Project Title DEPARTMENT OF NATIONAL DEFENCE, 8 WING CFB TRENTON, ASTRA, ONTARIO

CONTAMINATED SOIL REMOVAL, FORMER HANGAR6 (AEC#3 and AEC#4)

Project Number R.082882.001

Project Date 2017-05-29

END OF SECTION

List of Drawings

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C-08	SEQUENCE OVERVIEW
C-09	DEPTH TO BEDROCK
C-10	SITE RESTORATION

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Title and description of Work.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 In the area of the former Paint Shop to the former Hangar 6 located at 8 Wing, CFB Trenton, Astra, Ontario, soil and groundwater contamination has been identified. Soil contamination by volatile organic compound (VOC) to levels characterizing the soil as both hazardous and non-hazardous waste as well as soil contaminated by metals (i.e., arsenic) to levels characterizing the soil as non-hazardous waste are present, all from surface to bedrock. Work of this Contract comprises of removal by means of excavation to bedrock and off-site disposal. In order to remove this soil, concrete slabs must be removed and dewatering performed. The concrete slab is considered inert. The groundwater is contaminated with VOCs, free-phase dense non-aqueous phase liquid (DNAPL), metals, and total suspended solids (TSS), therefore, it must be treated prior to discharge. Upon completion of the excavation, the site must be restored by backfilling the excavation with clean fill to re-instate grades. This project is identified as PWGSC project Number R.82882.001.

.2 Contractor must be licensed and have the appropriate regulatory approvals to transport hazardous and non-hazardous material in accordance with applicable legislation including but not limited to:

.1 Transport of Dangerous Goods Act.

1.3 WORK COVERED BY CONTRACT DOCUMENT (cont'd)

.2 Canadian Environmental protection Act.
.3 Ontario Environmental Protection Act.
.4 Ontario Regulation 347.
.1 Including Certificate(s) of Approval from the Ontario Ministry of the Environment and Climate Change, as applicable.

1.4 CONTRACT FORM

.1 Construct work under Bid and Acceptance Form-Combined Price Contract and the Unit Price Table.

1.5 WORK SCHEDULE

.1 As per Section 01 32 16, provide schedule for completion of remediation and restoration. All work under this contract to be completed within 60 working days of the Notice to Proceed date.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 MINIMUM STANDARDS

.1 Execute work to meet or exceed:

.1 Rules and regulations of authorities having jurisdiction.

.2 Observe and enforce construction safety measures required by National Building Code 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.

.3 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, Workplace Safety and Insurance Act and municipal statutes and authorities.

.4 Environmental Protection Act, Revised Statutes of Ontario 1990, Chapter E19 as amended, O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans, O. Reg. 103/94, Industrial, Commercial and Institutional Source Separation Programs and O. Reg. 347, General- Waste Management.

.5 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

.6 Canadian Environmental Assessment Act.

.7 Canadian Environmental Protection Act (New Substance Notification Regulations).

.8 Transportation of Dangerous Goods Act.

1.2 AUTHORITIES HAVING JURISDICTION

.1 Engineer is the sole authority having jurisdiction over this project with regards fire standards.

.2 PWGSC is the authority having jurisdiction within the fenced work area, as shown in the drawings. DND is the authority having jurisdiction for all areas outside of the fenced work area.

1.3 ROAD LOAD RESTRICTIONS

.1 Within the Town of Astra, the year round maximum load restrictions are posted.

.2 Comply with posted restrictions. Acquire and submit to Departmental Representative copies of all necessary permits.

1.4 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.5 FEES, PERMITS, CERTIFICATES AND LETTERS

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates, permits and letters required.

.3 Furnish certificates, permits and letters when requested.

1.6 EXAMINATION

.1 Attend the on-site kickoff meeting with the Departmental Representative to examine existing site conditions and determine conditions affecting work.

.2 Notify Departmental Representative in writing of any discrepancies between contract documents and site conditions.

1.7 DOCUMENTS

.1 Keep one copy of contract documents and shop drawings on the site including:
- .1 contract drawings
- .2 specifications
- .3 amendments and addenda
- .4 change orders
- .5 reviewed shop drawings, product data and samples.
- .6 other modifications to Contract
- .7 copy of approved work schedule
- .8 field test records
- .9 inspection certificates
- .10 manufacturer's certificates
- .11 manufacturer's installation and application instructions
- .12 labour conditions and wage schedules

1.7 DOCUMENTS (CONT'D)

.13 Material Safety Data Sheets
.14 labour and material bonds
.15 all applicable permits maintain documents in clean, dry, legible condition and make documents available at all times for inspection by Departmental Representative.

1.8 CONTRACTOR'S AS-BUILT DRAWINGS, SPECIFICATIONS AND AERIAL PHOTOGRAPHS

.1 As work progresses, neatly record significant deviations from the Contract drawings, specifications and aerial photographs using fine, red marker on full size white prints and specifications. Make the same changes on the electronic files.

.2 Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but shall be neat and accurate. Add at each title block note: "AS BUILT". Also circle on List of Drawings/Photographs each title and number of drawing/photograph marked with "AS-BUILT" information. Circle on Table of Contents each specification section number and title of specification sections marked with "AS-BUILT" information.

.3 Departmental Representative will provide one electronic set of drawings, schedules, specifications and aerial photographs for as-built drawing and specification purposes.
.1 Drawings are in Autocad.
.2 Aerial Photographs are in pdf format.
.3 Specifications and addenda are in pdf format.

.4 Record following significant deviations:
.1 Depths of various elements of foundation.
.2 Horizontal and vertical location of underground utilities.
.3 Field changes of dimension.
.4 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.
.5 Alternative materials replacing original materials specified by trade name.

.5 Turn one set, paper copy and electronic copy, of AS-BUILT drawings, specifications and aerial photographs over to Departmental Representative on completion of work.

1.8 CONTRACTOR'S AS-BUILT DRAWINGS, SPECIFICATIONS AND AERIAL PHOTOGRAPHS (CONT'D)

.6 If project is completed without significant deviations from Contract drawings, specifications and Aerial photographs submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.9 ELECTRONIC SUBMITTALS

.1 Comply with Section 01 33 00.

1.10 SHOP DRAWINGS AND PRODUCT DATA SHEETS

.1 Prior to submission check and certify as correct, shop drawings and product data sheets. Issue to Departmental Representative each submission at least 14 days before dates reviewed submission will be needed.

.2 Where technical sections specify that shop drawings bear the stamp of a Registered Professional Engineer, the Engineer must be registered in the Province of Ontario.

1.11 CONSTRUCTION PHOTOGRAPHS

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution.

.2 Identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints and location of viewpoints determined by Departmental Representative.

.4 Frequency: at completion of: excavation demolition, fill and grading, and as directed by Departmental Representative.

1.12 SAMPLES

.1 Submit duplicate samples of new materials being installed under this contract.

.2 Identify manufacturer's name and product.

.3 Installed work shall match reviewed sample.

1.13 ADDITIONAL DRAWING/PHOTOGRAPHS

.1 Departmental Representative may furnish additional drawings/Aerial photographs to clarify work.

.2 Such drawings/Aerial photographs become part of Contract Documents.

1.14 PROTECTION

.1 Protect existing work from damage.

.2 Replace damaged existing work with material and finish to match original.

.3 Protect existing trees and plants on site and adjacent properties.

.4 Protect existing active utilities and infrastructure from damage as indicated on Drawing C-04.

.5 Protect areas that are not within work area.

.6 Repair any damage to areas resulting from the execution of the work.

1.15 EXISTING SERVICES

.1 Maintain existing services in occupied areas.

.2 Provide sanitary facilities.

.3 Provide potable water. Refer to Section 01 51 00.

.4 Use of electrical services at no cost. Contractor to arrange for connections (assumed less than 200 m from work site) and tie-ins to the Base electrical services as indicated on Drawing C-04.

1.16 TEMPORARY FACILITIES AND SERVICES

.1 Provide and maintain temporary facilities and services required to carry out work.

.2 Remove temporary facilities and services on completion of work.

.3 Provide and maintain temperature and enclosure required to prevent frost damage to work.

.4 Departmental Representative to have access to temporary facilities, as required.

1.17 METRIC SIZED MATERIALS

.1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.

.2 The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.

.3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.

.4 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.

.5 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

1.18 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.

.3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.19 CUTTING AND REMEDIAL WORK

.1 Co-ordinate work to keep cutting and remedial work to a minimum while still meeting specification requirements and maintaining safety.

.2 Execute cutting and remedial work required as indicated on Drawing C-05.

1.19 CUTTING AND REMEDIAL WORK (CONT'D)

.3 Use specialists in affected material to execute cutting and remedial work.

.4 Match work to adjoining construction and finishes.

.5 Make good surfaces exposed or disturbed by work with material and finish to match existing adjoining surfaces.

1.20 ALTERATIONS TO EXISITNG SURFACES

.1 Remove, break and dispose of portions of asphalted surfaces, concrete pad and portions of non-reinforced concrete apron in accordance with Section 02 41 15 and as indicated on Drawing C-05.

.2 Decommission and dispose of monitoring wells in accordance with Section 33 29 00 and as indicated on Drawing C-05.

1.21 CO-ORDINATION AND CO-OPERATION

.1 Site will be occupied during execution of work.

.2 Buildings will be occupied during execution of work.

.3 Work areas will be occupied during execution of work.

.4 Execute work with minimum disturbance to occupants and normal use of site, building and work area.

.5 Maintain access and exits.

.6 Where security has been reduced by work of contract, provide temporary means to maintain security.

1.22 INSPECTION AND TESTING

.1 When initial tests and inspections reveal work not to contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.

1.23 COST BREAKDOWN

.1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating Contract Amount.

1.24 SCHEDULING

.1 On Award of Contract submit bar chart construction schedule for work in accordance with Section 01 32 16.

.2 Within 48 hours of acceptance of bid submit a list of subcontractors.

.3 Carry out work Monday to Friday from 07:00 to 16:00 hours.

1.25 CLEANING

.1 Maintain project free of accumulated waste and rubbish.

.2 Final cleaning:
- .1 Remove temporary protection.
- .2 Remove dust, dirt and foreign matter from surfaces.
- .3 Broom clean paved exterior surfaces, rake clean other exterior surfaces.
- .4 Remove snow and ice from access to building and parking lots.
- .5 Airfield shall be kept free of any debris or gravel.

1.26 CONSTRUCTION & DEMOLITION WASTE

.1 Refer to Section 01 74 20.

1.27 ASBESTOS DISCOVERY

.1 If during alteration work existing asbestos material is discovered, stop work and immediately notify Departmental Representative. Do not remove any existing material containing asbestos fibres.

1.28 SPECIAL PROTECTION AND PRECAUTIONS

.1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of material safety data sheets acceptable to ESDC - Labour Program.

1.29 POLLUTION CONTROL

.1 Spills of deleterious substances:
.1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.

.2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060 and Departmental Representative.

.3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

1.30 OPSS AND OPSD

.1 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage.

1.31 PROJECT MEETINGS

.1 Comply with Section 01 31 19.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

.2 Doorways of existing building within the work zone to be barricaded by others prior to any Work.

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Where security is reduced by work provide temporary means to maintain security.

.3 Use of sanitary facilities for use by Contractor's personnel will not be assigned. Contractor to provide temporary facilities in accordance with Section 01 51 00.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 EXISTING SERVICES

.1 Notify Base Shops, Departmental Representative and affected utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Departmental

1.4 EXISTING SERVICES (CONT'D)

Representative 4 days of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00.

1.5 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work Monday to Friday from 7:00 to 16:00 hours.

.2 Submit schedule in accordance with Section 01 32 16 .

.3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.4 Keep within limits of work and avenues of ingress and egress.

.5 Ingress and egress of Contractor vehicles at site shall be coordinated with Departmental Representative at time of contract award.

1.6 SECURITY

.1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

.2 Security clearances:

.1 All personnel employed on this project must have valid reliability security status for the full duration of the project; valid status to be obtained minimum of 10 days prior to commencing the work.

1.6 SECURITY (CONT'D)

.3 Security Escort:

.1 Personnel employed on this project must be escorted when executing work in non-public areas during normal working hours. Personnel must be escorted in all areas after normal working hours.

.2 Submit an escort request to Departmental Representative at least 14 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by DND/PWGSC. Cost incurred by late request will be Contractor's responsibility.

.3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 4 hours before scheduled time of escort. Cost incurred by late request will be Contractor's responsibility.

.4 Calculation of costs will be based on average hourly rate of security escort for minimum of 8 hours per day for late service request and of 4 hours for late cancellations.

1.7 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work, at minimum on a weekly basis, and at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting 4 days in advance of meeting date to Departmental Representative.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Contractor to record minutes of meetings unless directed otherwise by Departmental Representative. Include significant proceedings and decisions including actions by parties.

.7 Contractor to circulate meeting minutes to attending parties and affected parties not in attendance within 2 days after meeting.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within 7 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 7 days before meeting.

1.2 PRECONSTRUCTION MEETING (CONT'D)

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:
- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work: in accordance with Section 01 32 16.
- .3 Schedule of submissions in accordance with Section 01 33 00.
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
- .5 Site security in accordance with Section 01 35 13 and Section 01 56 00.
- .6 Health and safety in accordance with Section 01 35 29.14.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted time extensions, overtime, administrative requirements.
- .8 Record drawings and specifications in accordance with Section 01 33 00.
- .9 Monthly progress claims, administrative procedures, photographs, hold backs.
- .10 Appointment of inspection and testing agencies or firms.
- .11 Insurance, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work prior to project completion, schedule progress meetings, at a minimum on a weekly basis, and at the call of Departmental Representative. May coincide with scheduled administrative meetings.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative and Owner are to be in attendance.

.3 Notify parties minimum 5 days prior to meetings.

1.3 PROGRESS MEETINGS (CONT'D)

.4 Contractor to record minutes of meetings and circulate to attending parties and affected parties not in attendance within 2 days after meeting.

.5 Agenda to include the following:
- .1 Review, approval of minutes of previous meeting.
- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Weather related delays with their remedial measures will be discussed and negotiated.
- .5 Problems which impede construction schedule.
- .6 Review of off-site fabrication delivery schedules.
- .7 Corrective measures and procedures to regain projected schedule.
- .8 Revision to construction schedule.
- .9 Progress schedule, during succeeding work period.
- .10 Review submittal schedules: expedite as required.
- .11 Maintenance of quality standards.
- .12 Review proposed changes for effect on construction schedule and on completion date.
- .13 Other business.

.6 Submittals for Progress Meetings: make submittals at least 4 days prior to scheduled progress meetings as follows:
- .1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown, and material removal.
- .2 Copies of soil sampling results.
- .3 Copies of transport manifests, trip tickets, and disposal receipts for waste materials removed from work area.
- .4 Weekly copies of site entry and work area logbooks and information on worker and visitor access.
- .5 Copies of underground locates and utility protection plan.
- .6 Daily logs documenting inspection of sediment controls.

1.3 PROGRESS MEETINGS (CONT'D)

.7 Information on borrow sources being used to supply backfill material.

.8 Other information required by Departmental Representative or relevant to agenda for upcoming progress meetings.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

1.1 DEFINITIONS (CONT'D)

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Submit to Departmental Representative within 5 working days of Award of Contract a Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart

1.5 MASTER PLAN (CONT'D)

(GANTT).

.2 Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Permits.
.3 Mobilization.
.4 Protection of utilities and site features in accordance with Drawing C-04 and demolition and removals in accordance with Drawing C-05.
.5 Dewatering well installation.
.6 Dewatering treatment system operation.
.7 Soil excavation, handling, transportation and disposal.
.8 Backfilling, compacting and grading.
.9 Site restoration.
.10 Waste disposal.
.11 Demobilization.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

1.7 PROJECT SCHEDULE REPORTING (CONT'D)

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Refer to Section 01 31 19.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

1.1 ADMINISTRATIVE (CONT'D)

.10 Keep one reviewed copy of each submission on site.

.11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward unlocked pdf, MS Word, MS Excel, MS Project and Autocad dwg files on compact disk (CD) compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, plans and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario of Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 14 working days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of

1.2 SHOP DRAWINGS AND PRODUCT DATA (cont'd)

revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit three hard copies and one electronic copy of product data sheets, shop drawings or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.11 Submit three hard copies and one electronic copy

1.2 SHOP DRAWINGS AND PRODUCT DATA (cont'd)

of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.12 Submit three hard copies and one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.13 Submit three hard copies and one electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.14 Submit three hard copies and one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.15 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Delete information not applicable to project.

.17 Supplement standard information to provide details applicable to project.

.18 If upon review by Departmental Representative,

1.2 SHOP DRAWINGS AND PRODUCT DATA (cont'd)

no errors or omissions are discovered or if only minor corrections are made, transparency copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.19 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's business address.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

1.3 SAMPLES (CONT'D

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 CERTIFICATES

.1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

1.5 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and permits required.

.3 Furnish certificates and permits.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL PROTECT

.1 Do not disrupt airport business except as permitted by Departmental Representative.

.2 Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic: to Section 01 56 00.

.3 Provide barricades and lights where directed by Departmental Representative.

1.2 MOVEMENT OF EQUIPMENT AND PERSONNEL

.1 In areas of airport not closed to aircraft traffic:
- .1 Obtain Departmental Representative's approval on scheduling of Work.
- .2 Control movements of equipment and personnel as directed by Departmental Representative.
- .3 Provide qualified field personnel at locations designated by Departmental Representative to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
- .4 Immediately obey signals from airport traffic control tower.

1.3 UNSERVICEABLE AREAS

.1 Mark off areas made unserviceable for aircraft by Work of this Contract by providing highly visible danger markings by day and red lights by night.

.2 Open flames and flammable fuels are not permitted.

.3 Park equipment not in use and stockpile materials so that stockpile tops are below 50 to 1 ratio from ends of usable landing strip and below 20 to 1 ratio from sides of aircraft traffic areas.
- .1 Mark tops with red lights as directed by Departmental Representative.

1.4 TRENCHING

.1 Obtain Departmental Representative's written permission to undertake trenching on pavements open to aircraft traffic which cannot be completed, backfilled and sealed within 1 working day.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Sections 01 11 06 and 01 33 00.

.2 Submit, prior to start of work, detailed work plan (including management of hazardous wastes).

.3 Site Layout: within 7 days after date of Notice to Proceed and prior to mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:

- .1 Means of ingress, egress and temporary traffic control facilities including location and construction details of access ramp.
- .2 Equipment and material staging areas.
- .3 Soil stockpile areas.
- .4 Exclusion Zones, Contaminant Reduction Zones, and other zones specified in Contractor's site-specific Health and Safety Plan.
- .5 Truck and vehicle routes and frequencies, entrance and exit to work site is to be identified and documented prior to initiation of construction work at the respective work area.
- .6 Soil stockpile and any temporary demolition debris stockpile areas shall be confirmed before construction work begins and any proposed changes to the areas indicated will be confirmed by the Departmental Representative. The locations of stockpiles and debris management areas will be selected based on the needs of the air facility (refer to Section 01 35 13.13 for specific stockpile requirements for airfield considerations), ability to control potential erosion and migration of soil and dust.
- .7 Wastewater treatment facilities and Wastewater storage tanks/areas.

.4 Complete the Remediation and Risk Management Checklist included in Appendix E and following the completion of the work submit a copy of the completed checklist to the Departmental Representative.

.5 Equipment Decontamination Pad: submit equipment decontamination pad design, in accordance with Section 01 35 43, to Departmental Representative for review prior to commencing construction (tentative location shown on Drawing C-02).

1.1 SUBMITTALS (cont'd)

.6 Submit documentation verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29.14.

1.2 REGULATORY REQUIREMENTS

.1 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

.2 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.

.1 Contractor: responsible for complying with amendments as they become effective.

.3 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.3 SOIL STOCKPILING FACILITIES

.1 Provide, maintain, and operate storage/stockpiling facilities as required.

.2 Equip facility with tarps capable of covering stockpiled material until Departmental Representative advises Contractor to dispose of material off site.

.3 Stockpiling facilities to be equipped with liners in accordance with Section 31 22 20.

1.4 DEWATERING, WATER TREATMENT FACILITY AND WATER AND WASTEWATER STORAGE TANK

.1 Dewatering, water treatment facility and water and wastewater storage tank design and operation requirements in accordance with Section 31 23 19.

1.5 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and place into designated area approved by Departmental Representative. Clean access

1.5 VEHICULAR ACCESS AND PARKING (cont'd)

roads at least once per shift.

.2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

1.6 DUST AND PARTICULATE CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures immediately during construction and in accordance with Province of Ontario regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for dust and particulate control.

.4 Use chemical means for water misting system for dust and particulate control only with Departmental Representative's prior written approval.

.5 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.

.6 Prevent dust from spreading to adjacent property sites.

.7 Departmental Representative will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.

