neat, streamlined contours. The roof shall be slightly sloped for rain water run-off.
- .5 Rigid, self-supported, weather-protective, insulated, reinforced sheet metal enclosure with ventilation intake and discharge louvres manufactured from minimum 2.7 mm (12 Ga) sheet steel.
- .6 Hinged doors all around to give full unobstructed access to equipment. Hinges to have brass pins and bullet hinges with weather caps. Lockable with gas shock type, door-stay devices which holds door in fully open position. Minimum 12.7 mm diameter hole to be drilled in each door latch for installation of pad locks by The City. Individual doors maximum 1100 mm wide.
- .7 Fixed, vandal-resistant, louvred vents with bird screen made from minimum 1.8 mm (14 Ga) aluminum for intake and discharge louvres.
- .8 Protective shielding around exhaust muffler and pipe, both inside and outside weather enclosure. See Clause 2.19: Thermal Insulation.
- .9 Weather enclosure and gen-set structural steel base to be bolted together to form an integral unit.

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- .10 Provide a 120 VAC, 15 A duplex receptacle and a fluorescent light or lights with wire guards to give reasonably even illumination over the generator and control panel area.
- .11 Provide an outside weatherproof, swivelled spotlight to facilitate field work. The light shall be detachable for storing inside the weather enclosure.
- .12 120 VAC receptacle and light circuits shall be obtained from the generator output.
- .13 Construct reinforced concrete base, suitably sized, in accordance with details for the electrical kiosk base.

2.19 THERMAL INSULATION

- .1 Scope: Insulate and clad exhaust pipe and muffler from engine manifold to exit point at exterior wall.
- .2 Materials: Pre-formed sectional pipe insulation, non-friable hydrous calcium silicate to match applicable pipe diameter.
- .3 Standards:
 - a) CAN/CGSB 51-GP-2M.
 - b) MIL-1-2781E to 650°C.
 - c) MIL-1-24244A.
 - d) Fire hazard classification - ASTM E84.
 - e) Flame spread 0; smoke developed 0.
- .4 Physical properties:
 - a) Density: 208kg/m³
 - b) Compressive strength: 1360 kPa for 5% compression.
 - c) Linear shrinkage: 1.1% after 24 hours soaking period at 650°C.
 - d) Maximum service temperature: 815°C.
- .5 Thermal conductivity: 0.076 W/m °C at 260°C mean temperature.
- .6 Insulation thickness: 200 mm diameter and smaller exhaust pipe: 50 mm.
- .7 Fastenings: AISI Type 304 stainless steel, soft annealed wire, 1.2 mm diameter.
- .8 Insulation cement: to CAN/CGSB 51-GP-2M.
- .9 Use stainless steel or aluminum jackets as specified below:
 - a) Stainless steel to AISI Type 304.
 - i) Construction:
 - Pre-formed to fit outside diameter of insulation.
 - 0.2 mm thick with preformed interlocking "Z" longitudinal joints, 50 mm end laps.
 - ii) Closure bands:

- Stainless steel to AISI Type 304.
- 0.2 mm thick precast and preformed to outside jacket diameter.
- Complete with factory installed, high temperature, non-setting sealing compound in each exterior lip of inside surface for water seal.

b) Aluminum alloy:

- i) Crimped or embossed. 0.4 mm thick, with longitudinal slip joints and 50 mm end laps, with factory attached protective liner on interior surface with aluminum alloy butt straps with mechanical fasteners.
- ii) Aluminum alloy jackets for fittings to have die-shaped components.

.10 Application:

- a) Apply insulation after all tests have been completed and approved by Engineer.
- b) Insulation and surfaces to be clean and dry during installation and during application of finishes.
- c) Apply insulation and finishes in accordance with manufacturer's recommendations and as specified herein.