.8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

1.7 POLLUTION CONTROL

.1 Pollution control measures in accordance with Section 01 35 43.

1.8 EQUIPMENT DECONTAMINATION

.1 Equipment decontamination in accordance with Section 01 35 43.

1.9 WATER CONTROL

.1 Maintain excavations free of water.

.2 Protect site from puddling or running water. Grade site to drain.

.3 Prevent surface water runoff from leaving work areas.

.4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.

.5 Prevent precipitation from infiltrating or from directly running off stockpiled soil materials. Cover stockpiled soil materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by Departmental Representative.

.6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.

.7 Control surface drainage including ensuring that water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

.8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

.10 Contain water from stockpiled soil materials. Transfer potentially contaminated surface waters to wastewater storage tanks separate.

.11 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

.12 Contain and collect wastewaters and transfer such collected wastewaters to Contractor -supplied

1.9 WATER CONTROL (cont'd)

wastewater storage tanks for treatment.

.13 Assist the Departmental Representative as required in the testing and classification of waters prior to discharge, prior to treatment.

1.10 DEWATERING

.1 Dewatering in accordance with Section 31 23 19.

1.11 SEDIMENT CONTROL

.1 Provide sediment control plan that identifies type and location of sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Plan and execute construction by methods to control surface drainage from cuts and fills, from stockpiles, staging areas, and other work areas. Prevent sedimentation. The area of work is paved in either concrete or asphalt pavement. Sediment control measures are largely required to prevent tracking of soil out of the work area by vehicles or precipitation driven run-off carrying sediments from stockpiled soil.

.3 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by sedimentation as directed by Departmental Representative.

.4 Provide and maintain temporary measures which may include, geotextiles and other construction required to prevent migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction.

.5 Plan construction procedures to avoid damage to work or equipment encroachment onto drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank to existing condition.

1.11 SEDIMENT CONTROL (cont'd)

.6 Installation:

.1 Check sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

.2 Whenever sedimentation is caused by stripping vegetation, re-grading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

.3 Prior to or during construction, Departmental Representative may require installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching, sediment traps, grading and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by Departmental Representative.

.4 Only as directed by Departmental Representative, remove temporary sediment control devices upon completion of Work.

.7 If soil and debris from site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.12 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.

.2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.13 FINAL DECONTAMINATION

.1 Final decontamination in accordance with Section 01 35 43.

1.14 REMOVAL AND DISPOSAL

.1 Removal and disposal of materials and wastes in accordance with Section 01 35 43.

1.15 RECORD KEEPING

.1 Maintain adequate records to support information provided to Departmental Representative regarding exception reports, annual reports, and biennial reports.

.2 Maintain waste shipment records for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.

.3 Maintain bills of ladings for minimum of 375 days from date of shipment or longer period required by applicable law or regulation.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Province of Ontario
- .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter 0.1 as amended, and Regulations for Construction Projects, 0. Reg. 213/91 as amended.
- .2 0. Reg. 490/09, Designated Substances.
- .3 Workplace Safety and Insurance Act, 1997.
- .4 Municipal statutes and authorities.

1.2 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Measures and controls to be implemented to address identified safety hazards and risks.

.3 Provide a Fire Safety Plan, specific to the work location. The plan shall be coordinated with the requirements of Section 01 35 35.

.4 Provide a Utility Protection Plan to protection all utilities in accordance with Drawing C-04.

.5 Contractor's and Sub-contractors' Safety Communication Plan.

.6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Base Emergency Response requirements and procedures provided by Departmental Representative.

1.2 SUBMITTALS (cont'd)

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.8 Departmental Representative will review contractor's final Health and Safety plan; review of final plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Submit names of personnel and alternates responsible for site safety and health.

.10 Submit records of Contractor's Health and Safety meetings when requested.

.11 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

.12 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.13 Submit copies of incident and accident reports.

.14 Submit Material Safety Data Sheets (MSDS).

.15 Submit Workplace Safety and Insurance Board (WSIB) - Experience Rating Report.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to commencement of Work.

1.4 WORK PERMIT

.1 Obtain permits related to project prior to commencement of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Comply with the Acts and regulations of the Province of Ontario.

.2 Comply with specified standards and regulations to ensure safe operations at site.

1.8 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 VOC chlorinated solvents and metals associated with impacted soil and/or groundwater at all work areas, and silica from concrete slab/apron to be demolished.

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.

.3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

1.11 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

.3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

1.12 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the occupational health and Safety Act for the Province of Ontario.

1.13 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.

.1 Contractor's Safety Policy.
.2 Contractor's Violence and Harassment Policies.
.3 Constructor's Name.
.4 Notice of Project.
.5 Name, trade, and employer of Health and

1.13 POSTING OF DOCUMENTS (cont'd_)

Safety Representative or Joint Health and Safety Committee members (if applicable).

.6 Ministry of Labour Orders and reports.

.7 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.

.8 Address and phone number of nearest Ministry of Labour office.

.9 Material Safety Data Sheets.

.10 Written Emergency Procedures.

.11 Site Specific Safety Plan.

.12 Valid certificate of first aider on duty.

.13 Inspection card for first-aid box.

.14 Location of nearest hospital and map.

.15 WSIB "In Case of Injury At Work" poster.

.16 Location of toilet and cleanup facilities.

.17 DANGER signs in hazardous areas.

1.14 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.16 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

.2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 FIRE DEPARTMENT BRIEFING

.1 Departmental Representative will co-ordinate arrangements for contractor for briefing on Fire Safety at pre-work conference by Fire Chief before work is commenced.

1.2 REPORTING FIRES

.1 Know location of nearest fire alarm box and telephone, including emergency phone number.

.2 Report immediately fire incidents to Fire Department as follows:
- .1 Activate nearest fire alarm box; or
- .2 Telephone.

.3 Person activating fire alarm box will remain at box to direct Fire Department to scene of fire.

.4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

1.3 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

.1 Fire protection and alarm system will not be:
- .1 Obstructed;
- .2 Shut-off; and
- .3 Left inactive at end of working day or shift without authorization from Fire Chief.

.2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Chief.

1.4 FIRE EXTINGUISHERS

.1 Supply fire extinguishers, as scaled by Fire Chief, necessary to protect work in progress and Contractor's physical plant on site.

1.5 BLOCKAGE OF ROADWAYS

.1 Advise Fire Chief of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Chief, erecting of barricades and digging of trenches.

1.6 SMOKING PRECAUTIONS

.1 Observe and comply with smoking regulations.

1.7 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials at minimum quantities.

.2 Burning of rubbish is prohibited.

.3 Removal:
.1 Remove rubbish from work site at end of work day or shift or as directed.

.4 Storage:
.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove specified.

1.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 Handling, storage and use of flammable and combustible liquids governed by current National Fire Code of Canada.

.2 Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of Fire Chief.

.3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.

1.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS (cont'd)

.4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.

.5 Do not use flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents.

.6 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities minimum and Fire Department is to be notified when disposal is required.

1.9 HAZARDOUS SUBSTANCES

.1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada.

.2 Obtain from Fire Chief a "Hot Work" permit for work involving welding, burning or use of blowtorches and salamanders, in buildings or facilities.

.3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of Fire Chief. Contractors are responsible for providing fire watch service for work on scale established and in conjunction with Fire Chief at pre-work conference.

.4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform Fire Chief prior to and at cessation of such work.

1.10 QUESTIONS AND/OR CLARIFICATION

.1 Direct questions or clarification on Fire Safety in addition to above requirements to Fire Chief.

1.11 FIRE INSPECTION

.1 Co-ordinate site inspections by Fire Chief through Departmental Representative.

.2 Allow Fire Chief unrestricted access to work site.

.3 Co-operate with Fire Chief during routine fire safety inspection of work site.

.4 Immediately remedy unsafe fire situations observed by Fire Chief.

1.12 PERMITS

.1 Comply with hot work permits.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00.

.2 After date of Notice to proceed and minimum 7 days prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan to include:
- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
- .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
- .3 Names and qualifications of persons responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.

.5 Drawings showing locations of proposed material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

1.2 SUBMITTALS (cont'd)

.6 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.8 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.9 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.10 Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Utility protection plan including measures to protect utilities in accordance with Drawing C-04 and Section 01 35 29.

.12 Detailed excavation plan including sequencing and measures to manage non-hazardous, non-contaminated materials, non-hazardous contaminated materials and hazardous materials generated during excavation. Waste disposal plan identifying methods and locations for waste disposal.

.13 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.14 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.4 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.3 Do not discharge wastes into streams or water ways.

.4 Remove surplus materials and temporary facilities from site.

.5 Separate and dispose of accumulated waste materials off-site in accordance with R.R.O. 1990, Reg. 347 General Waste Management, to MOECC approved disposal facilities or approved transfer stations, including, but not limited to, the following:
.1 Debris including excess construction material.
.2 Non-contaminated litter and rubbish.
.3 Disposable PPE worn during final cleaning.
.4 Non-hazardous and hazardous waste disposal in accordance with Section 02 50 00.
.5 Lumber from decontamination pads.

.6 Appropriate procedures shall be implemented for handling, temporary storage, transport and disposal of impacted soils during all phases of the project. Refer to Land Disposal Restrictions in O.Reg. 347 - General Waste Disposal under Ontario EPA and MOECC Fact Sheet "Summary of Land Disposal Restrictions, Treatment and Notification Requirements for Waste Generators". Off-site disposal will be by licensed haulers to a MOECC-approved disposal facility.

.7 Disposal/recycling of other waste generated during the project shall be done in compliance with Ontario Waste Regulations and the facilities used will be approved by the Departmental Representative.

.8 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

1.5 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:
.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and place into designated area approved by Departmental

1.5 VEHICULAR ACCESS AND PARKING (cont'd)

Representative. Clean access roads at least once per shift.

.2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

.2 Vehicles/equipment shall be in good working order and not be leaking any fuel or fluids.

.3 Restrict access of vehicles from creek banks to protect slope stability.

.4 During construction designated fuelling area(s) will be established.

.5 Refuelling of vehicles and equipment shall not be conducted near watercourses.

.6 Traffic management measures (such as 'flag man') shall be implemented if required at site access points to direct traffic.

1.6 EQUIPMENT DECONTAMINATION

.1 Prior to commencing work involving equipment contact with potentially contaminated materials, Contractor to construct equipment decontamination pad in area as indicated on Drawing C-02 to accommodate largest piece of on-site potentially contaminated equipment. The decontamination pad shall be water tight and drain to a sediment trap followed by a sump. Pad shall comprise a waterproof liner (Refer to Section 31 32 20 for liner specifications).

.2 Provide, operate, and maintain suitable portable, high-pressure, low-volume decontamination wash units equipped with self-contained water storage tank and pressurizing system and capable of heating and maintaining wash waters to 80 degrees C and providing nozzle pressure of 1,035 kpa.

.3 Provide, operate, and maintain necessary equipment, pumps, piping, materials, labor and supplies required to collect and contain equipment decontamination wastewater and sediment and transfer materials to approved off-site disposal facilities(solid & sediment) or on-site treatment (wash water).
.1 Liner in accordance with Section 31 32 20.

.4 Commence Work involving equipment contact with potentially contaminated material only after Equipment

1.6 EQUIPMENT DECONTAMINATION (cont'd)

Decontamination Pads are constructed and operational to the approval of the Departmental Representative.

.5 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.

.6 Perform equipment decontamination on Contractor-constructed equipment decontamination pad to prevent cross contaminating non-impacted areas.

.7 Equipment decontamination pads shall be removed prior to conclusion of the project.

.8 At minimum, perform following steps during equipment decontamination:

.1 Mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated.

.2 Clean water supply to be provided by Contractor.

.3 Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by Departmental Representative. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages.

.4 Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent.

.5 Air dry equipment in Clean Zone before removing from site or travelling on clean areas.

.6 Perform assessment as directed by Departmental Representative to determine effectiveness of decontamination.

.9 Each piece of equipment will be inspected by Departmental Representative after decontamination and prior to removal from site and/or travel on clean areas. Departmental Representative will have right to require additional decontamination to be completed if deemed necessary at no extra cost.

.10 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

.11 Collect decontamination wastewaters and sediments which accumulate on equipment decontamination pad. Transfer wastewaters to designated wastewater storage tank for treatment by Contractor's water treatment facility.

.12 Transfer sediments to a designated area approved by the Departmental Representative.

1.6 EQUIPMENT DECONTAMINATION (cont'd)

.13 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

.14 Provide sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

.15 Maintain inspection record on site which includes: equipment descriptions with identification numbers or license plates; time and date entering decontamination facility; time and date exiting decontamination facility; and name of inspector with comment stating that decontamination was performed and completed.

.16 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.

1.7 FINAL DECONTAMINATION

.1 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.8 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.3 Do not allow water containing suspended materials to enter into waterways, sewer or drainage systems.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

.5 Do not direct water flow in a manner which would cause erosion to existing areas.

1.9 SURFACE WATER AND GROUNDWATER QUALITY

.1 Materials and equipment shall be operated and stored in a manner that prevents deleterious substances (e.g., petroleum products, silt, etc.) as defined by the Fisheries Act from entering surface water.

1.9 SURFACE WATER AND GROUNDWATER QUALITY (CONT'D)

.2 Impacted groundwater entering excavations shall be collected and treated by the on-site water treatment facility. If effluent fails Contractor to direct water to storage tanks and dispose at an MOECC licensed facility, at own cost.

1.10 POLLUTION CONTROL

.1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.

.2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

.3 Promptly report spills and releases potentially causing damage to environment to:
- .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
- .2 Owner of pollutant, if known.
- .3 Person having control over pollutant, if known.
- .4 Departmental Representative.
- .5 Ontario Ministry of Environment Spills Action Centre (1-800-268-6060).

.4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.

.5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

.6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.

.7 Volatile Organic Compounds (VOC) Control:
- .1 In addition to requirements of Section 01 35 29.14, monitor air quality for volatile organics at perimeter security fence locations as approved by Departmental Representative, every hour during contaminated materials excavation and management activities, and maintain log of

1.10 POLLUTION CONTROL (cont'd)

air quality readings.

.2 If air quality monitoring indicates that release of volatile organics in air at site boundary exceeds Level C of Personnel Protective Equipment threshold for air quality, implement corrective actions to control volatile organics.

.3 If actions are not sufficient to control release of volatile organics within 1/2 hour of identification of air quality problem, suspend work resulting in excessive volatile organic emissions. Departmental Representative and Contractor to discuss additional methods that Contractor proposes to control release of volatile organics.

.4 Make necessary changes at no additional cost to Departmental Representative prior to resuming Work.

.8 In addition, if Departmental Representative's monitoring of ambient air at site perimeter indicates that concentration of contaminants in air exceed unacceptable concentrations of contaminants in air, modify operations to minimize such off-site impacts.

.9 Maintain temporary pollution control features installed under this contract.

.10 Vehicles and equipment must be maintained in good working condition, equipped with emission controls as applicable to local authorities' emission requirements.

.11 Implement dust abatement measures, as required to control dust.

.12 Control emissions from equipment and plant to local authorities' emission requirements.

.13 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.14 Ensure hazardous substances (including fuel) are stored, handled and applied in a manner to prevent release to the environment and in a legal manner in accordance with hazardous waste regulations.

.15 Vehicles shall be shut off when not in use. No vehicle idling on-site.

.16 Store hazardous or toxic substances in a designated area.

.17 Comply with requirements of WHMIS regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of MSDS

1.10 POLLUTION CONTROL (cont'd)

acceptable to Labour Canada.

.18 Catch basins/storm sewers to be kept free of excavated material, debris and waste.

.19 Prevent concrete pad cutting debris and other extraneous materials from contaminating air, and storm sewers beyond application areas. Provide temporary enclosures where directed by Departmental Representative.

1.11 SPILLS OR RELEASE OF DELETERIOUS SUBSTANCES

.1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.

.2 All workers shall be fully aware of the spill prevention and response procedures including notification of Departmental Representative.

.3 The Ontario Ministry of Environment and Climate Change Spills Action Centre must be notified immediately by law at 1-800-268-6060.

.4 The Departmental Representative shall be immediately informed of all spills that occur onsite.

.5 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

.6 Spill kits will be kept on-site during all project phases.

.7 Contractor shall take due care to ensure no deleterious materials including sediment-laden runoff leave the worksite, or enter any: surface water, storm water, or sanitary sewers at or near the worksite.

.8 Equipment fuelling or lubricating shall occur in a designated area with proper controls to prevent the release of deleterious substances, and shall be conducted away from any surface water drains or collection points.

.9 Any equipment remaining on site overnight shall have appropriately placed drip pans.

.10 Protect the roadways from tracking of mud, soil, and debris throughout the work.

.11 Prevent discharges containing asphalt, grout, concrete or other waste materials from reaching storm drains

1.11 SPILLS OR RELEASE OF DELETERIOUS SUBSTANCES (cont'd)

or the marine environment. This includes, but is not limited to:

.1 Minimizing the washing of sand or gravel from new asphalt, debris from drilling or cutting or other materials into storm drains and the marine environment by sweeping.

.2 Application of tack coats or other coatings, if required, during periods when rainfall is unlikely to occur during application.

.3 Cleaning equipment off site.

.4 Protection of drainage structures with filter fences if required.

.12 Concrete wash water or concrete from trucks shall not enter any surface water or storm water system. Concrete pour or grouting should not be performed if significant precipitation is expected within 72 hours. If concrete leachate is generated within 72 hours of concrete pouring or grouting, measures shall be taken to ensure the leachate does not enter the surface or storm water systems.

.13 During the purging of tanks and associated lines, procedures must prevent the release of any fuels to the surface, surface water, catch basins or soils within or surrounding the worksite.

1.12 NOISE CONTROL

.1 All construction equipment shall be operated with exhaust systems in good repair to minimize noise.

.2 Construction activities that could create excessive noise shall be restricted to daylight hours and adhere to the municipal noise by-law.

.3 If work is to be undertaken outside the specified period in the local noise by-law, then approval for an exemption to the by-law shall be obtained by the Contractor from the municipality.

.4 Ensure that noise control devices (i.e. mufflers, silencers) on construction equipment are properly maintained.

1.13 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or

1.13 NOTIFICATION (CONT'D)

regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.14 ENVIRONMENTAL MITIGATION MEASURES

.1 Implement mitigation measures as outlined in the mitigation measures checklist presented in Appendix F. Submit the completed checklist to the Departmental Representative once all related project activities have been completed.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

1.4 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.5 WATER SUPPLY

.1 Provide continuous supply of potable water for worker and construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rates.

1.6 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type.

1.6 TEMPORARY HEATING AND VENTILATION (cont'd)

Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:
- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10°C in areas where construction is in progress.

.5 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Pay costs for maintaining temporary heat, when using permanent heating system.

.7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.

1.6 TEMPORARY HEATING AND VENTILATION (cont'd)

.8 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.7 TEMPORARY POWER AND LIGHT

.1 Owner to provide for temporary power during construction. Contractor to provide minimum 150 m length of connection for tie in to site power as indicated on Drawing C-04.

.2 Contractor to arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project.

1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Sanitary facilities.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSC-1.189-2000, Exterior Alkyd Primer for Wood.
- .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CSA O121-08(2013), Douglas Fir Plywood.
- .3 CSA Z797-09(R2014), Code of Practice for Access Scaffold.
- .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment, withdrawn but still available from CSA, CCOHS and Techstreet.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed number of trailers to be used, avenues of ingress/egress to fenced area and details of access ramp materials and construction details. Submit in accordance with Sections 01 35 13.43 and 01 33 00.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

1.3 INSTALLATION AND REMOVAL (cont'd)

.4 Provide construction facilities in order to execute work expeditiously.

.5 Contractor to supply, install and maintain temporary construction fencing encompassing the entire Site as indicated on Drawing C-04. Estimated quantity is 450 m.

.6 Remove from site all such work after use.

1.4 HOISTING

.1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists/cranes shall be operated by qualified operator.

.3 Operation and load to any hoists/cranes must be within 80% of max rated capacity.

.4 All hoists and related equipment must be inspected daily prior to use

.5 Hoisting must comply with lift plan stamped by Professional Engineer licensed to practice in Ontario. Submit hoist plan in accordance with Section 01 33 00.

1.5 SITE STORAGE/LOADING

.1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on site.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration

1.6 CONSTRUCTION PARKING (cont'd)

of Contract and make good damage resulting from Contractors' use of roads.

.4 Clean construction runways and taxi areas where used by Contractor's equipment.

1.7 OFFICES

.1 Provide office heated, lighted and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.9 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Connection to existing Base sanitary sewer lines is not permitted.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Departmental Representative to have access to sanitary facilities.

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.8 Dust control: adequate to ensure safe operation at all times.

.9 Provide snow removal during period of Work.

1.11 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
- .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA):
- .1 CSA O121-08(R2013), Douglas Fir Plywood.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 HOARDING

.1 Erect approximately 450 m of temporary site enclosure using modular freestanding fencing as indicated on Drawing C-04: galvanized, minimum 1.8 m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys. Maintain fence in good repair.

.2 Demolish and dispose/recycle approximately 60 m of existing chain link fence as indicated on Drawing C-05.

1.5 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.6 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.7 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.9 PROTECTION OF FINISHES

.1 Provide protection for building finishes, site furnishings, and equipment during performance of Work.

.2 Provide necessary screens, covers and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 20.

.7 Remove waste material and debris from site and deposit in waste container at end of each working day.

.8 Dispose of general construction waste materials and debris off site. Impacted soil and groundwater shall be disposed off-site at a Ministry of the Environment and Climate Change licensed facility.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

1.2 PROJECT CLEANLINESS (cont'd)

.10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 FINAL CLEANING

.1 When Work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.8 Remove dirt and other disfiguration from exterior surfaces.

.9 Clean and sweep roofs, gutters, areaways, and sunken wells.

.10 Sweep and wash clean paved areas.

.11 Remove snow and ice from access to building.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION AND DEMOLITION WASTE

.1 Carefully deconstruct and source separate materials/equipment and divert, from demolition and construction waste destined for landfill to maximum extent possible. Target for this project is 50% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.

.2 Source separate waste and maintain waste audits in accordance with the Environmental protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.

.1 Provide facilities for collection, handling and storage of source separated wastes.

.2 Source separate the following waste:

.1 Brick and portland cement concrete.

.2 Corrugated cardboard.

.3 Wood, not including painted or treated wood or laminated wood.

.4 Steel.

.5 Asphalt and concrete paving.

1.2 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.

.1 Indicate how material being removed from the site will be reused and recycled.

.3 Submit proof that all waste is being disposed of at a MOECC licensed land fill site or waste transfer site. A copy of the disposal /waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

.4 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

1.3 WASTE PROCESSING SITES

.1 Province of Ontario:
- .1 Ministry of Environment and Climate Change (MOECC), Public Information Centre, 2nd Floor - MacDonald Block, Suite M2-22 – 900, Bay Street, Toronto, ON, M7A 1N3.
- .2 General Inquiry: 416-325-4000 or 1-800-565-4923 TTY (for persons who are deaf, deafended or hard of hearing).
- .3 Telephone: 416-326-9236 or 1-800-515-2759.

.2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.
- .1 Telephone: 416-657-2797.
- .2 Fax: 416-960-8053.
- .3 Email: rco@rco.on.ca.
- .4 Internet: http://www.rco.on.ca/.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Unless specified otherwise, materials for removal become Contractor's property.

.2 Protect, stockpile, store and catalogue salvaged items.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Protect structural components not removed for demolition from movement or damage

.5 Support affected structures.

.6 Protect surface drainage, mechanical and electrical from damage and blockage.

.7 Separate and store materials produced during dismantling of structures in designated areas

.8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
- .1 On-site source separation is Recommended.
- .2 Remove co-mingled materials to off-site processing facility for separation.
- .3 Provide waybills for separated materials.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Do not bury rubbish and waste materials on Site.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, onto ground, storm or sanitary sewers, or in other locations where it will pose health or environmental hazard.

.3 All waste materials shall be disposed of in a legal manner at a licensed MOECC approved facility.

.4 Provide acceptable containers for collection and disposal of waste materials, debris and rubbish.

.5 Do not allow deleterious substances to enter the waterway.

.6 Keep records of construction waste including:
- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.

.7 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.8 Remove materials from deconstruction as deconstruction/disassembly work progresses.

.9 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate onsite bins for recycling in accordance with Waste Management Plan.

.10 All waste materials including containers and waste fluids associated with vehicle maintenance shall be disposed of in a legal manner at a site approved by the MOECC.

1.5 WASTE MANAGEMENT AND DISPOSAL (CONT'D)

.11 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

.12 Fold up metal banding, flatten and place in designated area for recycling.

.13 Unused admixtures and additive materials shall not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.14 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions collect liquid or solidfy liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local Provincial and National Regulations.

15. Divert hazardous material to MOECC approved facility that only accepts hazardous waste.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Government Chief Responsibility for the Environment.
- .1 Province Address General Inquires.
- .2 Fax Ontario Ministry of Environment (416) 325-4000 (416) 325-3159.
- .3 Public Information Centre (800) 565-4923.
- .4 2nd Floor - MacDonald Block, Suite M2-22, 900 Bay Street, Toronto, ON M7A 1N3 (416) 326-9236, (800) 515-2759.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

- .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
- .2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

- .1 Work has been completed and inspected for compliance with Contract Documents.
- .2 Defects have been corrected and deficiencies have been completed.
- .3 Work is complete and ready for final inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

1.2 CLEANING

.1 In accordance with Section 01 74 11.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 U.S. Environmental Protection Agency (EPA) / Office of Water
- .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Waste Management submittals in accordance with 01 74 20 and 01 33 00.

.2 Utility Protection Plan submittals in accordance with Section 01 35 29 and 01 33 00.

1.3 MEASUREMENT PROCEDURES

.1 Provide unit price per tonne to demolition, removals and disposals of existing asphalt surface to limits indicated in Drawing C-05. Estimated quantity is 160 tonnes.
- .1 Measurement shall be based on the net weight of asphalt paving removed from the site and delivered to the disposal and/or recycling facility, and substantiated by certified weigh bills.
- .2 Unit price shall include all labour, materials and equipment necessary to complete the Work.

.2 Asphalt removal beyond limits specified in Drawing C-05 will not be measured for payment. Make good all damages.

.3 If asphalt is transported off site to be recycled for re-use, submit proof where the materials are being transferred to and the intent for recycling and re-use. Shipping documents must by supplied to Departmental Representative in a timely manner.

.4 If asphalt cannot be recycled and must be sent off site for landfilling, submit proof that all waste is being disposed of at a licensed MOECC

1.3 MEASUREMENT PROCEDURES (cont'd)

land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to the Departmental Representative prior to removal of the waste from the site.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Use cold milling, planning or grinding equipment with automatic grade controls capable of operating from stringline, and capable of removing part of pavement surface to depths or grades indicated.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Prior to beginning removal operation, inspect and verify with Departmental Representative areas, depths and lines of asphalt pavement to be removed.

.2 Protection: protect existing pavement not designated for removal and structures from damage. In event of damage, immediately make repairs to existing pavement and buildings to approval of Departmental Representative at no additional cost.

3.2 REMOVAL

.1 Remove existing asphalt pavement to lines and grades established in accordance with Drawing C-05 and approved by Departmental Representative in field.

.2 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.

3.2 REMOVAL (cont'd)

.3 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.

.4 Suppress dust generated by removal process.

3.3 FINISH TOLERANCES

.1 Finished surfaces in areas where asphalt pavement has been removed to be within +/-5 mm of grade specified but not uniformly high or low.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.

.2 Leave Work area clean at end of each day.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

.4 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.

.5 Waste Management: separate waste materials for recycling in accordance with Section 01 74 20.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Removed asphalt pavement which is to be recycled in hot mix asphalt concrete under this contract may be stockpiled at designated asphalt plant site.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

.1 Demolition of concrete aprons and concrete slab shall include all necessary labour, materials, and equipment required for the demolition/deconstruction, removal and disposal as specified and as identified on Drawing C-05.

1.2 MEASUREMENT PROCEDURES

.1 Provide unit price per tonne for demolitions, removals and disposals of existing concrete apron and concrete slab to limits indicated in Drawing C-05. Estimated quantity is 500 tonnes.

.1 Measurement shall be based on the net weight of concrete slabapron removed from the site and delivered to the disposal and/or recycling facility, and substantiated by certified weigh bills.

.2 Unit price shall include all labour, materials and equipment necessary to complete the Work.

.2 Concrete removal beyond limits specified will not be measured for payment. Make good all damages.

.3 If concrete is transported off site to be recycled for re-use, submit proof where the materials is being transferred to and the intent for recycling and re-use. Shipping documents must by supplied to Departmental Representative in a timely manner.

.4 If the concrete cannot be recycled and must be sent off site for landfilling, submit proof that all waste is being disposed of at a licensed MOECC land fill site or waste transfer site. A copy of the disposal/waste transfer site’s license and a letter verifying that said landfill site will accept the waste must be supplied to the Departmental Representative prior to removal of the waste from the site.

1.3 REFERENCES

.1 Canadian Standards Association (CSA) International:
.1 CSA S350-M1980(R2003), Code of Practice for Safety.

1.4 SUBMITTALS

.1 Waste Management submittals in accordance with 01 74 20 and 01 33 00.

.2 Utility Protection Plan submittals in accordance with Section 01 35 29 and 01 33 00.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 In accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Inspect the site with the Departmental Representative and verify the extent and location of items designated for removal, demolition, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing the site in operating condition.

3.2 PROTECTION

.1 Prevent movement, settlement or damage of adjacent parts of existing structure to remain. Make good damage and be liable for injury caused by demolition and removal.

3.3 DEMOLITION, REMOVALS AND DISPOSAL

.1 Neatly demolish and remove existing concrete apron and slab to limits indicated on Drawing C-05.

.2 At end of each day's work, leave Work in safe and stable condition.

.3 Protect parts not to be demolished from exterior elements at all times.

.4 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.5 Dispose of removed materials in accordance with Section 01 74 20.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Work Includes:

.1 DNAPL and arsenic contaminated soil removal and off-site disposal, dewatering, and placement of clean fill (both imported and derived from on-site sources). Site remediation includes:

.1 Remedial soil excavation, on-site management of soil and off-site disposal of both hazardous and non-hazardous soil impacted by volatile organic compounds (VOCs) and arsenic (non-hazardous) from the former Paint Shop and vicinity at the former Hangar 6. The area to be excavated is delineated and the depth and the inferred lateral extent of the excavations are defined as indicated in the drawings.

.2 Provide equipment and labour required for soil remediation.

.3 Transportation of all equipment, staff, clean fill, contaminated materials, to and from site as required.

.4 Co-ordination, supervision and preparation for remediation of contaminated soil.

.5 Provision and installation of materials and equipment necessary to remediate site.

.6 Implementation of safety work zones, temporary barriers, site Health and Safety Plans and Emergency Response Plans and other plans as required.

.7 Management of contaminated soil (hazardous and non-hazardous).

.8 Backfilling of the excavation with imported clean fill and non-contaminated soil generated as part of the remedial excavation (including geosynthetic clay liner placement at the base of the excavation), compaction, grading and site restoration in accordance with the relevant Sections.

1.1 SUMMARY (cont'd)

.9 Dewatering for duration of site remediation including installation of mobile water treatment system to treat water prior to discharge in accordance with Section 31 23 19.

.10 Management of contaminated waters generated during soil remediation work, including separation, recovery and elimination of free-phase DNAPL, VOCs, metals and total suspended solids (TSS) in accordance with Section 31 23 19.

.11 Dismantling facilities following acceptance of final report by Departmental Representative.

1.2 MEASUREMENT PROCEDURES

.1 Provide a lump sum price to excavate and stockpile site derived non-contaminated fill, in accordance with Drawings 7A, 7B and 7C, to the temporary on-site stockpiling area as indicated on Drawing C-02. The lump sum price shall include reinstatement and compaction of the site-derived, stockpiled non-contaminated fill as described in Section 31 00 01and upon completion of clay liner installation (refer to Section 31 32 19.02).

.1 Lump sum price shall include all labour, materials, and equipment necessary to complete the Work.

.2 Estimated quantity of material to be placed is 3,900 cubic metres.

.2 Unit Prices:

.1 Provide unit price per tonne to excavate, load, transport and dispose contaminated, non-hazardous soil. The estimated quantity of material to be removed is 5,800 tonnes.

.2 Provide unit price per tonne to excavate, load, transport and dispose of hazardous contaminated soil. The estimated quantity of material requiring removal and disposal is 1,250 tonnes.

.3 Measurement of contaminated, non-hazardous soil and hazardous soil shall be based on the net weight of contaminated soil delivered at the disposal facility, and substantiated by certified weigh bills.

1.2 MEASUREMENT PROCEDURES (cont'd)

.1 All contaminated soil shall be disposed of at an MOECC licensed facility.
.2 Unit price to include permits, certificate, quality assurance and quality control, establishment of safety work zones, equipment and labour and any other requirements to complete the work.
.4 Materials removed from beyond limits specified will be measured only when Departmental Representative authorizes additional excavation.
.5 Material managed beyond the estimated limits indicated above and/or on the Drawings will not be measured for payment.

1.3 REFERENCES

.1 Applicable environmental and health and safety laws and regulations for Province of Ontario, Municipal by-laws.

.2 American Society for Testing and Materials International (ASTM)
.1 ASTM D6980-12: Standard Test Method for Determination of Moisture in Plastics by Loss in Weight.

.3 Canadian Standards Association (CSA):
.1 CSA-A23.1-14/A23.2-14: Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
.2 CSA-A30000-13: Cementitious Materials Compendium.

.4 Ontario Provincial Standard Specifications (OPSS):
.1 OPSS 1004 November 2012, Material Specification for Aggregates – Miscellaneous.
.2 OPSS 1010 April 2013, Material Specification for Aggregates - Base, Subbase, Select subgrade, and Backfill Material.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Submit to Departmental Representative::
.1 Utility Protection Plan submittals in

1.4 SUBMITTALS (cont'd)

accordance with Section 01 35 29 and 01 33 00.

.2 Detailed excavation plan outlining facilities required, sloping requirements, any construction aids for structural support, or specific on-site professional personnel requirements (e.g. geotechnical engineer).

.3 Quality Assurance and Quality Control Submittals:

.1 Provide quality assurance and quality control submittals in accordance with Section 01 33 00 as follows:

.1 Description of emergency plans in case of breakdown, spill or other problem.

.2 Waste management plan and complete list of wastes, including waste registration numbers as required by provincial regulations that will be generated by activities.

.3 Methods that will be used to restore site to its original condition and applicable site criteria as mandated by the province.

.4 Closeout Submittals:

.1 Provide Closeout Submittals in accordance with Section 01 33 00 as follows:

.1 Provide written proof (weigh scale tickets) that contaminated soil has been sent to a facility authorized by MOECC for Province of Ontario.

1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Identify members of project team including project manager. Define experience, education and training, qualifications, tasks and responsibilities of each team member. Supply résumés of key technical and management staff. All on-site members must have reliability security clearance status.

.2 Regulatory Requirements:

.1 Perform work in accordance with:

.1 Acts, Regulations, Laws, guidelines

1.5 QUALITY ASSURANCE (cont'd)

codes of practice, directives and policies of government authorities pertaining to: environment; noise; water supply; waste water; air quality; health and safety; transportation; and waste management.

.2 CCME (Canadian Council of Ministers of the Environment) Contaminated sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

.3 WHMIS.

.4 Canadian Environmental Protection Act (New Substance Notification Regulations).

.5 Transportation of Dangerous Goods Act.

.3 Certifications: All analytical testing shall be completed through a Canadian Association for Laboratory Accreditation Inc. certified laboratory.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Contaminated Soil:

.1 Load the excavated contaminated soil (hazardous and non-hazardous) directly into dump trucks for off-site disposal. If excavated non-hazardous contaminated soil will be stored on Site, cover the soil with a liner to minimize the generation of contaminated runoff and underlay contaminated soil with flexible membrane to minimize or prevent leaching losses as indicated in Section 31 32 20. Transport and dispose of contaminated soil according to current provincial regulations.

.2 Store excavated non-contaminated soil only in areas as directed by Departmental Representative. Ensure no contact between non-contaminated excavated soil and drainage or contaminated water or soil.

.3 Segregate asphalt and concrete, and transport offsite to MOECC approved recycling facility in accordance with Section 01 74 20.

.4 Segregate granular materials for reuse in the final excavation.

.5 Segregated materials will be tested by

1.6 DELIVERY, STORAGE, AND HANDLING (cont'd)

Departmental Representative to confirm quality prior to re-use.

.2 New Materials and Equipment:
- .1 Ship, store and preserve in original packaging with manufacturer's seal and label remain intact.
- .2 Ensure materials and equipment are not damaged, altered or soiled during shipment, handling and storage.
- .3 Transport rejected equipment and materials from work site immediately.
- .4 Store materials and equipment according to manufacturer's and supplier's instructions.
- .5 Establish quality management system form materials and equipment.

1.7 PROJECT/SITE CONDITIONS

.1 Existing Conditions:
- .1 Review the attached appendices and drawings.

1.8 UTILITY LINES

.1 Before commencing work, Contractor to have completed public and private utility locates in order to establish location and extent of underground utility lines in area of excavation.
- .1 Contractor to notify Departmental Representative of work areas minimum 5 business days in advance of ground disturbance operations.
- .2 Existing hydro service located within the excavation footprint, as shown on Drawing C-04; shall be denergized by the Owner prior to ground disturbance for removal by the Contractor during excavation.
- .3 Protect all remaining utilities in accordance with Section 01 35 29 and Drawing C-04.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Stake out and record locations of maintained, re-routed and abandoned underground utility lines underground facilities such as cables, pipes, ducts and other services and utilities.

1.8 UTILITY LINES (cont'd)

.4 Make good damage to existing utility lines resulting from work at no incremental cost to Departmental Representative.

1.9 PERMITTING

.1 Contractor to obtain hot work permits and Base specific Master Dig permit, as issued from Departmental Representative, prior to start of any ground disturbance.
- .1 Contractor to submit an application for a DND Master Dig Permit 6 weeks in advance of anticipated construction start date.
- .2 Delays in Master Dig Permit should not result in extra costs.
- .3 Departmental Representative to provide copy of Master Dig permit to Contractor once issued.

.2 The Price provided for the work shall include obtaining all permits, certificates, QA/QC and approvals.

1.10 MAINTENANCE OF ACCESS ROADS

.1 Maintain access roads as follows:
- .1 Maintain and clean roads for duration of Work.
- .2 Repair damage incurred from use of roads.
- .3 Provide photographic documentation of roads used by construction vehicles before, during and after Work.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Geosynthetic clay liner: in accordance with Section 31 32 19.02.

.2 Contaminated Soil (hazardous and non-hazardous): excavate and remove daily as specified in paragraph 1.6.1.1.

.3 Existing asphalt surfaces, concrete slab and portions of non-reinforced concrete apron (0.4 m thick), to be demolished in accordance with relevant Sections.

2.2 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Trucks: clean meticulously between loads of hazardous contaminated soil, non-hazardous contaminated soil and clean imported fill. Clean meticulously at the end of the work day. Cover dump beds with tarpaulins during transportation. Use watertight dump beds for transporting contaminated soil.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Protection:
- .1 Keep excavation sites water free throughout work and manage recovered water according to contamination level and provincial, municipal and territory regulations.
- .2 Protect excavation from rainwater.
- .3 Provide temporary structures to divert flow of surface waters and snow melt run-off from excavation.

3.1 PREPARATION (cont'd)

- .4 Consult Departmental Representative regarding potential site specific geotechnical considerations.
- .5 Protect buried services that are required to remain undisturbed.
- .6 Provide safety measures to ensure worker and public safety.
- .7 Maintain sidewalls of excavation at a 1:1 slope and dewater excavation area prior to, and during, the course of remedial work in accordance with Section 31 23 19.

3.2 APPLICATION

.1 Soil Management:
- .1 Store, transport, and dispose off-site contaminated soil in accordance with applicable provincial standards, requirements and regulations.
- .2 Do not dilute contaminated soil with less contaminated soil.

3.2 APPLICATION (cont'd).2 Groundwater Management:

.1 In accordance with Section 31 23 19.

3.3 METHOD OF REMEDIATION

.1 The remediation of the contaminated soil shall be completed by removal of a portion of the existing concrete floor slab of former Hangar 6 at the limits of the excavation in accordance with Section 02 41 15 and as indicated on Drawing C-05, abandonment of twenty-two existing groundwater monitoring wells within the footprint of the excavation in accordance with Section 33 29 00, soil excavation to lateral extents and depths as indicated and disposal of contaminated soil (hazardous and non-hazardous) off-site at an MOECC licensed facility. The Departmental Representative shall direct the depth and lateral extent of the excavation. Sloping in accordance with Drawings 7A to 7D. Soil confirmation samples will be collected from the excavation walls by the Departmental Representative. The condition of the groundwater entering the excavation shall be monitored by the Departmental Representative. The Departmental Representative shall also monitor the groundwater treatment system and collect influent, mid-point and effluent samples at a frequency as stated in the Environmental Compliance Approval of the mobile system in accordance with Section 31 23 19. Upon confirmation sampling by the Departmental Representative, backfilling shall be completed using site derived stockpiled (non-contaminated) soil with the balance being imported fill material meeting generic CCME Canadian Soil Quality Guidelines (CEQG)and MOECC Table 3 Standards where no CCME guidelines exist unless otherwise directed by Departmental Representative, to re-instate grades to match the surrounding areas. Be responsible for sequencing and schedule of remedial excavation tasks outlined in Drawing C-08.