END OF SECTION 16600



VANCOUVER LANDFILL SAFE WORK PROCEDURE

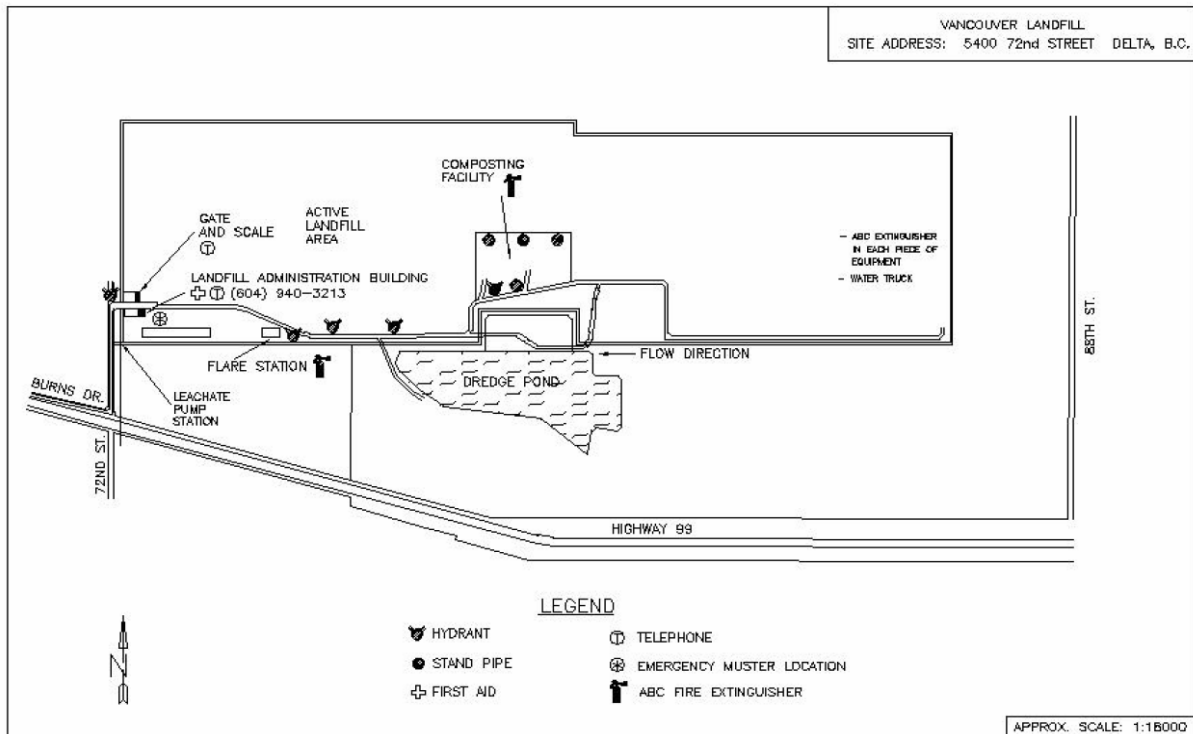
Developed or Revised (most recent date): Sept 2008
 Next Scheduled Review / Revision: Sept 2009

SITE SAFETY ORIENTATION / AGREEMENT

The City of Vancouver, Transfer & Landfill Operations Branch requires that all persons working on the Vancouver Landfill (VLF) site receive the following orientation before any work is to begin. The orientation includes an outline of general safety issues, working alone, emergency and first aid procedures, protocols for working near heavy equipment and personal protective equipment requirements. All individuals, understand, agree to comply with, and sign this document in order to have access to or do work on this site.

Sections

1. General Safety Issues
2. Working Alone
3. In The Event of an Emergency
4. First Aid
5. Heavy Duty Equipment
6. Personal Protective Equipment
Legal Terms and Conditions
Statement of Responsibility





VANCOUVER LANDFILL SAFE WORK PROCEDURE

1. GENERAL SAFETY ISSUES
 - The speed limit on the Landfill premises is 30 km/h (20 mph).
 - Smoking anywhere on the site is prohibited.
 - Scavenging is prohibited.
 - The use of cellular phones is not permitted while operating vehicles/equipment. Always move to a safe place out of the way of any equipment or vehicles prior to using a cellular phone or engaging in any other non-mobile activity.
 - All drivers/operators must observe traffic control measures (i.e. stop signs and cones).
 - Be aware of and stay clear of coned off areas. These are to protect you from any hazards.
 - Seatbelts must be worn at all times while vehicles are in motion.
 - Be aware that asbestos is routinely managed at the Landfill. Stay upwind of any yellow bags at the Landfill face.
 - All support workers must sign in and out by completing the "Visitor Sign-in Sheet" located at the Landfill Administration office during regular hours or at the Scalehouse after hours.