.2 Off-site disposal of contaminated soil.

.1 Soil removal and off-site disposal shall be completed by the Contractor and supervised by the Departmental Representative. Be responsible for schedule of contaminated soil removal.

3.3 METHOD OF REMEDIATION (cont'd)

.2 Copies of the disposal weight tickets shall be provided to the Departmental Representative.

.3 Removal and off-site disposal of contaminated soils in accordance with applicable federal and provincial regulations.

3.4 EXCAVATING

.1 Excavate to elevations and dimensions indicated or required for construction of work.

.2 Maintain sides and slopes of excavations in safe condition (1:1 slope minimum) or via alternative appropriate methods through provision of construction aids to offer structural support and/or on-site professional personnel (E.g. geotechnical engineer). All shall be in accordance with applicable health and safety regulations for the Province of Ontario.

.3 Make excavation to clean lines to minimize quantity of fill material required.

.4 When completed, the Departmental Representative shall inspect excavation to verify depth and dimension.

.5 Correct unauthorized excavation at no extra cost to Contract as directed by Departmental Representative.

.1 Excavation exceeding that shown in the drawings, if authorized in writing by the Departmental Representative, shall be paid as extra to Contract Price in accordance with general conditions. Quantities will be calculated in place, compaction included, truck load measurements not acceptable.

3.5 DEWATERING

.1 Excavation dewatering:

.1 In accordance with Section 31 23 19.

3.6 SEQUENCING

.1 Sequence the work as indicated in the drawings. This sequence is suggested and the proponent shall provide their own proposed sequence in the Work Plan submission.

.2 Protect wells and utilities to remain, as indicated in accordance with the appropriate Sections and on Drawing C-04. Complete the demolition and removal as indicated on Drawing C-05 and in accordance with Section 02 41 15, including concrete slab removal, portions of non-reinforced concrete apron and monitoring well decommissioning.

.3 Install dewatering system including wells and temporary water treatment system as indicated on Drawing C-06.

.4 Excavation to be completed in up to four lifts as indicated in the drawings and as directed by Departmental Representative. Non-contaminated soil shall be stockpiled. Contaminated soil shall be removed and disposed.

.1 Departmental Representative shall collect confirmatory wall samples and shall submit for laboratory analysis. If results indicate contaminated soil remains greater than the generic CCME Canadian Soil Quality guidelines(CEQG), Departmental Representative shall direct the Contractor for additional excavation. Departmental Representative shall take additional confirmatory wall samples for laboratory analysis. Backfilling of the excavated area shall commence when excavation completed to bedrock and wall soil samples satisfy CCME CEQG.

.2 Due to bedrock at the base of the excavation, no confirmatory floor samples shall be collected by the Departmental Representative.

.3 Soil stockpiled for reuse during the course of the excavation shall be sampled by the Departmental Representative at a rate of one sample per 160 cubic meter for verification prior to being used to backfill the excavation as part of site restoration.

.5 Remove and dispose of contaminated soil in accordance with this Section.

.6 Install geosynthetic clay liner to Section 31 32 19.02 and to details indicated on drawings.

END OF SECTION

3.6 SEQUENCING (cont'd)

.7 Complete backfilling in accordance with Section 31 00 01.

.8 Complete site restoration: asphalt pavement repairs to Section 32 12 16 and compaction in accordance with Section 31 00 01.

.9 Remove temporary water treatment system and dewatering system as part of site restoration, and inform Departmental Representative.

3.7 RESTORATION

.1 Backfill excavation in accordance with Section 31 00 01. Ensure confirmatory sampling results indicate that contaminant concentrations are in compliance with applicable CCME guidelines and MOECC Table 3 standards (in absence of CCME guidelines) prior to backfilling.

.2 Supply and place a geosynthetic clay liner (to Section 31 32 19.02) as indicated at the base of the excavation, prior to backfilling.

.3 Re-instate surface grading to give site same appearance as before remediation work.

.4 Clean permanent access roads of contamination resulting from project activity at request of Departmental Representative.

3.8 FIELD QUALITY CONTROL

.1 Site Tests:

.1 Departmental Representative to ensure leachate test results conform to provincial hazardous waste regulations.

.2 Departmental Representative to analyze soil samples to ensure compliance with federal/provincial/ municipal regulations, as required.

.3 Contractor to remove and replace non-compliant materials.

3.9 EQUIPMENT DECONTAMINATION

.1 Decontaminate equipment used in work in the designated area approved by the Departmental Representative and remove from site at end of work in accordance with Section 01 35 43.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 50 00 - Site Remediation.

1.2 REFERENCES

.1 Definitions:
- .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.2 Reference Standards:
- .1 Canadian Environmental Protection Act,1999 (CEPA 1999).
- .2 Department of Justice Canada (Jus)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
  - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

1.3 TRANSPORT AND HANDLING

.1 Transport hazardous materials and wastes to a Ministry of the Environment and Climate Change approved facility in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations. Waste will

1.3 TRANSPORT AND HANDLING (cont'd)

not be shipped over the Canadian border.

.2 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it is willing to and is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.3 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.4 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 NOT USED.

PART 3 - EXECUTION

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20 and Section 01 35 21.
  .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
  .2 Send hazardous waste for disposal or treatment at an MOECC licensed facility approved by Departmental Representative.
  .3 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
  .4 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
  .5 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 Backfilling and grading after removal and disposal of contaminated soil.

1.2 MEASUREMENT PROCEDURES

.1 Provide unit price per tonne to supply, deliver, place and compact Granular A to backfill the excavation. Estimated quantity of material to be placed is 840 tonnes. Measurement shall be based on the net weight of Granular A delivered to site and substantiated by certified weight bills from the aggregate supplier and shall include all labour materials, equipment necessary to complete the work. Compaction is considered incidental to the work and will not be measured separately for payment.

.2 Provide unit price per tonne to supply, deliver, place, and compact Granular B to backfill the excavation. Estimated quantity of material to be placed is 6,000 tonnes, however, the amount of material will be determined by bringing the final grade of the excavation area to existing grade after accounting for the paving material and Granular A specified herein. Measurement shall be based on the net weight of Granular B delivered to site and substantiated by certified weigh bills from the aggregate supplier and shall include all labour materials, equipment necessary to complete the work. Compaction is considered incidental to the work and will not be measured separately for payment.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics Soil Using Standard Effort (12,400 ft-lbf/ftý) (600 kN-m/mý).

1.3 REFERENCES (cont'd)

.2 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
- .1 OPSS 401 November 2010, Ontario Provincial Standard Specification, Construction Specification for Trenching, Backfilling, and Compacting.
- .2 OPSS 1004 November 2012, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
- .3 OPSS 1010 April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Proof of the source and quality of imported fill material to be used for backfilling. Departmental Representative will conduct verification sampling and sample results shall be provided of the material to be used as fill at a rate of one sample analysis result per 160 m3 of imported fill.

.3 Proof of compaction to requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Waste management in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular materials: to OPSS 1010 for:
- .1 Granular A, maximum size 19.0 mm.
- .2 Granular B, Type II, maximum size 26.5 mm.

2.1 MATERIALS (cont'd)

.2 Native fill: Previously excavated soil meeting generic CCME Canadian Soil Quality Guidelines (CEQG)and MOECC Table 3 Standards where no CCME guidelines exist. Free from: roots, rocks larger than 75 mm, debris and DNAPL contamination.

.3 All imported fill material to meet generic CCME Canadian Soil Quality Guidelines (CEQG)and MOECC Table 3 Standards where no CCME guidelines exist.

PART 3 - EXECUTION

3.1 PREPARATION/ PROTECTION

.1 Protect excavations from freezing, rainwater and snow melt.

.2 Keep excavations clean, free of standing water, and loose soil.

.1 Provide temporary structures to divert flow of surface waters from excavation.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

.6 Provide safety measures to ensure worker and public safety.

3.2 BACKFILLING

.1 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by Departmental Representative. Excess imported fill transported will not be paid.

.2 One sample per 160 cubic meters of excavated stockpiled material shall be collected and analyzed by Departmental Representative prior to placement as backfill material in the excavation

3.2 BACKFILLING (cont'd)

to validate that the material satisfies the applicable CCME Canadian Soil Quality Guidelines (CEQG). Backfill material that exceeds the applicable criteria cannot be re-used used as backfill and must be disposed in accordance with Section 02 50 00.

.1 Backfill that exceeds the applicable criteria that is delivered to the work area must be transported and replaced at contractor's expense.

.2 Contractor to help Departmental Representative in sample collection.

.3 One backfill sample per 160 cubic meters shall be collected and analyzed by Departmental Representative prior to delivering the material to the work area in order to validate that the material satisfies the applicable CCME Canadian Soil Quality Guidelines (CEQG). Backfill material that exceeds the applicable criteria cannot be brought onto the site to be used as backfill.

.1 Backfill that exceeds the applicable criteria that is delivered to the work area must be transported and replaced at contractor's expense.

.2 Contractor to help Departmental Representative in sample collection.

.4 Ensure backfill is not contaminated during transport to the work area.

.5 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.6 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill using tandem vibratory roller.

.1 Fill excavated areas with selected subgrade material and sand compacted as specified for fill.

.7 Place over previously installed geosynthetic clay liner as installed in accordance with Drawing C-10 and Section 31 32 19.02.

.8 Placing:

.1 Place stockpiled clean soil for re-use, following approval by Departmental Representative and imported clean backfill,

3.2 BACKFILLING (cont'd)

fill and base course material in 200 mm lifts, maximum: add water as required to achieve specified density.

.2 Restore the site in accordance with Drawing C-10 which provides details related to backfill requirements.

.3 Use methods to prevent disturbing or damaging any part of the work. Make good any damages.

.9 Place 150 mm compacted thickness of Granular A material below asphalt paving in accordance with Drawing C-10.

.10 Place a minimum of 350 mm compacted thickness of Granular B sub-base material compacted thickness below asphalt paving in accordance with Drawing C-10.

.11 Restore surface of excavation with material and finish to match existing adjoining surfaces in accordance with Section 32 12 16.

.12 Compaction: compact each layer of material to following densities for material to ASTM D698.
.1 To underside of basecourses: 98%.
.2 Basecourses: 100%.

.13 Under new paving:
.1 Use Granular B up to bottom of granular base courses.
.2 Use Granular A for base courses.

3.3 GRADING

.1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins, ditch, swale and other disposal areas approved by the Departmental Representative.

.2 Grade to a uniform slope with a tolerance of 1:120.

3.4 FIELD QUALITY CONTROL

.1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by Departmental Representative.
.1 Compaction testing results shall be submitted following of compaction as

3.4 FIELD QUALITY CONTROL (cont'd)

confirmation. If compaction test results do not meet the requirements under this Section, the Contractor shall re-compact to specified standard at own cost.

.2 Do not begin backfilling or filling operations until material has been approved for use by Departmental Representative (see 3.3.2).

.3 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.

3.5 SHORTAGE AND SURPLUS

.1 Supply necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance (see 3.3.2).

.2 Dispose of surplus material off site.

3.6 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Activities for which the Contractor shall be responsible and which are covered by this Section include:

- .1 Installation, operation and maintenance of dewatering system.
- .2 Installation, operation and maintenance of groundwater treatment system with sufficient treatment capacity to fully dewater the excavation zone and manage wash water from vehicle and equipment decontamination.
- .3 Management of contaminated waters generated during soil remediation work, including separation, recovery and elimination of free-phase DNAPL.
- .4 Storage of wastewater from excavation dewatering prior to treatment and storage of treated water following water treatment and prior to discharge.
- .5 Dismantling facilities following acceptance of final report by Departmental Representative.

1.2 MEASUREMENT PROCEDURES

.1 The supply and management of the dewatering system, including equipment and materials, operation and maintenance, replacements/modifications, repairs, etc. shall be included in the Lump Sum arrangement and will not be measured separately for payment.

.2 Supply and management of water treatment system, storage tanks and associated equipment and materials for dewatering, water treatment system and piping to the discharge point shall be included in the Lump Sum arrangement and will not be measured separately for payment.

- .1 Lump sum arrangement shall include the storage, transport and disposal of all recovered free-phase DNAPL product/residues generated by water treatment process in accordance with standards, requirements and regulations applicable in the Province of Ontario.

.3 Supply and operation of vacuum truck to remove residual DNAPL/product from bottom of excavation (i.e. bedrock surface) shall be included in the lump sum arrangement and will not be measured separately for payment.

1.3 REFERENCES

.1 Ontario Ministry of the Environment and Climate Change (MOECC):
.1 Provincial Water Quality Objectives (PWQO) - Table 2,1999.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Submit dewatering plan, including water treatment with shop drawings and design data including the following elements:
.1 The proposed type of dewatering system.
.2 Arrangement, location, and depths of system components including water and wastewater storage tanks.
.3 Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.
.4 Types and sizes of filters.
.5 Design calculations demonstrating adequacy of the proposed system and equipment.
.7 Methods of pumping for wastewater and treated water.
.8 Method of water quality monitoring.
.9 Type of filtration and chemical treatment of contaminated water, as applicable.
.10 Well point system design: submit design complete with calculations and shop drawings.
.11 Method of establishing and monitoring instruction site groundwater levels.
.12 Criteria for determining the acceptability of removing the dewatering system from operation.

.3 Within 10 working days of review by Departmental Representative of the shop drawing submittals for the water treatment system, prepare and submit three copies of the operations and maintenance (O&M) manual for the temporary water treatment system detailing the Contractor’s O&M activities.

1.5 WATER TREATMENT FACILITY

.1 Water Treatment Facility
.1 Submittals in accordance with Section 01 33 00. Approval by Departmental Representative does not relieve the Contractor from responsibility of providing design.
.2 Design and Operating Criteria: water treatment system capable of filtering water generated from dewatering excavations and work areas to meet

1.5 WATER TREATMENT FACILITY (CONT'D)_

discharge requirements of authority having jurisdiction, capable of removing volatile organic compounds, oil, suspended solids, particulates, and filter water through 5-micron particulate filter prior to discharge. Discharge criteria are Provincial Water Quality Objectives. The system should have sufficient treatment capacity to fully treat the groundwater extracted during the dewatering of the excavation zone and manage wash water generated from vehicle and equipment decontamination. Based on hydrogeological analysis of the site conditions, the capacity of the treatment system should be on the order of 100,000 litres/day. Detailed specifications of the dewatering and treatment system are defined in Section 31 23 19.

.3 Provide piping and pumps to transfer liquid/solid mixtures generated by dewatering operations which require water filtering to water filtering plant.

.4 Provide all associated piping and pumps to transfer liquid treated by water treatment plant to discharge point which is within 200 m of the Site, as shown on Drawing C-04.

.5 Water treatment operations capable of receiving liquid/solid mixtures and not causing delay to dewatering operations.

.6 Should effluent concentrations from the treatment facility not comply with required discharge criteria, contractor cannot discharge effluent and shall dispose off-site as hazardous waste at own cost.

.7 Piping: suitable material type, of sufficient diameter and structural thickness for purpose intended; satisfactorily tested for leaks with potable water in presence of Departmental Representative before handling wastewater.

.2 Installation:

.1 Provide labour, materials, and equipment and do work required for setup and construction of water filtering plant.

.2 Install component systems in accordance with installation procedures and as indicated.

.3 Following installation of system, implement initial operation test in accordance with procedures developed by Contractor and submitted to Departmental Representative for review.

.4 Install piping in accordance with manufacturer's instructions and test for leakage using potable water prior to commencing dewatering and filtering operations.

.3 Initial Testing: performance of water treatment system provided by Contractor will initially be determined

1.5 WATER TREATMENT FACILITY (CONT'D)_

by Departmental Representative.

.4 Operation:

.1 On basis of analytical results obtained by Departmental Representative, make system modifications required for effluent to satisfy effluent criteria, or continue with normal dewatering operations as directed by Departmental Representative.

.2 Operate water treatment system by experienced, qualified personnel in accordance with manufacturer's instructions and procedures submitted by Contractor and approved by Departmental Representative. Maintenance and cleanouts of filter media/treatment units is the responsibility of the Contractor. Contractor to pay for all maintenance and media replacement media.

.5 Decommissioning/Dismantling:

.1 Decontaminate and remove salvageable components of water treatment system including water filtering system, pumps, piping, and electrical equipment.

.2 Dispose of non-salvageable equipment and materials at approved off-site disposal facility. Decontaminate salvageable equipment within facility area as required prior to removal from site.

1.6 WATER AND WASTEWATER STORAGE TANKS

.1 Provide, operate, and maintain wastewater storage tanks to store wastewaters from excavation dewatering and decontamination works. The storage tanks should have sufficient capacity to store wastewater from excavation dewatering and decontamination works. Dewatering capacity is 100,000 L per day.

.1 Allow the Departmental Representative to collect wastewater samples from the wastewater storage tanks on daily basis or as filled and prior to treatment.

.2 Contractor to assist the Departmental Representative, as required in testing of water prior to, and after, treatment.

.3 Surface water or runoff from surface that contacts contaminated areas and required subsequent treatment is considered incidental and should not result in extra cost.

.2 Provide, operate, and maintain water storage tanks to store treated waters generated by Contractor's water treatment facility. The water storage tanks should have sufficient capacity to store treated water for the period required to analyze a water sample prior to discharge.

.1 Allow for 3 days after sample collection for

1.6 WATER AND WASTEWATER STORAGE TANKS (cont'd)

review of analytical results and for approval to discharge from the Departmental Representative.

.2 Do not discharge additional liquids to filled tank following sampling by Departmental Representative.

.3 Departmental Representative will determine appropriate disposition of treated water based on sample analysis.

.3 Allow for 45,000 L additional live/spare capacity to be available at all times. Incremental 45,000L live/spare capacity at all times is irrespective of any extra costs or equipment associated with any non-continuous operation of dewatering or water treatment due to insufficient dewatering or water treatment design or operation, insufficient water and wastewater storage capability, operation and maintenance, system malfunction/repairs, etc.

.1 Delays, extra equipment and costs due to non-continuous operation of dewatering, insufficient dewatering and water treatment design or operation or related activities will not result in extra costs.

.4 Discharges: comply with applicable discharge limitations and requirements; do not discharge wastewaters to site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain Departmental Representative's approval prior to discharge of wastewater. Receiving capacity of the storm water discharge point is 100,000 litres per day. Contractor to provide up to 200 m piping to storm water discharge point as indicated on Drawing C-04.

.5 Provide pumps and piping to convey collected treated water and wastewater to designated water and wastewater storage tanks.

.6 Install water and wastewater storage tanks in water treatment area as indicated on Drawing C-04.

.7 Connect pumps, piping, valves, miscellaneous items, and necessary utilities as required for operation of facilities; and protect tanks, valves, pumps, piping, and miscellaneous items from freezing.

.8 Do not operate water and wastewater storage tanks until inspected and approved by Departmental Representative.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Perform work in accordance with:

.1 Acts, Regulations, Laws, guidelines codes

1.7 QUALITY ASSURANCE (cont'd)

of practice, directives and policies of government authorities pertaining to: environment; noise; water supply; waste water; air quality; health and safety; transportation; and waste management.

.2 CCME Contaminated sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

.3 WHMIS.

.4 Transportation of Dangerous Goods Act.

.5 National Building Code of Canada 2015.

.6 National Fire Code of Canada 2015.

.7 Canadian Electrical Code 2015.

.8 Ontario Electrical Safety Code 2015, and all bulletins (Ontario).

1.8 OVERVIEW OF GROUNDWATER MANAGEMENT

.1 Dewatering of the excavation shall be completed via 66 well points positioned around the perimeter of the excavation as shown in Drawing C-06. Groundwater shall then be pumped to temporary aboveground storage tanks.

.2 The Contractor shall dewater the excavation for the duration and pumping rates required to perform the work.

.3 Dewatering system shall be in conformance with Federal, Provincial, and Municipal regulations.

.4 Water samples shall be collected by the Departmental Representative from the wastewater storage tanks on a daily frequency or as filled and prior to treatment.

.5 Water samples shall be collected by the Departmental Representative from the mid-point of the water treatment system from time to time.

.6 Effluent from the mobile treatment system will be discharged to holding tanks and further analytical testing will be completed by the Departmental Representative to assess compliance with applicable CCME and/or MOECC surface water quality guidelines/objectives.

.7 Contractor shall aid Departmental Representative in collection of all water samples.

PART 2 - PRODUCTS

2.1 PRODUCTS

.1 Dewatering system as supplied by the Vendor with dewatering pumps capable of pumping at a minimum combined rate of 100 L/min. The Contractor shall also maintain on site another set of standby pumps capable of pumping at a combined rate of 100 L/min.

.2 Dewatering well points:
- .1 Screens and riser pipes: Schedule (sch) 40, 100 mm (4") diameter polyvinyl chloride (PVC). Screen shall consist of 0.5 mm slots.
- .2 Filter pack comprising sand (sieve size # 00) placed in annular space along screened portion and water water-bearing zones above to 1 m from ground surface.
- .3 Bentonite pellets (10 mm size) to be placed in annular space 1 m below ground surface.
- .4 Well seal equipped with flexible swing joint connection, complete with valve.

.3 Manifold pipe: 150 mm (6") diameter high density polyethylene (HDPE) pipe.

.4 Water treatment system as supplied by the Vendor to treat water generated from dewatering, impacted with the exceedances of CCME EQG and/or MOECC provincial surface water quality objectives prior to discharge to the environment. Treatment parameters include total suspended solids and those listed in Tables C.1 to C.3 of Appendix C.
- .1 Contractor to ensure treatment system design to treat wastewaters with the following maximum reported VOC concentrations from previous investigations including an appropriate contingency:

VOC Parameter	Reported Max. Concentration(µg/L)
Chlorobenzene	12,000
Chloroform	39
1,2-Dichlorobenzene	39,000
1,3-Dichlorobenzene	3,900
1,4-Dichlorobenzene	5,600
Benzene	210

.5 Provide piping to transfer liquid/solid mixtures generated during dewatering operations which require water treatment.
- .1 Piping: suitable material type, of sufficient

2.1 PRODUCTS (CONT'D)_

diameter and structural thickness for purpose intended; tested for leaks with potable water in presence of Departmental Representative before processing impacted groundwater.

PART 3 - EXECUTION

3.1 APPLICATION/ SEQUENCING

.1 Sequencing of dewatering, water and waste storage and treatment in accordance with Drawing C-08.

.2 Groundwater Management:
.1 Capture groundwater using well points installed at locations as indicated on Drawing C-06.

.3 Install equipment necessary for recovery of free product (less or more dense than water) and pumping of groundwater.

.4 Treat groundwater which contains contaminants in excess of applicable CCME EQG and/or MOECC surface water quality guidelines/ objectives prior to discharge to the storm sewer at the location indicated.

.5 Free-phase DNAPL is anticipated in pumped groundwater and shall be collected in the phase-water separator, as required.

.6 Store, transport, and dispose off-site residues, including collected DNAPL, generated by water treatment process in accordance with standards, requirements and regulations Province of Ontario.

3.2 DEWATERING

.1 General site dewatering:
.1 Dewater various parts of Work including, without limitation, excavations and work areas.
.2 Employ construction methods and precautions that ensure Work, including excavations, are stable and dry.
.3 Take precautions necessary to protect excavations from flooding due to surface runoff.

.2 Excavation dewatering:
.1 Install dewatering well points and pumps at locations indicated to maintain groundwater levels over the entire excavation a minimum of

3.2 DEWATERING (cont'd)

1 m below the excavation grade (bedrock at approximately 4 m below ground surface).

.2 Do not pump water containing particles of suspended solids and DNAPL into waterways, sewers or drainage systems as per government regulations.

.3 Pump extracted groundwater to above ground wastewater storage tanks installed upstream of the water treatment system.

.4 Treat water stored in wastewater tanksfor safe discharge to the Base's storm trench discharge location as shown in Drawing C-04 and according to instructions of Departmental Representative.

.5 Water generated by dewatering activities should not be allowed to infiltrate back into the ground in close proximity to the work area, and not discharged such that it would flow into any surface water body, either directly or by flowing overland.

.6 Departmental Representative shall maintain an operations log book to document treatment system operation.

.7 Remove residual groundwater and/or DNAPL from the bottom of the excavation on by vacuum truck and as directed by Departmental Representative.

3.3 WATER TREATMENT

.1 Initial Start-up and Testing: After mobilization and set-up of the water treatment system, perform system start-up and testing activities prior to full-scale operation. Start-up/testing shall be in accordance with the Vendor's recommendations.

.2 Start-up and testing stages:

.1 Mechanical shakedown:

.1 Use potable water to verify the correct operation of automated equipment and make any potential repairs as required.

.2 Initial start-up:

.1 Use extracted groundwater from one of the upstream holding tanks once dewatering system is operational, and perform an initial run of the water treatment system.

.2 Discharge treated water to one of the downstream holding tanks.

3.3 WATER TREATMENT (cont'd)

.3 Departmental Representative shall monitor the system and collect water samples at various stages of the treatment process including the influent, mid-point and effluent. Treated water from the downstream holding tank shall only be discharged to the Base's storm discharge trench (as indicated on Drawing C-04) upon approval from Departmental Representative pending analytical results of the effluent sample(s).

.3 Operations and Maintenance:

.1 Maintenance of the water treatment system shall be performed in accordance with the Vendor's recommendations and O&M manual submitted under this Section.

3.4 RESTORATION

.1 Remove dewatering system, water treatment system and holding tanks upon the completion of remedial work, and as directed by the Departmental Representative.

.2 Decontaminate and remove salvageable components of the dewatering system and water treatment system.

.3 Well points to be decommissioned in accordance with Section 33 29 00.

3.5 FIELD QUALITY CONTROL

.1 Site Tests:

.1 Departmental Representative to conduct water quality monitoring and sampling of the water treatment system to ensure compliance with provincial regulations, as required.

.2 The water treatment system shall be shut-down in the event of non-compliant effluent water until corrective actions are implemented.

.1 If treatment system shut-down, contractor must maintain enough storage capacity to not delay dewatering of excavation at no additional cost and on top of the requirement of having 45,000L additional live/spare capacity available at all times as described in Section 1.6.
If non-compliance is related to water treatment design, materials, installation, operations and/or maintenance of the treatment operations that do not comply with contract specifications then take corrective actions as necessary to maintain specified treatment performance.

.2 Make no claims for delays associated with maintenance, repairs or delays to correct performance of the water treatment system.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 The unit pricing of the Geosynthetic Clay Liner (GCL) will be measured in place. The Geosynthetic Clay Liner is approximately 2,000 square meters. The unit rate for measured in place quantities shall be inclusive of allowance for waste, overlap, and anchoring. Waste, overlap and anchoring requirements shall not be measured separately for payment. Final measured in place quantities will be payable in accordance with Drawing C-10.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM):

- .1 ASTM D4632/D4632M-08(2015)a, Grab Breaking Load and Elongation of Geotextiles
- .2 ASTM D4643-17, Determination of Water (Moisture) Content of Soil by Microwave Oven Heating.
- .3 ASTM D5084-16a, Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
- .4 ASTM D5261-10, Measuring Mass per Unit Area of Geotextiles.
- .5 ASTM D5993-14, Measuring Mass Per Unit of Geosynthetic Clay Liners.
- .6 ASTM D5888-06 (2016), Standard Guide for Storage and Handling of Geosynthetic Clay Liners.
- .7 ASTM D6102-15, Standard Guide for Installation of Geosynthetic Clay Liners.
- .8 ASTM D6768-04 (2015)e2, Standard Test Method for Tensile Strength of Geosynthetic Clay Liners.
- .9 ASTM D5887-16, Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 The GCL installer shall provide to Departmental Representative sufficient evidence of installation experience and competence with the specified geosynthetic materials. The GCL installer shall demonstrate a minimum of 100,000 square metres of installation experience and competence with other geosynthetics or shall demonstrate an acceptable level of training and supervision will be utilized in order to ensure the quality of the installation.

.3 Product Data:

.1 Submit manufacturer's name, address, trademark, model, catalogue numbers,instructions, printed product literature and data sheets for GCL and include product characteristics, performance criteria, physical size, finish and limitations.

.4 Samples:

.1 Submit to Departmental Representative 2 weeks minimum before beginning Work samples as follows:

.1 Minimum 300 mm x 300 mm samples of GCL.

.5 Certificates:

.1 Submit 2 copies of manufacturer's test data 2 weeks minimum before beginning Work.

.6 Indicate installation layout, dimensions and details, including seams, anchor trenches and protrusion details. Proof of procurement method.

1.4 QUALITY ASSURANCE

.1 Test quality of membrane to ensure consistency of raw material and geomembrane consistency of raw material and geomembrane.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.5 DELIVERY, STORAGE AND HANDLING (cont'd)

.3 Storage and Handling Requirements:
- .1 Store materials in accordance with manufacturer's recommendations and in accordance with ASTM D5888.
- .2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse of pallets, crates, padding and packaging materials.

1.6 SITE CONDITIONS

.1 Do not install in standing water or in rain.

PART 2 - PRODUCTS

2.1 MATERIAL

.1 Geotextile: needle-punched reinforced geosynthetic clay liner.
- .1 Supplied in:
  - .1 Rolls of 5 m minimum width.
  - .2 Composed of uniform layer of sodium bentonite clay between a scrim reinforced nonwoven buttom geotextile and a staple fiber nonwoven geotextile.

.2 Geosynthetic clay liner physical properties:
- .1 Geotextile:
  - .1 Cap, nonwoven, 200g/m2 MARV (Maximum Average Roll Values), to ASTM D5261.
  - .2 Scrim, nonwoven, 200g/m2 MARV, to ASTM D5261.
- .2 Bentonite:
  - .1 Moisture content: maximum 12%, to ASTM D4643.

.3 Finished geosynthetic clay liner:
- .1 Bentonite mass per unit area: 3.66kg/m2 MARV, to ASTM D5993.
- .2 Tensile strength: 8.8 kN/m MARV, to ASTM D6768.
- .3 Peel strength: 65 M min, to ASTM D4632.
- .4 Permeability: maximum 5x10-9cm/sec, to ASTM D5887.

.4 Acceptable material: Bentofix Thermal Lock

2.1 MATERIAL (cont'd)

"SRNWL" Geosynthetic Clay Liner, manufactured by Terrafix Geosynthetics, Inc., www.terrafixgeo.com, 416-674-0363

.5 Seams: Use loose granular bentonite to seal the entire overlap seam, in accordance with manufacturer's recommendations and ASTM D6102. Any accessory bentonite used for sealing seams, penetrations, or repairs, shall be the same granular bentonite as used in the production of the GCL itself.

PART 3 – EXECUTION

3.1 MANUFACTURER'S INSTRUCTION

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 The surfaces to be lined shall be free of any debris, vegetation, roots, sticks, sharp rocks, or other deleterious materials larger than two inches as well as free of any voids, large cracks or standing water or ice.

.2 The surface upon which the GCL material will be installed shall be approved by Departmental Representative prior to placement of the GCL.

.3 Install panel placement and seaming in accordance with manufacturer's recommendations on graded surface in orientation and locations indicated:
- .1 Install in accordance with ASTM D6102.
- .2 Install with nonwoven side up to maximize shear strength characteristics.

.4 Provide a minimum overlap of 300 mm at edge seams and 600 mm at end seams. A 230 mm lap line and a 300 mm match line shall be imprinted on both edges of the upper geotextile component of the GCL to assist in installation overlap quality control. Lines shall be printed as continuous dashes in easily observable non-toxic ink. Seal

3.2 INSTALLATION (CONT'D)

full width of overlap by placing granular bentonite between panels in quantities as recommended by manufacturer. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.

.5 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

.6 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.

.7 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

.8 Departmental Representative to approve installation of membrane and seams.

.9 Repair minor tears and pinholes by patching. Patches to be made of same GCL material, and extend minimum of 300 mm beyond edge of defect.

3.3 COVER

.1 The uncovered edge of GCL panels shall be protected at the end of the working day with a waterproof sheet secured adequately with ballast.

.2 Equipment: Soil cover shall be placed with low ground pressure equipment. Avoid damaging the GCL by making sharp turns or pivots with equipment as well as sudden starts or stops.

.3 Placement: Soils may be placed on the GCL by pushing with a track dozer or by carefully placing it with a loader or a back-hoe. The use of scrapers or pans directly over the GCL is strictly prohibited.

.4 Thickness: A minimum thickness of 300 mm cover shall be kept between heavy equipment and the GCL at all times, except when final-grading.

.5 No heavy vehicles shall be driven directly on the GCL until the proper thickness of cover has been placed.

3.3 COVER (cont'd)

.6 Compaction: To prevent damage to the GCL, the initial lift(s) of soil cover shall not be compacted in excess of 85 percent Modified Proctor density.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

.3 Waste Management: separate waste materials for reuse and recycling.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Do not permit vehicular traffic directly on membrane.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation of geomembranes for use in soil remediation as an impermeable membrane.

1.2 MEASUREMENT AND PAYMENT

.1 Lump sum arrangement shall include delivery, installation, maintenance and removal of geomembranes for the decontamination pad in accordance with Section 01 35 43 and stockpiling areas as indicated on Drawing C-02. No allowance will be made for seams and overlaps.

1.3 REFERENCES

.1 ASTM International

.1 ASTM D 638-04(2015)el, Standard Test Method for Tensile Properties of Plastics.

.2 ASTM D 746-13, Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.

.3 ASTM D814-95(2014), Standard Test Method for Rubber Property-Vapor Transmission of Volatile Liquids.

.4 ASTM D 1004-13, Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

.5 ASTM D1434-82(2015)e1, Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting.

.6 ASTM D4833/D4833M-07(2013)e1, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

.7 ASTM D5199-12, Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

.8 ASTM D5596-03(2016), Standard Test Method For Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.

1.3 REFERENCES (cont'd)

.9 ASTM D5885/D5885M-15, Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.

.10 ASTM D5397 - 07(2012), Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.

.11 ASTM D5617-04(2015), Standard Test Method for Multi-Axial Tension Test for Geosynthetics.

.12 ASTM D6392-12, Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

.13 ASTM D7238-06(2012), Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus.

1.4 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit to Departmental Representative following samples at least 2 weeks prior to beginning Work.

.1 Minimum 2 m length of standard width membrane.

.3 Submit manufacturer's instructions, printed product literature and data sheets for geomembrane and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 CERTIFICATES

.1 Submit to Departmental Representative copies of manufacturer's mill test data at least 4 weeks prior to start of work.

.2 Submit to Departmental Representative certificates, including test results, at least 2 weeks prior to delivery to job site.

1.6 QUALITY ASSURANCE

.1 Test quality of geomembrane in accordance with manufacturer's recommendations.

1.7 DELIVERY, STORAGE AND HANDLING

.1 During delivery and storage, protect geomembranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt,dust, debris and rodents.

.2 Storage and Handling Requirements:
- .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 11 06.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Geomembrane: extruded synthetic sheet.
- .1 Supplied in:
  - .1 Rolls of 4.7 m minimum width.
  - .2 Panels length of 45.7 m minimum.
- .2 Composed of fortified skin layers with special stabilizers providing enhanced heat,UV stability and chemical resistance and a specialized blended polyolefin alloy core layer.

.2 Physical properties:
- .1 Thickness (ASTM D5199): Avg. thickness must

2.1 MATERIALS (cont'd)

exceed value with no individual reading lower than 10%. 1.50 m (60 mil; 0.060 inches).

.2 Maximum Membrane Density (ASTM D792 or ASTM D1505): ≤ 0.939 g/cc.

.3 Minimum Tensile Properties (ASTM D638 or ASTM D6693): Machine direction and perpendicular to machine direction average values on the basis of five (5) test specimens each direction:

.1 Break Strength: 42.0 kN/m (240 lb/in).

.2 Break Elongation: 700%.

.4 Minimum Tear Resistance (ASTM D1004): 150 N (33 lbs).

.5 Minimum Puncture Resistance (ASTM D4833): 370 N (84 lbs).

.6 Carbon Black Contents: 2.0 - 3.0% to ASTM D1603.

.7 Carbon Black Dispersion (ASTM D5596):

.1 Carbon Black dispersion for 10 different views;

.2 Minimum nine views in categories 1 or 2 and 1 view in Category 3.

.8 High pressure Oxidative Induction Time (ASTM D5885):

.1 Skin: >2500 minutes.

.2 Core: >2000 minutes.

.9 Stress Crack Resistance Under Constant Load (ASTM D5397):

.1 Minimum 1000 hours.

.10 UV Resistance (ASTM 7238):

.1 Minimum 90% strength retained after 1600 hours testing.

.11 Axi-Symmetric Break Resistance (ASTM D5617)

.1 Minimum: 80%

.12 Methane Permeability (ASTM D1434)

.1 Transmission Rate: <1.78x10-4 m3/(m2 per day)

.13 Solvent Vapour Transmission ASTM D814):

.1 ASTM Fuel c : < 3.58 g/(m2 per hr)

.2 Ethanol : < 0.03 g/(m2 per hr)

.3 Methanol : < 0.02 g/(m2 per hr)

.4 ASTM Fuel H : < 2.42 g/(m2 per hr)

.14 Seam Properties (Shop and Field Seams -ASTM D6392):

.1 Shear Strength: 15.7 kN/m (90 lb/in)

.2 Peel Strength: 13.0 kN/m (75 lb/in)

2.1 MATERIALS (cont'd)

.3 Seams: welded in accordance with manufacturer's recommendations.

.1 Physical properties for resin used for welding are same as those for resin used in manufacture of membrane.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Ensure surface finished to not impair installed membrane.

.2 Surface to provide firm, unyielding surface with no sharp changes or abrupt breaks in grade.

.3 Ensure surfaces to be lined are smooth, free of foreign and organic material, sharp objects, or debris of any kind.

.5 Prepare mechanical attachments according to ASTM D6497 Standard Guide for Mechanical Attachment of Geomembrane to Penetrations or Structures.

3.2 INSTALLATION

.1 Maintain area of installation free of water, snow accumulations and obstructions.

.2 Prepare excessively soft supporting material as directed by Departmental Representative.

.3 Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (i.e. fog, dew), nor in presence of high winds.

.4 Place geotextile material by unrolling within the proposed soil stock pile area, as indicated, in an orientation and manner that facilitates the work. Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

3.2 INSTALLATION (CONT'D)

.5 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

.6 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.

.7 For installation as part of temporary soil stockpiles place soil for future use in accordance with Section 02 50 00.

.8 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

3.3 CLEANING

.1 Remove construction debris, including surplus or damaged/unused geomembrane, from the site and dispose of off-site in accordance with federal, provincial and local regulations.

3.4 PROTECTION

.1 Do not permit vehicular traffic directly on membrane.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT PROCEDURES

.1 Payment for asphalt tack coats to be included in the unit price for asphalt paving in accordance with Section 32 12 16. Re-asphalting area is indicated on Drawing C-10.

1.2 REFERENCES

.1 ASTM International (ASTM)
- .1 ASTM D140/D140M-16, Standard Practice for Sampling Bituminous Materials.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-16.2-(M89), Emulsified Asphalts, Anionic Type, for Road Purposes.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt tack coat and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
- .1 Submit two - 1 L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth jars to Departmental Representative, at least 2 weeks prior to beginning Work.
- .2 Sample asphalt tack coat material to: ASTM D140/D140M.
- .3 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work to ASTM D140/D140M.

1.4 QUALITY ASSURANCE

.1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt prime material meets requirements of this Sections.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:
.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

.3 Deliver, store and handle materials in accordance with ASTM D140/D140M.

.4 Provide, maintain and restore asphalt storage area.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Anionic emulsified asphalt: to CAN/CGSB-16.2, grade: SS-1.

.2 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

.1 Equipment required for Work of this Section to be in satisfactory working condition and maintained for duration of Work.

.2 Pressure distributor:
.1 Designed, equipped, maintained and operated so that asphalt material can be:
.1 Maintained at even temperature.
.2 Applied uniformly on variable widths of surface up to 3 m.
.3 Applied at readily determined and

2.2 EQUIPMENT (cont'd)

controlled rates from 0.2 to 5.4 L/mý with uniform pressure, and with allowable variation from any specified rate not exceeding 0.1 L/mý.

.4 Distribute in uniform spray without atomization at temperature required.

.2 Equipped with meter, registering travel in metres per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.

.3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.

.4 Equipped with easily read, accurate and sensitive device which registers temperature of liquid in reservoir.

.1 Measure temperature to closest whole number.

.5 Equipped with accurate volume measuring device or calibrated tank.

.6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.

.7 Equipped with nozzle spray bar, with operational height adjustment in increments of 0.6 metres and capable of being raised or lowered.

.8 Cleaned if previously used with incompatible asphalt material.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed

3.1 EXAMINATION (CONT'D)

under other Sections or Contracts are acceptable for asphalt tack coat installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discover.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 APPLICATION

.1 Apply asphalt tack coat only on clean and dry surface in accordance with Drawing C-10.

.2 Dilute asphalt emulsion with water at 1:1 ratio for application.

.1 Mix thoroughly by pumping or other method approved by Departmental Representative.

.3 Apply asphalt tack coat evenly to pavement surface at rate not to exceed 0.57 L/mý.

.4 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.

.5 Apply asphalt tack coat only when air temperature greater than 105 degrees C and when rain is not forecast within 2 hours minimum of application.

.6 Apply asphalt tack coat only on unfrozen surface.