2. WORKING ALONE
 - Must sign in and out at the Landfill Administration office and advise reception staff they will be working alone.
 - Have reception staff assign a personal ID number (0010, 0020 or 0030).
 - Follow attached procedures for accessing the Safetyline Mobile Worker Monitoring System.

3. IN THE EVENT OF AN EMERGENCY
 - Report any fires, spills, accidents or other emergencies to the Landfill office immediately (604.940.3213). In the event of an emergency that requires outside assistance, call 911 immediately. The Landfill Manager is responsible for contacting additional authorities as required.
 - Report any health & safety accidents and/or near-miss incidents to the Landfill Office.
 - Your first priority is to warn others and evacuate the immediate area. Do not put yourself in danger.
 - If not directly and helpfully involved, report to the Emergency Assembly Location at the east side of the Landfill Administration building.
 - Do not return to the site until instructed that it is safe.
 - Material Safety Data Sheets are located in Superintendents office.

4. FIRST AID
 - The first aid room is located at the southeast corner of the Landfill Administration building.
 - For emergencies, call 911 (dial "9" first from landlines).
 - Notify the designated First Aid Attendant at 604.603.1655 (VLF First Aid Cell Phone). If no answer, contact the Landfill office at 604.940.3213 to alert the First Aid Attendant.

5. HEAVY EQUIPMENT
 - Do not walk in the active tipping area of the Landfill.
 - Do not move into the vicinity of any vehicle until you have made eye contact with the operator/driver and ensured that he/she is aware of your presence.
 - Do not, at any time, walk behind any piece of heavy equipment. Unless absolutely necessary, remain outside of the swing radius of excavators, approximately 15 metres (50 feet).



VANCOUVER LANDFILL SAFE WORK PROCEDURE

- Always maintain a safe distance between trucks (one truck and trailer length) in the demolition dumping area. End dump style demolition trucks pose an extreme hazard of tipping over on its side when the box is lifted in the air.
 - Remember that people are more mobile than equipment - it is your responsibility to stay out of the way.
 - All equipment must be turned off before fueling.
6. PERSONAL PROTECTIVE EQUIPMENT (PPE)
- The following are necessary while on the site:
 - WCB approved Hi- visibility reflective vest or coveralls.
 - WCB approved safety protective footwear ((heavy-duty, above the ankle, construction-type safety boots with an external triangular green CSA patch). Boots should also be approved as shock-resistant when working on electrical systems (display an external white Ω CSA patch).
 - Also necessary where appropriate:
 - Respirators as per WCB requirements.
 - Hard hats as per WCB requirements.
 - Hearing protection as per WCB requirements.
 - Safety glasses and/or masks as per WCB requirements.
 - Fall protection in situations where a fall of 3 metres (10 feet) or more could occur, or from a lesser height but which represents a higher risk of injury.
 - Other specific equipment where determined necessary or by regulation for the particular situation.
 - Always observe and follow Lockout and Confined Space Entry procedures (when applicable).



**VANCOUVER LANDFILL
SAFE WORK PROCEDURE**

PROCEDURES FOR USING THE SAFETYLINE MOBILE WORKER MONITORING SYSTEM

Users log in to the SafetyLine IVR system at the start of working alone, at assigned intervals during the work, and at the end of working alone. Users, in consultation with their supervisor, should determine the interval period for checking in. The default interval is 60 minutes and may need to be shorter depending upon the risks of the particular task. Users without a personal ID/password will have one assigned by Landfill Reception staff.

To log-in to the SafetyLine IVR system, the user will:

1. phone SafetyLine at **604.299.6266**
2. enter the company ID **51#**
3. enter **personal ID** (as assigned) and #
4. enter **password** (same as ID) and #

The system will respond with a voice message “*not system monitored*”.

Support Workers will need to enter their cell phone number by:

1. press **0** (Advanced Menu)
2. press **6**, enter your cell phone number then press #
3. press **1** (to confirm the phone number)
4. press ***** to exit to the main menu

To start system monitoring, all users will need to press **2**, record a voice message stating your work location, then # to report ok and * to exit.

To check-in during the work, log in to the system as above and at the voice prompt, enter **2** and #. If your work location has changed, record a new voice message.

To log-out at the end of work, log in to the system as above and at the voice prompt, enter **5** and #; you will hear “*Thank you for using SafetyLine*”.