.7 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.

.8 Keep traffic off tacked areas until asphalt tack coat has set.

.9 Re-tack contaminated or disturbed areas as directed by Departmental Representative.

.10 Permit asphalt tack coat to set break before placing asphalt pavement.

3.2 APPLICATION (CONT'D)

.11 Submit summary report within 7 days minimum of date of application and include information as follows:
- .1 Total area tack coated.
- .2 Quantity of tack coat used.
- .3 Mean application rate.
- .4 Actual product quantity used when using equipment on pressure distributors.
- .5 Dipstick measurements or electronic printouts are acceptable.

.12 Carry out measurements in presence of Departmental Representative upon request.

.13 Inspect tack coat application to ensure uniformity.
- .1 Re-spray areas of insufficient or non-uniform tack coat coverage as directed by Departmental Representative.
- .2 Ensure tack coating performed using hand held devices is consistent in appearance with adjacent areas of machine applied material.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT PROCEDURES

.1 Payment for asphalt tack coats to be included in the unit price for asphalt paving in accordance with Section 32 12 16. Re-asphalting area is indicated on Drawing C-10.

1.2 REFERENCES

.1 ASTM International (ASTM)
- .1 ASTM D140/D140M-16, Standard Practice for Sampling Bituminous Materials.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt prime coat and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Departmental Representative/Consultant or Owner will supply materials.

.3 Samples:
- .1 Submit two 1 L samples of asphalt prime proposed for use in new, clean, air tight sealed, wide mouth, jars or bottles made with plastic to Departmental Representative, 2 weeks prior to commencing Work.
- .2 Sample asphalt prime coat materials in accordance with ASTM D140/D140M.
- .3 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140/D140M.

1.4 QUALITY ASSURANCE

.1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt prime material meets requirements of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .1 Arrange points of delivery and quantity to be shipped with vendor.
- .2 Make deliveries during normal work hours.
- .3 Include copy of orders and instructions respecting shipment upon request by Departmental Representative.
- .4 Include suitable unloading facilities and unload asphalt as directed by Departmental Representative.
- .5 Provide, maintain and restore asphalt storage area.

.2 Storage and Handling Requirements:
- .1 Deliver, store and handle materials to ASTM D140/D140M.
- .2 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIAL

.1 Asphalt material: to CAN/CGSB-16.2 grade: SS-1.

.2 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.

.3 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

.1 Pressure distributor:

.1 Designed, equipped, maintained and operated so that asphalt material can be:

.1 Maintained at even temperature.

.2 Applied uniformly on variable widths of surface up to 5 m.

.3 Applied at controlled rates from 0.2 to 5.4 L/mý with uniform pressure, and allowable variation from any specified rate not exceeding 0.1 L/mý.

.4 Distributed in uniform spray without atomization at temperature required.

.2 Equipped with meter registering travel distance in metres per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.

.3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator.

.1 Pump power unit to be independent of truck power unit.

.4 Equipped with easily read, accurate and sensitive device which registers temperature of liquid in reservoir.

.1 Temperature to be measured to nearest whole number.

.5 Equipped with accurate volume measuring device or calibrated tank.

.6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.

.7 Equipped with nozzle spray bar, with operational height adjustment in increments of 0.6 metres and capable of being raised or lowered.

.8 Cleaned if previously used with incompatible asphalt material.

.2 Aggregate Spreader:

.1 Apply blotter sand to primed surfaces using roll type spreader, or rotating disc sander capable of applying aggregate at variable widths and at variable rates.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt prime coat installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 APPLICATION

.1 Proceed with application of tack coat only after receipt of written approval of granular base surface from Departmental Representative.

.2 Anionic emulsified asphalt:
- .1 Dilute asphalt emulsion with clean water at 1:1 ratio for application.
- .2 Mix thoroughly by pumping or other method approved by Departmental Representative.
- .3 Apply diluted asphalt emulsion at rate 3 L/mý.
- .4 Apply diluted asphalt emulsion on damp surface unless otherwise directed by Departmental Representative.

.3 Apply asphalt prime only on unfrozen surface.

.4 Apply asphalt tack coat only when air temperature is greater than 105 degrees C and when rain is not forecast within 2 hours minimum of application.

.5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt prime material.

3.2 APPLICATION (cont'd)

.6 Where traffic is to be maintained, treat no more than one-half width of surface in one application.

.7 Prevent overlap at junction of applications.

.8 Do not prime surfaces that will be visible when paving is complete.

.9 Apply additional material to areas not sufficiently covered as directed by Departmental Representative.

.10 Keep traffic off primed areas until asphalt prime has cured set.

.11 Permit prime to cure set before placing asphalt paving.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Asphalting area in accordance with Drawing C-10. This section covers the materials and construction requirements for hot mix asphalt (HMA) paving.

1.2 MEASUREMENT AND PAYMENT

.1 Provide unit price per square metre to prepare, apply, compact and finish area indicated on Drawing C-10 with asphalt paving. Estimated area is 2,500 square metres.
- .1 Unit price to include tack coats requirements in accordance with Section 32 12 13.16.
- .2 Unit price to include prime coats requirements in accordance with Section 32 12 13.23.
- .3 Asphalt applied beyond limits specified in Drawing C-10 will not be measured for payment unless approved by Departmental Representative.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1 -88, Sieves Testing, Woven Wire, Inch Series.

.2 Ontario Provincial Standard Specification (OPSS).
- .1 OPSS 310, Construction Specification for Hot Mix Asphalt (November 2012).
- .2 OPSS 1003 - Material Specification for Aggregates - Hot Mix Asphalt (November 2006).
- .3 OPSS 1101 - Material Specification for Performance Graded Asphalt Cement (November 2014).
- .4 OPSS 1150, Material Specification for Hot Mix Asphalt (November 2010).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 The Contractor shall be responsible for all sampling, testing, analysis and reporting for the

1.4 ACTION AND INFORMATIONAL SUBMITTALS (cont'd)

selection of materials and the preparation of mix designs for the required submissions. The Contractor shall use qualified technicians and appropriately certified laboratories for any testing involved. The Departmental Representative will make the work site available to the Contractor to inspect the site.

.3 Submit asphalt concrete mix design and trail mix test results to Departmental Representative for review at least 4 weeks prior to beginning Work.

1.5 HOT MIX ASPHALT MATERIALS AND MIX DESIGN WORK

.1 Prior to starting Work, the Contractor shall supply the Departmental Representative with Material Safety Data Sheets (MSDS) for all materials to be incorporated in the Work.

.2 The job mix formula (JMF) shall be submitted to the Departmental Representative at least 14 calendar days prior to the start of operations with the mix type, and shall include as a minimum for each mix type all documentation required by OPSS 1150 - Material Specification for Hot Mix Asphalt.

.3 No hot-mix asphalt of a mix type shall be produced for payment until the Contractor's job mix formula for the mix type has been approved by the Departmental Representative. The Departmental Representative will complete the job mix formula review for a mix type within 7 calendar days

.4 The approved job mix formula for a hot-mix asphalt mixture shall be in effect until a Contractor technically supported request for minor adjustments, if any, is approved by the Departmental Representative. Should a change in source or properties of materials be required, a new job mix formula submission for the mix type must be approved by the Departmental Representative before the change is made.

1.6 QUALITY CONTROL

.1 While the Departmental Representative will make the results of Quality Assurance (QA) testing available to the Contractor, the Contractor shall be responsible for the necessary quality control testing and adjustments to product uniform, acceptable hot-mix asphalt mixes and pavements

1.6 QUALITY CONTROL (cont'd)

in conformance with the Contractor requirements.

.2 The Contractor shall conduct such process control inspection, sampling and testing as is necessary to ensure that any hot-mix asphalt aggregates and hot-mix asphalt are in conformance with the Contract requirements. No payment will be made for asphalt paving until satisfactory quality control test results have been submitted by the Contractor.

.3 The Contractor's quality control testing program shall be in accordance with OPSS 310 and OPSS 1003.

PART 2 - PRODUCTS

2.1 MATERIALS GENERAL REQUIREMENTS

.1 Unless otherwise specified in the Contract, the Contractor shall supply all materials necessary for the execution and completion of the Work.

2.2 AGGREGATES

.1 Aggregates shall be in accordance with OPSS 1003.

2.3 ASPHALT CEMENT

.1 Performance Graded Asphalt Cement (PGAC) conforming to the requirements of OPSS 1101. Grade as follows:
.1 Surface Course: 70-28 PMA (polymer modified).
.2 Binder Course: 64-28.

.2 The asphalt cement shall be homogeneous, free of water and any contamination and shall not foam when heated to the temperatures specified by the manufacturer for safe handling and use of the product. It shall be shipped, used and handled

2.3 ASPHALT CEMENT (cont'd)

at all times in accordance with the manufacturer's specifications.

.3 For each grade of asphaltic cement specified in the Contract, the Contractor shall supply to the Departmental Representative, test results and if requested two 1 litre samples for the products proposed for use to demonstrate compliance to the requirements at least 20 calendar days prior to the first use of the product.

.4 The Contractor shall also concurrently provide the applicable mixing and compaction temperatures for each product, and documentation of construction, storage and handling requirements, including material safety data sheet, re-compaction temperature, mix discharge temperature and recommended extraction procedure.

.5 The Contractor shall provide the Departmental Representative with the asphalt cement supplier's certified test report for each lot of asphalt cement shipped to the work site.

2.4 HOT MIX ASPHALT

.1 Hot mix asphalt mixtures shall be in accordance with OPSS 1150 as follows:

.1 HL 3 Asphalt - To OPSS, Specification No. 1150.

.2 HL 8 Asphalt - To OPSS, Specification No. 1150.

2.5 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers:

.1 Minimum drum diameter: 750 mm.

.2 Maximum amplitude of vibration (machine setting): 0.5mm for lifts less than 40 mm thick.

2.5 EQUIPMENT (cont'd)

.4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
- .1 Boxes with tight metal bottoms.
- .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
- .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .4 Use only trucks which can be weighed in single operation on scales supplied.

.5 Hand tools:
- .1 Suitable hand tools.

2.6 MIX DESIGN

.1 Mix design to be approved by Departmental Representative.

.2 Mix design to OPSS 310 and type as specified in the contract documents.

.3 The use of RAP (PROCESSED RECLAIMED ASPHALT PAVEMENT) is not permitted.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Process with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.1 EXAMINATION (CONT'D)

3.2 PREPARATION

.1 Apply prime coat and tack coat in accordance with Section 32 12 13.23 and Section 32 12 13.16 prior to paving.

.2 Prior to laying mix, clean surfaces of loose and foreign material.

3.3 PLACING

.1 Obtain Departmental Representative's approval of base and existing surface and tack coat and prime coat prior to placing asphalt.

.2 Place asphalt concrete to thicknesses, grades and lines as indicated and as directed by Departmental Representative.

.1 Any areas not indicated on the drawing will be made on extra work basis in accordance with contract documents. Contractor to submit unit price. Any extra areas needs to be approved by Departmental Representative prior to executing.

.3 Placing conditions:

.1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.

.2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.

.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.4 Place asphalt concrete in compacted lifts of thickness as follows:

.1 Surface course in layers of maximum 60 mm each.

.5 Minimum 135°C mix temperature required when spreading.

.6 Maximum 160°C mix temperature permitted at anytime.

3.4 COMPACTING

.1 Do not change rolling pattern unless mix changes or lift thickness changes.
- .1 Change rolling pattern only as directed by Departmental Representative.

.2 General:
- .1 Provide at least 2 rollers and as many additional rollers as necessary to achieve specified pavement density. When more than 2 rollers are required, 1 roller must be pneumatic tired type.
- .2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.
- .3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.
- .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.
- .5 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.
- .6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
- .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
- .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
- .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.
  - .1 Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.
- .10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
- .11 Where rolling causes displacement of

3.4 COMPACTING (cont'd)

material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

.3 Intermediate rolling:
- .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
- .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.

.4 Finish rolling:
- .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks.
  - .1 If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by Departmental Representative.
  - .2 Conduct rolling operations in close sequence.

3.5 JOINTS

.1 General:
- .1 Remove surplus material from surface of previously laid strip.
  - .1 Do not deposit on surface of freshly laid strip.
- .2 Construct joints between asphalt concrete pavement and Portland cement concrete pavement as indicated.
- .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

.2 Transverse joints:
- .1 Offset transverse joint in succeeding lifts by at least 600 mm.
- .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
- .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent

3.5 JOINTS (cont'd)

rounding of compacted surface at joints.

.3 Longitudinal joints:
.1 Offset longitudinal joints in succeeding lifts by at least 150 mm.
.2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.
.1 If cold joint cannot be avoided, cut back by saw cutting previously laid lane, by at least 150 mm, to full depth vertical face, and tack face with thin coat of hot asphalt of adjacent lane.
.3 Overlap previously laid strip with spreader by 25 to 50 mm.
.4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
.5 Roll longitudinal joints directly behind paving operation.
.6 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.

3.6 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.7 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.
.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

3.7 DEFECTIVE WORK (CONT'D)

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.8 TESTING

.1 While the Departmental Representative may make the results of Quality Assurance (QA) testing available to the Contractor, the Contractor shall be responsible for the necessary quality control testing and adjustments to produce uniform, acceptable hot-mix asphalt mixes and pavements in conformance with the Contract requirements.

.2 The Contractor shall conduct such progress control inspection, sampling and testing as is necessary to ensure that any hot-mix asphalt aggregates and hot-mix asphalt are in conformance with the Contract requirements. No payment will be made for asphalt paving until satisfactorily quality control test results have been submitted by the Contractor.

.3 The Contractor's quality control testing program shall be in accordance with OPSS 310 and OPSS 1003.

.4 Quality Assurance (QA) testing by the Departmental Representative will be in accordance with OPSS 310.

3.9 PROTECTION

.1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38°C. Do not permit stationary loads on pavement until 24 hours after placement.

.2 Provide access to buildings as required. Arrange paving schedule so as not to interfere with normal use of premises.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11.

.1 Leave Work area clean at end of each day.

3.10 CLEANING (CONT'D) .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Section includes decommissioning of:
- .1 22 Monitoring wells as indicated as indicated on Drawing C-05.
- .2 66 Well points associated with the dewatering system as indicated on Drawing C-06.

1.2 PAYMENT PROCEDURES

.1 The unit price for decommissioning a well includes all work, ie. mobilization, demobilization, all equipment, labour, supply and disposal of all material and compaction for decommissioning and is to be included in the appropriate unit or lump sum prices.

.2 For all wells, measure well diameter, depth to bottom of well, depth to water from ground level, record on MOECC Abandonment Well Record and provide a copy to Departmental Representative.

1.3 DEFINITIONS

.1 Annular space: space between well casing and borehole wall.

.2 Aquifer: part of formation or group of formations that is water bearing.

.3 Consolidated formation: a geologic formation of bedrock.

.4 Drawdown: difference in elevation, between static level and pumping level.

.5 Potable water: water that is safe for human consumption.

.6 Unconsolidated formation: geologic formation of sand, gravel or other soil strata.

.7 Well datum: top of outer casing or similar fixed point of well head with elevation tied to geodetic

1.3 DEFINITIONS (cont'd)

or suitable local datum.

1.4 SUBMITTALS

.1 Prior to the award of this Contract, the Contractor must provide the Departmental Representative with a copy of the well contractor and technician licenses, as required by the Ontario MOE O. Reg. 903, as amended.

.2 On completion of Work, submit to Departmental Representative:

.1 Water Well Record for each well abandoned, including Global Positioning System coordinates for well location.

.3 Upon completion of work, Contractor shall distribute copies of completed well record to:

.1 Director of the Ministry of Environment and Climate Change within 30 days of the abandonment of well.

1.5 QUALIFICATIONS

.1 Well decommissioning work shall be undertaken by a MOECC licensed well drilling contractor.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for off-site disposal, reuse and or recycling in accordance with Section 01 74 20 as required.

1.7 PROJECT CONDITIONS

.1 The properties may or may not be occupied. Contractor must be considerate of the tenant and maintain access for the tenant.

.2 Overhead wires, structures, trees, etc. may restrict access to the work area.

.3 Public and private utilities shall be verified prior to ground disturbance. Master Dig permit needs to be issued by the Base and complied with.

1.8 WORK SCHEDULE

.1 All wells must be decommissioned prior to the commencement of work within the work area.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Well abandonment plug material: to O. Reg. 128/04903, as amended - Wells.

.2 Clean fill material: to O. Reg. 128/03903, as amended - Wells.

PART 3 - EXECUTION

3.1 REVIEW OF AVAILABLE INFORMATION

.1 Refer to the drawings for locations of wells to be decommissioned in the work area and attached bore hole logs.

3.2 INSTALLATION

.1 The well decommissioning work must be completed by licensed well drilling contractor. Decommission the existing wells on site as per O. Reg. 128/03903, as amended and as directed by Departmental Representative. Information on the existing wells to be decommissioned can be found in the bore hole logs included as an attachment to the specifications. Contractor must co-ordinate the well decommissioning with the Departmental Representative.

.2 Well tag, if present, shall be removed and safeguarded until required.

.3 Remove and dispose of all equipment and debris in the well.

3.3 CLEAN UP

.1 Contractor is responsible for ensuring that each property is left in equivalent or better condition upon completion of the Work at each property.

END OF SECTION

TABLE 1 **SOIL ANALYTICAL RESULTS**
Waste Characterization
Soil Cuttings from Detailed Site Investigation - Hangars 5 & 6
8 Wing CFB Trenton, Ontario

SLE Sample No.	MDL	Units	O.Reg. 347 Criteria[1]	SOIL CUTTINGS-1	SOIL CUTTINGS-2
Laboratory Sample No.	na	na	na	*NE3837*	*OJ7727*
Sampling Date	na	na	na	*20/04/2012*	*2/Aug/12*
TCLP Analysis					
Inorganics:					
Arsenic	0.2	mg/L	2.5	<	<
Barium	0.2	mg/L	100	0.6	0.6
Boron	0.1	mg/L	500	0.1	0.1
Cadmium	0.05	mg/L	0.5	<	<
Chromium	0.1	mg/L	5	<	<
Lead	0.1	mg/L	5	<	<
Mercury	0.001	mg/L	0.1	<	
Selenium	0.1	mg/L	1	<	<
Silver	0.01	mg/L	5	<	<
Uranium	0.01	mg/L	10	<	<
Organics:					
Benzene	0.020	mg/L	0.5	<	<
Carbon Tetrachloride	0.020	mg/L	0.5	<	<
Chlorobenzene	0.020	mg/L	8	<	<
Chloroform	0.020	mg/L	10	<	<
1,2-Dichlorobenzene	0.050	mg/L	20	<	<
1,4-Dichlorobenzene	0.050	mg/L	0.5	<	<
1,2-Dichloroethane	0.050	mg/L	0.5	<	<
1,1-Dichloroethylene	0.020	mg/L	1.4	<	<
Methyl Ethyl Ketone	1.0	mg/L	200	<	<
Methylene Chloride	0.20	mg/L	5	<	<
PCBs (total)	0.003	mg/L	0.3	<	<
Tetrachloroethylene	0.020	mg/L	3	<	<
Trichloroethylene	0.020	mg/L	5	<	<
Vinyl Chloride	0.020	mg/L	0.2	<	<
Bulk Soil Analysis					
Benzene	0.005	µg/g	nc	<	<
Toluene	0.02	µg/g	nc	<	<
Ethylbenzene	0.01	µg/g	nc	<	<
o-Xylene	0.02	µg/g	nc	<	0.02
p+m-Xylene	0.04	µg/g	nc	<	0.06
Total Xylenes	0.04	µg/g	nc	<	0.08
F1 PHC (C6-C10)	10	µg/g	nc	<	<
F1 PHC (C6-C10) - BTEX	10	µg/g	nc	<	<
F2 PHC (C10-C16)	10	µg/g	nc	<	<
F3 PHC (C16-C34)	10	µg/g	nc	<	63
F4 PHC (C34-C50)	10	µg/g	nc	<	13
Flashpoint		ºC	nc	NF/NI	NF/NI

MDL	method detection limit
<	less than MDL
<###	less than adjusted DL (###)
TCLP	Toxicity Characteristic Leaching Procedure
na	not applicable
nc	no criterion
mg/L	milligrams per litre
µg/g	micrograms per gram
[1]	Ontario Regulation 347, General - Waste Management, Schedule 4 Leachate Quality Criteria
BOLD	Exceeds O.Reg. 347 leachate quality criterion

TABLE 4.2.8 Soil Analytical Results - Waste Characterization
Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		Leachate Quality Criteria[1]	TCLP-1	TCLP-2	TCLP-3
	Laboratory Sample ID			L1891999-11	L1891999-12	L1891999-13
	Sample Location			TCLP-1	TCLP-2	TCLP-3
	Sampling Date (yyyy/mm/dd)			2017/02/16	2017/02/16	2017/02/16
Parameter	**RDL**	**Units**				
Inorganics						
Arsenic	0.050	mg/L	2.5	< 0.050	< 0.050	< 0.050
Barium	0.50	mg/L	100	0.71	0.52	< 0.50
Boron	2.5	mg/L	500	< 2.5	< 2.5	< 2.5
Cadmium	0.0050	mg/L	0.5	0.0055	< 0.0050	< 0.0050
Chromium	0.050	mg/L	5	< 0.050	< 0.050	< 0.050
Mercury	0.00010	mg/L	0.1	< 0.00010	< 0.00010	< 0.00010
Lead	0.050	mg/L	5	< 0.050	< 0.050	< 0.050
Mercury	0.00010	mg/L	0.1	< 0.00010	< 0.00010	< 0.00010
Selenium	0.025	mg/L	1	< 0.025	< 0.025	< 0.025
Silver	0.0050	mg/L	5	< 0.0050	< 0.0050	< 0.0050
Uranium	0.25	mg/L	10	< 0.25	< 0.25	< 0.25
Semi-Volatiles						
Benzo(a)pyrene	0.00020	mg/L	0.001	<0.00020	<0.00020	<0.00020
2-Methylphenol	0.0050	mg/L	200	<0.0050	<0.0050	<0.0050
3&4-Methylphenol	0.010	mg/L	200	<0.010	<0.010	<0.010
Cresols (total)	0.0150	mg/L	200	<0.015	<0.015	<0.015
2,4-Dichlorophenol	0.0050	mg/L	90	<0.0050	<0.0050	<0.0050
2,4-Dinitrotoluene	0.0040	mg/L	0.13	<0.0040	<0.0040	<0.0040
Hexachlorobenzene	0.0040	mg/L	0.13	<0.0040	<0.0040	<0.0040
Hexachlorobutadiene	0.0040	mg/L	0.5	<0.0040	<0.0040	<0.0040
Hexachloroethane	0.0040	mg/L	3	<0.0040	<0.0040	<0.0040
Nitrobenzene	0.0040	mg/L	2	<0.0040	<0.0040	<0.0040
Pentachlorophenol	0.0050	mg/L	6	<0.0050	<0.0050	<0.0050
Pyridine	2.0	mg/L	5	<2.0	<2.0	<2.0
2,3,4,6-Tetrachlorophenol	0.0050	mg/L	10	<0.0050	<0.0050	<0.0050
2,4,5-Trichlorophenol	0.0050	mg/L	400	<0.0050	<0.0050	<0.0050
2,4,6-Trichlorophenol	0.0050	mg/L	0.5	<0.0050	<0.0050	<0.0050
Volatiles						
Carbon Tetrachloride	0.025	mg/L	0.5	< 0.025	< 0.025	< 0.025
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025
Chloroform	0.10	mg/L	10	< 0.10	< 0.10	< 0.10
1,2-Dichlorobenzene	0.025	mg/L	20	< 0.025	0.105	< 0.025
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	0.025	mg/L	0.5	< 0.025	< 0.025	< 0.025
1,1-Dichloroethylene	0.025	mg/L	1.4	< 0.025	< 0.025	< 0.025
Methylene Chloride	0.50	mg/L	5	< 0.50	< 0.50	< 0.50
Methyl Ethyl Ketone	1.0	mg/L	200	< 1.0	< 1.0	< 1.0
Tetrachloroethylene	0.025	mg/L	3	< 0.025	< 0.025	< 0.025
Trichloroethylene	0.025	mg/L	5	< 0.025	< 0.025	< 0.025
Vinyl Chloride	0.050	mg/L	0.2	< 0.050	< 0.050	< 0.050
Benzene	0.025	mg/L	0.5	< 0.025	< 0.025	< 0.025

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by ALS, Mississauga, ON
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
na - Not applicable
mg/L - milligrams per litre

BOLD Concentration greater than Leachate Quality Criteria

[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

TABLE 2 TCLP Soil Analytical Results - Select VOCs
AEC#3 - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-169 L1880798-2 BH17-169-2 1.0 - 2.0 2017/01/17	BH17-169 L1880798-7 BH17-169-3 2.0 - 3.0 2017/01/17	BH17-169 L1880798-8 BH17-169-4 3.0 - 4.0 2017/01/17	BH17-170 L1880798-10 BH17-170-3 2.0 - 3.0 2017/01/17	BH17-170 L1880798-11 BH17-170-4 3.0 - 4.0 2017/01/17	BH17-173 L1880798-16 BH17-173-3 2.0 - 3.0 2017/01/17	BH17-174 L1881507-1 BH17-174-3 2.0 - 3.0 2017/01/18	BH17-174 L1881507-2 BH17-174-4 3.0 - 4.0 2017/01/18	BH17-175 L1881507-11 BH17-175-2 1.0 - 2.0 2017/01/18	BH17-175 L1881507-12 BH17-175-2D 1.0 - 2.0 2017/01/18 Duplicate of BH17-175-2
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	0.493	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	< 0.025	19.2	12.8	0.409	0.044	0.080	0.492	0.315	0.086	0.071
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	**1.26**	**0.868**	< 0.025	< 0.025	< 0.025	0.036	< 0.025	< 0.025	< 0.025

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-175 L1881507-3 BH17-175-3 2.0 - 3.0 2017/01/18	BH17-175 L1881507-4 BH17-175-4 3.0 - 4.0 2017/01/18	BH17-176 L1881507-5 BH17-176-3 2.0 - 3.0 2017/01/18	BH17-176 L1881507-6 BH17-176-4 3.0 - 4.0 2017/01/18	BH17-176 L1881507-7 BH17-176-4D 3.0 - 4.0 2017/01/18 Duplicate of BH17-176-4	BH17-177 L1881507-48 BH17-177-4 3.0 - 4.0 2017/01/18	BH17-178 L1881507-49 BH17-178-3 2.0 - 3.0 2017/01/18	BH17-181 L1881507-17 BH17-181-3 2.0 - 3.0 2017/01/18	BH17-182 L1881507-19 BH17-182-3 2.0 - 3.0 2017/01/18	BH17-183 L1881507-36 BH17-183-2 1.0 - 2.0 2017/01/18
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	0.077	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.027
1,2-Dichlorobenzene	0.025	mg/L	20	0.212	1.76	0.039	1.80	1.29	0.060	< 0.025	< 0.025	0.076	0.183
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	0.158	< 0.025	0.187	0.143	< 0.025	< 0.025	< 0.025	< 0.025	0.032

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-183 L1881507-28 BH17-183-3 2.0 - 3.0 2017/01/18	BH17-184 L1881507-30 BH17-184-3 2.0 - 3.0 2017/01/18	BH17-184 L1881507-31 BH17-184-4 3.0 - 4.0 2017/01/18	BH17-189 L1881930-21 BH17-189-4 3.0 - 4.0 2017/01/19	BH17-194 L1881930-32 BH17-194-2 1.0 - 2.0 2017/01/19	BH17-194 L1881930-37 BH17-194-3 2.0 - 3.0 2017/01/19	BH17-194 L1881930-38 BH17-194-4 3.0 - 4.0 2017/01/19	BH17-196 L1881930-42 BH17-196-2 1.0 - 2.0 2017/01/19	BH17-196 L1881930-49 BH17-196-3 2.0 - 3.0 2017/01/19	BH17-196 L1881930-50 BH17-196-4 3.0 - 4.0 2017/01/19
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	0.222	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.030	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.168	17.3	0.160	0.053	< 0.025	0.058	< 0.025	< 0.025	0.223	0.032
1,4-Dichlorobenzene	0.025	mg/L	0.5	0.036	**1.70**	0.027	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.034	< 0.025

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by ALS, Mississauga, ON
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - meter below ground surface
mg/L - milligrams per litre
BOLD Concentration greater than Leachate Quality Criteria
[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

TABLE 2 **TCLP Soil Analytical Results - Select VOCs**
AEC#3 - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-197 L1881930-52 BH17-197-4 3.0 - 4.0 2017/01/19	BH17-198 L1881930-53 BH17-198-3 2.0 - 3.0 2017/01/19	BH17-198 L1881930-54 BH17-198-4 3.0 - 4.0 2017/01/19	BH17-201 L1881930-71 BH17-201-4 3.0 - 4.0 2017/01/19	BH17-201 L1881930-72 BH17-201-4D 3.0 - 4.0 2017/01/19 Duplicate of BH17-201-4	BH17-202 L1882391-1 BH17-202-1 0 - 1.0 2017/01/20	BH17-202 L1882391-2 BH17-202-2 1.0 - 2.0 2017/01/20	BH17-202 L1882391-9 BH17-202-3 2.0 - 3.0 2017/01/20	BH17-202 L1882391-10 BH17-202-4 3.0 - 4.0 2017/01/20	BH17-203 L1882391-4 BH17-203-2 1.0 - 2.0 2017/01/20
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	0.215	< 0.10	< 0.10	< 0.025	0.049	0.073	0.027	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.281	0.180	**66.9**	< 0.10	< 0.10	< 0.025	< 0.025	0.204	7.30	< 0.025
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	< 0.025	**3.64**	< 0.10	< 0.10	< 0.025	< 0.025	0.098	**0.645**	< 0.025

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-203 L1882391-11 BH17-203-3 2.0 - 3.0 2017/01/20	BH17-203 L1882391-12 BH17-203-4 3.0 - 4.0 2017/01/20	BH17-204 L1882391-6 BH17-204-2 1.0 - 2.0 2017/01/20	BH17-204 L1882391-13 BH17-204-3 2.0 - 3.0 2017/01/20	BH17-208 L1882391-31 BH17-208-4 3.0 - 4.0 2017/01/20	BH17-209 L1882391-23 BH17-209-1 0 - 1.0 2017/01/20	BH17-209 L1882391-24 BH17-209-2 1.0 - 2.0 2017/01/20	BH17-209 L1882391-32 BH17-209-3 2.0 - 3.0 2017/01/20	BH17-209 L1882391-33 BH17-209-4 3.0 - 4.0 2017/01/20	BH17-210 L1882391-26 BH17-210-2 1.0 - 2.0 2017/01/20
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025	< 0.10	< 0.10	< 0.025	< 0.025	< 0.10	< 0.10	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.233	0.213	0.076	< 0.10	0.10	< 0.025	< 0.025	< 0.10	< 0.50	0.069
1,4-Dichlorobenzene	0.025	mg/L	0.5	0.041	0.026	< 0.025	< 0.10	< 0.10	< 0.025	< 0.025	< 0.10	< 0.10	< 0.025

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-210 L1882391-34 BH17-210-3 2.0 - 3.0 2017/01/20	BH17-211 L1882391-38 BH17-211-2 1.0 - 2.0 2017/01/20	BH17-211 L1882391-39 BH17-211-3 2.0 - 3.0 2017/01/20	BH17-211 L1882391-40 BH17-211-4 3.0 - 4.0 2017/01/20	BH17-212 L1890330-41 BH17-212-2 1.0 - 2.0 2017/02/13	BH17-212 L1890330-42 BH17-212-3 2.0 - 3.0 2017/02/13	BH17-212 L1890330-43 BH17-212-4 3.0 - 4.0 2017/02/13	BH17-213 L1890330-45 BH17-213-2 1.0 - 2.0 2017/02/13	BH17-213 L1890330-46 BH17-213-3 2.0 - 3.0 2017/02/13	BH17-213 L1890330-47 BH17-213-3D 2.0 - 3.0 2017/02/13 Duplicate of BH17-213-3
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.10	< 0.025	< 0.10	< 0.10	< 0.025	0.092	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.11	< 0.025	0.20	< 0.10	< 0.025	**26.0**	0.439	< 0.025	0.465	4.90
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.10	< 0.025	< 0.10	< 0.10	< 0.025	**3.92**	0.028	< 0.025	0.062	**0.623**

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by ALS, Mississauga, ON
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - meter below ground surface
mg/L - milligrams per litre
BOLD Concentration greater than Leachate Quality Criteria
[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

TABLE 2 **TCLP Soil Analytical Results - Select VOCs**
AEC#3 - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-213 L1890330-48 BH17-213-4 3.0 - 4.0 2017/02/13	BH17-213 L1890330-49 BH17-213-4D 3.0 - 4.0 2017/02/13 Duplicate of BH17-213-4	BH17-214 L1890330-25 BH17-214-2 1.0 - 2.0 2017/02/13	BH17-214 L1890330-26 BH17-214-3 2.0 - 3.0 2017/02/13	BH17-214 L1890330-27 BH17-214-4 3.0 - 4.0 2017/02/13	BH17-215 L1890330-31 BH17-215-4 3.0 - 4.0 2017/02/13	BH17-219 L1890330-23 BH17-219-4 3.0 - 4.0 2017/02/13	BH17-222 L1890330-10 BH17-222-2 1.0 - 2.0 2017/02/13	BH17-222 L1890330-11 BH17-222-3 2.0 - 3.0 2017/02/13	BH17-222 L1890330-12 BH17-222-3D 2.0 - 3.0 2017/02/13 Duplicate of BH17-222-3
Sample Location / Laboratory Sample ID / SNC-Lavalin Sample ID / Depth Interval (mbgs) / Sampling Date (yyyy/mm/dd)													
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.25	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	11.1	0.311	< 0.025	0.402	0.305	0.067	0.109	0.159	0.061	< 0.025
1,4-Dichlorobenzene	0.025	mg/L	0.5	**0.73**	0.031	< 0.025	0.033	< 0.025	< 0.025	< 0.025	0.027	< 0.025	< 0.025

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-222 L1890330-13 BH17-222-4 3.0 - 4.0 2017/02/13	BH17-223 L1890330-15 BH17-223-2 1.0 - 2.0 2017/02/13	BH17-223 L1890330-16 BH17-223-3 2.0 - 3.0 2017/02/13	BH17-223 L1890330-17 BH17-223-3D 2.0 - 3.0 2017/02/13 Duplicate of BH17-223-3	BH17-223 L1890330-18 BH17-223-4 3.0 - 4.0 2017/02/13	BH17-223 L1890330-19 BH17-223-4D 3.0 - 4.0 2017/02/13 Duplicate of BH17-223-4	BH17-224 L1890330-37 BH17-224-2 1.0 - 2.0 2017/02/13	BH17-224 L1890330-38 BH17-224-3 2.0 - 3.0 2017/02/13	BH17-227 L1890917-10 BH17-227-2 1.0 - 2.0 2017/02/14	BH17-227 L1890917-11 BH17-227-3 2.0 - 3.0 2017/02/14
Sample Location / Laboratory Sample ID / SNC-Lavalin Sample ID / Depth Interval (mbgs) / Sampling Date (yyyy/mm/dd)													
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.098	0.507	0.629	0.435	0.088	0.155	< 0.025	0.962	< 0.025	0.149
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	0.109	0.125	0.085	< 0.025	< 0.025	< 0.025	0.242	< 0.025	0.042

Parameter	RDL	Units	Leachate Quality Criteria[1]	BH17-228 L1890917-14 BH17-228-2 1.0 - 2.0 2017/02/14	BH17-228 L1890917-15 BH17-228-3 2.0 - 3.0 2017/02/14	BH17-238 L1890917-36 BH17-238-4 3.0 - 4.0 2017/02/14	BH17-239 L1890917-40 BH17-239-4 3.0 - 4.0 2017/02/14	BH17-241 L1890917-46 BH17-241-2 1.0 - 2.0 2017/02/14	BH17-241 L1890917-47 BH17-241-3 2.0 - 3.0 2017/02/14	BH17-241 L1890917-48 BH17-241-4 3.0 - 4.0 2017/02/14	BH17-242 L1890917-50 BH17-242-2 1.0 - 2.0 2017/02/14	BH17-243 L1890917-54 BH17-243-2 1.0 - 2.0 2017/02/14	BH17-243 L1890917-55 BH17-243-3 2.0 - 3.0 2017/02/14
Sample Location / Laboratory Sample ID / SNC-Lavalin Sample ID / Depth Interval (mbgs) / Sampling Date (yyyy/mm/dd)													
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.366	< 0.025	0.794	0.930	< 0.025	0.026	0.130	0.109	< 0.025	0.032
1,4-Dichlorobenzene	0.025	mg/L	0.5	0.025	< 0.025	0.040	0.064	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by ALS, Mississauga, ON
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - meter below ground surface
mg/L - milligrams per litre
BOLD Concentration greater than Leachate Quality Criteria
[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

TABLE 2 TCLP Soil Analytical Results - Select VOCs
AEC#3 - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

Sample Location			Leachate Quality Criteria[1]	BH17-244	BH17-244	BH17-245	BH17-245	BH17-245	BH17-245	BH17-245	BH17-247	BH17-248	BH17-248
Laboratory Sample ID				L1891592-2	L1891592-3	L1891592-6	L1891592-7	L1891592-8	L1891592-9	L1891592-10	L1891592-21	L1891592-16	L1891592-17
SNC-Lavalin Sample ID				BH17-244-2	BH17-244-3	BH17-245-2	BH17-245-3	BH17-245-3D	BH17-245-4	BH17-245-4D	BH17-247-3	BH17-248-2	BH17-248-3
Depth Interval (mbgs)				1.0 - 2.0	2.0 - 3.0	1.0 - 2.0	2.0 - 3.0	2.0 - 3.0	3.0 - 4.0	3.0 - 4.0	2.0 - 3.0	1.0 - 2.0	2.0 - 3.0
Sampling Date (yyyy/mm/dd)				2017/02/15	2017/02/15	2017/02/15	2017/02/15	2017/02/15 Duplicate of BH17-245-3	2017/02/15	2017/02/15 Duplicate of BH17-245-4	2017/02/15	2017/02/15	2017/02/15
Parameter	**RDL**	**Units**											
Volatiles													
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	< 0.025	0.196	< 0.025	0.272	0.125	1.21	0.394	< 0.025	< 0.025	0.110
1,4-Dichlorobenzene	0.025	mg/L	0.5	< 0.025	0.056	< 0.025	0.036	< 0.025	0.114	< 0.025	< 0.025	< 0.025	0.028

Sample Location			Leachate Quality Criteria[1]	BH17-249	BH17-250	BH17-251
Laboratory Sample ID				L1891592-27	L1891592-31	L1891592-35
SNC-Lavalin Sample ID				BH17-249-3	BH17-250-3	BH17-251-3
Depth Interval (mbgs)				2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Sampling Date (yyyy/mm/dd)				2017/02/15	2017/02/15	2017/02/15
Parameter	**RDL**	**Units**				
Volatiles						
Chlorobenzene	0.025	mg/L	8	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	0.025	mg/L	20	0.298	0.033	0.055
1,4-Dichlorobenzene	0.025	mg/L	0.5	0.081	< 0.025	< 0.025

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by ALS, Mississauga, ON
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
mbgs - meter below ground surface
mg/L - milligrams per litre
BOLD Concentration greater than Leachate Quality Criteria
[1] Ontario Regulation 347 as amended. "Waste Management". Schedule 4 Leachate Quality Criteria.