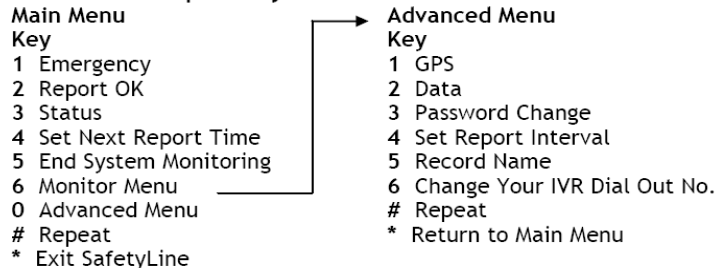
Note: these sequences can be programmed using the speed-dial or one touch button function on most cell phones.

To change the check in period from 1 hour, the user will:

1. press **0** (Advanced Menu)
2. press **4#** (Change your IVR dial out number)
3. enter the **number of minutes** for the desired interval, then #
4. press ***** to exit to the main menu
5. press ***** to exit the system

For more detailed instructions, please refer to the *SafetyLine Mobile Worker Monitoring System User Manual*.

Safety Line Interactive Voice Response System Menu





**VANCOUVER LANDFILL
SAFE WORK PROCEDURE**

LEGAL TERMS AND CONDITIONS

- You agree that entry to and use of the site is at your own risk and that neither the City of Vancouver, nor its employees or agents will be liable for any loss or injury to person or property whether or not caused by negligence.
- You agree to comply at all times with the above requirements and to follow the instructions of the Landfill Manager, or their designate, and/or the First Aid Attendant at all times.
- You agree to reimburse the City of Vancouver for any and all costs, losses and damage which may be caused by your failure to carry out safe working practices while on the site or to otherwise comply with this Site Safety Orientation/Agreement.
- The terms of this Site Safety Orientation/Agreement are additional to, and not in replacement of any other Landfill agreement between you and the City of Vancouver. However, in the event of any inconsistency between the two, this agreement prevails.

STATEMENT OF RESPONSIBILITY

Name _____

Company _____

Address _____

Telephone _____

I certify that I have read, understood and agree to comply with and be bound by this Site Safety Orientation/Agreement.

Signature

Date

MEMORANDUM

TO: Lynn Belanger, P. Eng.
City of Vancouver Landfill Operations

DATE: May 19, 2005

FR: Evan Alvernaz, CIH
Colin Wong, P. Eng.

JOB NO: 04-1412-218/1000

**RE: SAFETY AWARENESS SHEET / LANDFILL GAS
VANCOUVER LANDFILL, DELTA, BC**

This document summarizes information regarding general health and safety hazards pertaining to landfill gas and associated general safety precautions, at the Vancouver Landfill, 5400 – 72nd Street, Delta, BC.

1.0 HAZARDS

Key potential hazards associated with landfill gas are:

- **Explosions** – landfill gas (LFG) contains methane that is combustible at concentrations of 5% to 15% by volume in air.
- **Oxygen Deficiency** – landfill gas is composed predominantly of methane (approximately 40% to 65%) and carbon dioxide (approximately 30% to 50%). These gases can displace oxygen from a work space resulting in an oxygen deficient atmosphere. Typically, oxygen deficient conditions will only develop in confined spaces, deep depressions and/or as a result of uncontrolled releases of landfill gas.
- **Hydrogen Sulphide** - concentrations as high as 1,000 ppm have been identified in one well on one occasion. The latest data from May 2, 2005 indicated hydrogen sulphide concentrations below 286 ppm in all measured wells; however, hydrogen sulphide concentrations in the ambient environment have typically been identified to be below the detection limit of data logging instruments when used on the site.
- **Volatile Organic Compounds (VOC)** - other VOCs may also be present in landfill gas; however, these compounds have typically been present in trace concentrations. Some of the VOCs identified on site include: benzene, xylene, toluene and vinyl chloride.

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2.0 OCCURRENCE OF LANDFILL GAS

Landfill gas exists in the landfill gas collection system and in leachate and condensate collection system piping. It can seep through the landfill cover into the atmosphere or it can be forced into the atmosphere from leaks when under pressure (within the landfill gas flare station compound and in buried transmission pipes leading to the Powerhouse). The majority of the landfill gas is collected under negative pressure by the landfill gas collection system, which is comprised of wells and headers from different regions of the landfill. Each of these regions has landfill gas with its own variable characteristics. Some known areas where there may be elevated levels of landfill gas include: manifold boxes, areas adjacent to lateral collection lines, condensate traps, soil depressions and leachate ditches.

3.0 SAFETY PRECAUTIONS

The following safety precautions must be followed with respect to landfill gas:

1. Do not smoke anywhere on the landfill. Open flames are only permitted on the landfill with prior written permission from appropriate Landfill personnel.
2. Comply Workers' Compensation Board of British Columbia regulations when entering any confined space, depression, or potentially poorly ventilated areas. Adhere to the precautions and procedures identified in Table 1: Important LFG Characteristics and Facts.
3. Ensure that all gas detection equipment is in good working order and that it is bump tested daily prior to use. If bump testing identifies gas detection equipment not be working within its tolerance limits or if the equipment is outside of its calibration period, it must be removed from service immediately. Personnel must be trained in the use and limitations of the gas detection equipment used and must use it in accordance with Vancouver Landfill procedures.
4. Do not access the fenced enclosure at the flare station or conduct any work around the landfill gas control system without a personal gas monitor (able to monitor LEL, oxygen and hydrogen sulphide concentrations) and hearing protection. If the personal gas monitor alarm sounds, evacuate the area immediately and notify appropriate Landfill personnel.

City of Vancouver
Lynn Belanger, P.Eng

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5. If possible, stand upwind of wells or any other landfill gas works when conducting work in or around the landfill gas control system. If an accidental or uncontrolled release of landfill gas is believed to have occurred near your work area, attempt to remove yourself from the area by taking a path that is crosswind from the source and attempt to get upwind if you have determined it is safe to do so.
6. Use caution when conducting work within manifold boxes. Personal gas monitors should be used to determine gas concentrations within the manifold boxes prior to work being conducted. If the monitor alarm sounds, allow the manifold box to ventilate prior to rechecking gas concentrations. Work should not proceed until gas concentrations are below alarm levels.
7. If a hydrogen sulphide odour is detected and you do not have a hydrogen sulphide monitor in good working condition, you should remove yourself from the area of concern and notify appropriate Landfill personnel.
8. Follow all other Vancouver Landfill safety precautions, as appropriate.

Golder Associates

TABLE 1: Important LFG Characteristics and Facts

Compound	Important Gas Concentrations	Comments
Methane	Less than 10% ⁽¹⁾	<ul style="list-style-type: none"> Methane gas concentrations are to be maintained at less than 10% of the lower explosive limit (LEL) at all times.
Oxygen	19.5% to 23.5% ⁽¹⁾	<ul style="list-style-type: none"> Oxygen concentrations below 19.5% represent an oxygen deficient atmosphere. The ambient atmosphere has an oxygen concentration of 20.9%. Oxygen concentrations above 23.5% indicate the presence of an oxygen rich environment and represent a fire hazard. Oxygen rich environments should not typically exist at the landfill. These conditions typically only occur when a work process introduces pure oxygen, such as welding. If oxygen concentrations are less than 19.5% or above 23.5%, all work should stop and personnel should leave the work area.
Hydrogen Sulphide	Less than 5 ppm ⁽¹⁾	<ul style="list-style-type: none"> The immediately dangerous to life and health (IDLH) concentration of hydrogen sulphide has been identified to be 100 ppm. The Workers' Compensation Board of British Columbia (WCB BC) ceiling limit for hydrogen sulphide is 10 ppm. Hydrogen sulphide concentrations should be maintained at less than 5 ppm. If hydrogen sulphide concentrations exceed this level, work procedures should be reviewed to ensure that they adequately protect site personnel. At elevated concentrations hydrogen sulphide gas will deaden your sense of smell within minutes. You can smell hydrogen sulphide at concentrations less than 1 ppm. The smell is often described as being like rotten eggs. Ambient levels have been identified to typically be below the detection limit of data logging instruments.

Note: (1) Personal gas monitors must be set to alarm when gas concentrations exceed the gas concentrations identified in Table 1. If the monitor alarm sounds, evacuate the work area immediately and notify appropriate Landfill personnel.