TABLE 4.10 SOIL ANALYTICAL RESULTS
Waste Characterization - Borehole Samples
8 Wing CFB Trenton - New Hangars 5 and 6

SLE Sample No.	MDL	Units	O.Reg. 347 Criteria[1]	BH12-12 (8-10)	BH12-28 (2-4)	BH12-35 (1-2)	BH12-46B (2-4)
Laboratory Sample No.	na	na	na	*NF9059*	*NE5355*	*NE6982*	*NF9016*
Sampling Date	na	na	na	*25-Apr-12*	*20-Apr-12*	*19-Apr-12*	*24-Apr-12*
TCLP Analysis							
Inorganics:							
Arsenic	0.2	mg/L	2.5	<	<	<	<
Barium	0.2	mg/L	100	0.3	0.9	0.5	0.7
Boron	0.1	mg/L	500	0.1	0.2	0.2	<
Cadmium	0.05	mg/L	0.5	<	<	<	<
Chromium	0.1	mg/L	5	<	<	<	<
Cyanide, free		mg/L	20				
Fluoride		mg/L	150				
Lead	0.1	mg/L	5	<	<	<	<
Mercury	0.001	mg/L	0.1	<	<	<	<
Nitrate + Nitrite (as N)		mg/L	1000				
Selenium	0.1	mg/L	1	<	<	<	<
Silver	0.01	mg/L	5	<	<	<	<
Uranium	0.01	mg/L	10	<	<	<	<
Organics:							
Benzene	0.020	mg/L	0.5	<	<	<	<
Benzo[a]pyrene	0.04	mg/L	0.001				
Carbon Tetrachloride	0.020	mg/L	0.5	<	<	<	<
Chlorobenzene	0.020	mg/L	8	<	0.066	<	<
Chloroform	0.020	mg/L	10	<	<	<	<
1,2-Dichlorobenzene	0.050	mg/L	20	<	<	<	<
1,4-Dichlorobenzene	0.050	mg/L	0.5	<	<	<	<
1,2-Dichloroethane	0.050	mg/L	0.5	<	<	<	<
1,1-Dichloroethylene	0.020	mg/L	1.4	<	<	<	<
Methyl Ethyl Ketone	1.0	mg/L	200	<	<	<	<
Methylene Chloride	0.20	mg/L	5	<	<	<	<
PCBs (total)	0.003	mg/L	0.3	<	<	<	<
Tetrachloroethylene	0.020	mg/L	3	<	<	<	<
Trichloroethylene	0.020	mg/L	5	<	<	<	<
Vinyl Chloride	0.020	mg/L	0.2	<	<	<	<
Total PAH		mg/L	nc	-	-	-	-
Flashpoint		°C	nc	NF/NI	NF/NI	NF/NI	NF/NI

MDL	method detection limit
<	less than MDL
<###	less than adjusted DL (###)
TCLP	Toxicity Characteristic Leaching Procedure
NF/NI	Non-flammable/Non-ignitable
na	not applicable
nc	no criterion
nd	not detected
mg/L	milligrams per litre
µg/g	micrograms per gram
[1]	Ontario Regulation 347, General - Waste
BOLD	Exceeds O.Reg. 347 leachate quality criterion

TABLE 4.10 SOIL ANALYTICAL RESULTS
Waste Characterization - Borehole Samples
8 Wing CFB Trenton - New Hangars 5 and 6

SLE Sample No.	MDL	Units	O.Reg. 347 Criteria[1]	BH12-53 (6-8)	BH12-54 (8-10)	BH12-61 (10-11)	BH12-105 (10-11)
Laboratory Sample No.	na	na	na	*NE6949*	*NE3833*	*OI0948*	*OI0952*
Sampling Date	na	na	na	*18-Apr-12*	*20-Apr-12*	*27-Jul-12*	*27-Jul-12*
TCLP Analysis							
Inorganics:							
Arsenic	0.2	mg/L	2.5	<	<	<	<
Barium	0.2	mg/L	100	0.5	0.3	0.4	1.3
Boron	0.1	mg/L	500	<	0.1	<	0.2
Cadmium	0.05	mg/L	0.5	<	<	<	<
Chromium	0.1	mg/L	5	<	<	<	<
Cyanide, free		mg/L	20				
Fluoride		mg/L	150				
Lead	0.1	mg/L	5	<	<	<	<
Mercury	0.001	mg/L	0.1	<	<		
Nitrate + Nitrite (as N)		mg/L	1000				
Selenium	0.1	mg/L	1	<	<	<	<
Silver	0.01	mg/L	5	<	<	<	<
Uranium	0.01	mg/L	10	<	<	<	<
Organics:							
Benzene	0.020	mg/L	0.5	<	<	<	<
Benzo[a]pyrene	0.04	mg/L	0.001			<	<
Carbon Tetrachloride	0.020	mg/L	0.5	<	<	<	<
Chlorobenzene	0.020	mg/L	8	<	0.303	<	<
Chloroform	0.020	mg/L	10	<	<	<	<
1,2-Dichlorobenzene	0.050	mg/L	20	<	11.1	0.413	<
1,4-Dichlorobenzene	0.050	mg/L	0.5	<	0.432	<	<
1,2-Dichloroethane	0.050	mg/L	0.5	<	<	<	<
1,1-Dichloroethylene	0.020	mg/L	1.4	<	<	<	<
Methyl Ethyl Ketone	1.0	mg/L	200	<	<	<	<
Methylene Chloride	0.20	mg/L	5	<	<	<	<
PCBs (total)	0.003	mg/L	0.3	<	<	<	<
Tetrachloroethylene	0.020	mg/L	3	<	<	<	<
Trichloroethylene	0.020	mg/L	5	<	<	<	<
Vinyl Chloride	0.020	mg/L	0.2	<	<	<	<
Total PAH		mg/L	nc	-	-	nd	nd
Flashpoint		°C	nc	NF/NI	NF/NI	NF/NI	NF/NI

MDL	method detection limit
<	less than MDL
<###	less than adjusted DL (###)
TCLP	Toxicity Characteristic Leaching Procedure
NF/NI	Non-flammable/Non-ignitable
na	not applicable
nc	no criterion
nd	not detected
mg/L	milligrams per litre
µg/g	micrograms per gram
[1]	Ontario Regulation 347, General - Waste
BOLD	Exceeds O.Reg. 347 leachate quality criterion

SNC·LAVALIN Environment

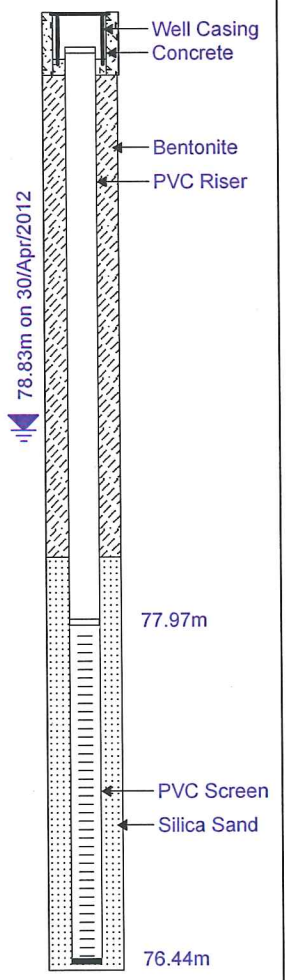
Borehole/Monitoring Well ID: BH/MW12-26

Project No.: 12-308
Client: Defence Construction Canada
Location: CFB Trenton, Trenton, ON
Date Completed: 26 April 2012
Site Datum: Geodetic

SLE Supervisor: Brian S.
Drilling Method: Direct-Push
Borehole Diameter: 83 mm
Monitoring Well Diameter: 32 mm

Drilling Company: Downing`
Drilling Equipment: Geoprobe
Well Casing: 152 mm Alum. Flushmount
Well Screen: Schedule 10 Slot 40 PVC
OVM/PID: RKI Eagle

DEPTH (ft / m)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	PID (3)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
								Ground Surface	80.71
0–1 / 0		BH12-26 (1-2)	◆	40	0	25%		ASPHALT SAND FILL moist, brown	
2–3 / 1		BH12-26 (2-4)	◆	45	0	25%			80.00
4–5		BH12-26 (4-6)		55	0	35%			
6–7 / 2		BH12-26 (6-8)		45	0	30%			79.00
8–9		BH12-26 (8-10)	◆	50	0	-		CLAY moist, brown slight PHC odor	
10–11 / 3		BH12-26 (10-12)		-	-	-		Note: used HSA for well installation and geoprobe for stratigraphy	78.00
12–13 / 4		BH12-26 (12-14)		-	-	-			77.00
14–15								Refusal at 4.3 m bgs using HSA	



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)
(3) Photo Ionization Detector (PID) reading (ppmv)

All elevations and locations are approximate.

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

SNC·LAVALIN Environment

Borehole/Monitoring Well ID: BH/MW12-54

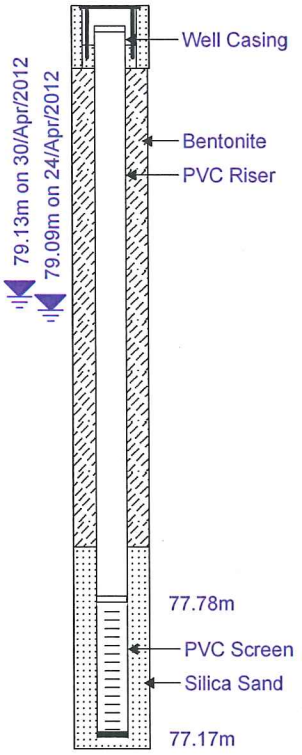
Project No.: 12-308
Client: Defence Construction Canada
Location: CFB Trenton, Trenton, ON
Date Completed: 20 April 2012
Site Datum: Geodetic

SLE Supervisor: Brian S.
Drilling Method: Direct-Push
Borehole Diameter: 250 mm
Monitoring Well Diameter: 32 mm

Drilling Company: Downing
Drilling Equipment: Geoprobe
Well Casing: 152 mm Alum. Flushmount
Well Screen: Schedule 10 Slot 40 PVC
OVM/PID: RKI Eagle

DEPTH (ft / m)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	PID (3)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
								Ground Surface	80.47
0								CONCRETE	
1	-	BH12-54 (0-2)		140	0	100%		SAND AND GRAVEL FILL dry, brown	
2								SILTY SAND FILL dry, brown	80.00
3	-	BH12-54 (2-4)		135	0	100%		moist	
4									
5	-	BH12-54 (4-6)		130	0	100%			79.00
6									
7	-	BH12-54 (6-8)		155	8	100%		CLAY moist, brown	
8									78.00
9	-	BH12-54 (8-10)	◆	300	290	100%		SILTY SAND moist, brown, solvent odors	
10	-	BH12-54 (10-11)		300	270	100%			
11								Refusal at 3.4 m bgs	77.00
12									
13									
14									
15									76.00

Top of Riser Elev.= 80.40 m ald



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)
(3) Photo Ionization Detector (PID) reading (ppmv)

All elevations and locations are approximate.

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

SNC·LAVALIN Environment

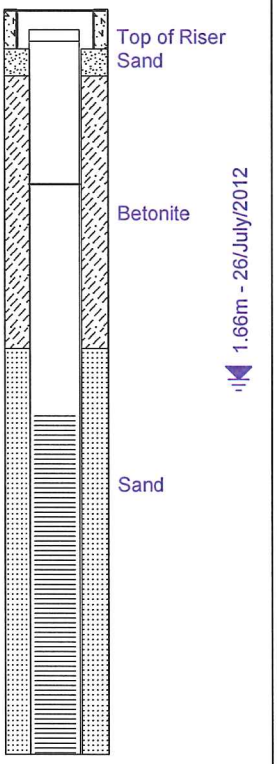
Borehole ID: BH12-94

Project No.: 12-308
Client: Defence Construction Canada
Location: CFB Trenton, Trenton, ON
Date Completed: 25 July 2012
Site Datum: Geodetic

SLE Supervisor: Emily V.
Drilling Method: Direct-Push
Borehole Diameter: 83 mm

Drilling Company: Strata
Drilling Equipment: Geoprobe
OVM: RKI Eagle
PID: RKI Eagle

DEPTH (ft / m)	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	PID (3)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
								Ground Surface	80.54
0								ASPHALT	
1		BH12-94 (0-2)				50%		SAND AND GRAVEL FILL dry, black	
2								dry, brown	80.00
3		BH12-94 (2-4)		15 ppm	9ppm	50%		SILTY CLAY moist, black-brown	
4									
5									79.00
6		BH12-94 (4-6)		55 ppm	9 ppm	85%		SITLY SAND AND GRAVEL moist, brown	
7									
8									78.00
9		BH12-94 (6-8)		85 ppm	501 ppm	85%		CLAY wet, black stain, strong odour	
10								wet, dark grey, strong odour	
11								Refusal at 3.05m bgs	
12									77.00
13									
14									
15									76.00



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)
(3) Photo Ionization Detector (PID) reading (ppmv)

The data represented in this borehole log requires interpretation by SNC-Lavalin Environment personnel. Third parties using this log do so at their own risk.

All elevations and locations are approximate.

◆ Sample submitted for laboratory analysis.

MW12-2			
DATE	Co	To	
2012/05/01	2.5	1.8	
2014/10/28	–	<0.2	

MW12-3				
DATE	Co	U	To	
2012/05/01	1.8	5.4	1.9	
2014/10/28	–	–	<0.2	

MW12-30	
DATE	Co
2012/04/26	1.1
2014/10/29	–

MW12-14	
DATE	T
2012/05/01	1.1
2015/09/24	<0.2
2015/09/24*	<0.2

MW12-4			
DATE	Al	Cr(VI)	V
2012/05/01	88	2.7	13
2014/10/28	–	–	–

MW12-16				
DATE	Co	T	FLAN	PNT
2012/05/01	1.5	2.2	0.078	2.1
2012/07/31	–	<0.2	–	–
2012/08/02	–	–	<0.04	<0.05
2012/08/02*	–	–	<0.04	<0.05
2015/09/23	–	<0.2	–	–

BH31 (H5)	
DATE	c-1,2-DCE
2012/04/26	9.9
2012/08/02	11
2015/09/23	2.7

MW12-20								
DATE	T	B(a)A	B(ghi)P	B(k)F	CH	D(ah)A	FLAN	PNT
2012/05/01	1.1	0.032	0.025	0.018	0.035	0.011	0.13	1.7
2012/05/01*	1.1	0.028	0.023	0.012	0.03	0.01	0.13	1.9
2012/08/02	–	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.04	<0.05

MW14-109	
DATE	PARAMETER
2014/10/27	VOC
2015/09/24	VOC

MW12-5	
DATE	Co
2012/04/30	1.3
2012/07/24	–
2014/10/27	–

MW15-146	
DATE	PARAMETER
2015/10/30	VOC
2015/12/18	VOC

MW15-145	
DATE	PARAMETER
2015/10/30	VOC
2015/10/30*	VOC
2015/12/18	VOC

MW12-48	
DATE	Co
2012/04/26	2.2
2012/07/24	–
2014/10/27	–

MW14-116		
DATE	1,2-DCB	
2014/11/19	1.4	
2015/09/22	2.5	

MW14-115					
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB	T
2014/11/19	18	130	21	46	1.4
2014/11/19*	2.1	24	5.1	11	0.93
2015/09/22	4.9	140	6.4	15	<2
2015/09/22*	4.8	120	5.1	12	<2

MW15-152	
DATE	PARAMETER
2015/10/30	VOC
2015/10/30*	VOC
2015/12/18	VOC

MW15-153	
DATE	PARAMETER
2015/10/29	VOC
2015/12/18	VOC

MW15-144	
DATE	PARAMETER
2015/10/29	VOC

MW15-141	
DATE	PARAMETER
2015/10/30	VOC
2015/12/18	VOC

MW14-106							
DATE	ANTH	B(a)A	B(ghi)P	B(k)F	CH	FLAN	PNT
2014/02/20	0.019	0.023	0.01	<0.01	0.026	0.083	0.084
2014/10/28	<	0.023	0.015	0.012	0.029	0.067	0.031
2015/09/23	<0.01	<0.01	<0.01	<0.01	<0.01	0.022	0.012
2015/09/23*	<0.01	<0.01	<0.01	<0.01	<0.01	0.018	0.01

MW14-131	
DATE	PARAMETER
2014/11/18	VOC
2015/09/24	VOC

MW14-110	
DATE	T
2014/02/20	<0.2
2014/10/28	20

MW14-107				
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB
2014/02/20	240	150	19	49
2014/10/28	250	110	16	38
2014/10/28*	240	110	16	37

MW14-111	
DATE	PARAMETER
2014/02/20	VOC
2014/10/29	VOC

MW14-112	
DATE	PARAMETER
2014/02/20	VOC
2014/10/29	VOC

MW12-104	
DATE	1,2-DCB
2012/08/01	<0.2
2014/09/23	46

MW14-108	
DATE	T
2014/02/20	0.26
2014/10/28	2.3

MW12-94					
DATE	B	CB	1,2-DCB	1,3-DCB	1,4-DCB
2012/07/31	200	6600	26000	1700	3600
2012/07/31*	200	6600	26000	1700	3100
2014/10/27	<200	2600	43000	2400	5300
2014/10/27*	<200	2600	46000	2100	4700

MW12-27					
DATE	B	CB	1,2-DCB	1,3-DCB	1,4-DCB
2012/08/01	210	12000	3300	310	1000

MW12-54					
DATE	CB	CB	1,2-DCB	1,3-DCB	1,4-DCB
2012/04/30	1.1	6700	39000	500	1600
2012/07/23	–	1900	8500	180	480
2014/10/27	–	4400	33000	470	1200

MW12-77								
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB	B(a)A	B(ghi)P	B(k)F	CH	FLAN	PNT
2012/04/25	890	2100	69	170	0.017	0.0098	<0.0085	0.017	0.087	0.59
2012/04/25*	830	2000	65	160	0.023	0.014	0.012	0.021	0.1	0.57
2012/07/30	770	2300	77	150	–	–	–	–	–	–
2012/07/30*	740	2300	75	150	–	–	–	–	–	–
2014/10/29	84	290	8.3	14	–	–	–	–	–	–

MW12-61				
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB
2012/08/01	950	12000	310	620
2012/09/21	490	5300	150	350
2014/10/27	850	6400	160	330

MW12-26					
DATE	Co	CB	1,2-DCB	1,3-DCB	1,4-DCB
2012/04/30	0.93	<0.1	0.3	<0.2	0.29
2012/04/30*	0.91	<0.1	0.28	<0.2	0.27
2012/07/23	–	<0.1	<0.2	<0.2	<0.2
2014/10/27	–	32	54	3.6	9.2
2015/09/23	–	<0.1	<0.2	<0.2	<0.2
2015/09/23*	–	<0.1	<0.2	<0.2	<0.2

MW14-127								
DATE	B	CB	1,2-DCB	1,3-DCB	1,4-DCB	1,2-DCA	T	X
2014/11/19	29	620	1300	360	870	–	0.89	1.3
2014/11/19*	27	620	1400	390	730	–	0.86	1.3
2015/09/23	15000	140000	150000	66000	73000	870	200	210
2015/12/18	430	5600	10000	1500	3000	<100	<100	–
2015/12/18*	410	5500	9700	1400	2900	<100	<100	–

MW14-130	
DATE	PARAMETER
2014/11/19	VOC
2015/09/22	VOC

MW15-158	
DATE	PARAMETER
2015/10/28	VOC
2015/12/18	VOC

MW15-157	
DATE	PARAMETER
2015/10/28	VOC

MW15-156	
DATE	PARAMETER
2015/10/28	VOC
2015/12/18	VOC

MW14-120			
DATE	1,2-DCB	1,3-DCB	1,4-DCB
2014/02/21	0.66	5.7	6.7
2014/11/19	330	41	73
2015/09/22	20	4.6	8.2

MW14-118	
DATE	1,2-DCB
2014/02/20	5
2014/02/20*	5.9
2014/10/29	<0.2
2014/10/29*	<0.2

MW14-121				
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB
2014/02/20	<0.2	<0.2	3.3	9.2
2014/11/19	32	1800	110	200
2015/09/22	5.3	160	12	27

MW14-79 (REDRILLED MW12-79)								
DATE	Mo	U	CB	1,2-DCB	1,3-DCB	1,4-DCB	FLAN	PNT
2012/04/25	92	15	130	20	6.8	21	0.043	0.36
2012/07/30	–	–	<0.1	<0.2	<0.2	<0.2	–	–
2012/09/21	–	–	<0.1	<0.2	<0.2	<0.2	–	–
2014/11/19	–	–	31	2000	110	230	–	–
2015/09/22	–	–	230	9900	500	1200	–	–

MW14-119			
DATE	1,2-DCB	1,3-DCB	1,4-DCB
2014/02/20	<0.2	<0.2	<0.2
2014/11/19	230	28	54

MW15-154	
DATE	PARAMETER
2015/10/29	VOC
2015/10/29	VOC

MW15-143	
DATE	PARAMETER
2015/10/28	VOC
2015/12/18	VOC

MW14-114	
DATE	PARAMETER
2015/11/19	VOC
2015/09/22	VOC

MW15-151				
DATE	CB	1,2-DCB	1,3-DCB	1,4-DCB
2015/10/29	18	170	6.7	19
2015/12/18	22	190	6.7	19
2015/12/18*	20	190	6.2	18

MW15-159	
DATE	PARAMETER
2015/10/28	VOC
2015/12/18	VOC

MW14-113	
DATE	1,2-DCB
2014/02/20	<0.2
2014/10/29	18
2015/09/22	31

PARAMETERS	ABBREVIATION	RDL	GUIDELINES PWQO
ALUMINUM	Al	1	75
COBALT	Co	0.3	0.9
CHROMIUM VI	Cr(VI)	0.5	1
MOLYBDENUM	Mo	0.2	40
URANIUM	U	0.1	5
VANADIUM	V	1	6
BENZENE	B	0.1	100
CHLOROBENZENE	CB	0.1	15
DICHLOROBENZENE, 1,2-	1,2-DCB	0.2	2.5
DICHLOROBENZENE, 1,3-	1,3-DCB	0.2	2.5
DICHLOROBENZENE, 1,4-	1,4-DCB	0.2	4
DICHLOROETHANE, 1,2-	1,2-DCA	0.2	100
TOLUENE	T	0.2	0.8
ANTHRACENE	ANTH	0.010	0.0008
BENZO(A)ANTHRACENE	B(a)A	0.010	0.0004
BENZO(G,H,I)PERYLENE	B(ghi)P	0.010	0.00002
BENZO(K)FLUORANTHENE	B(k)F	0.010	0.0002
CHRYSENE	CH	0.010	0.0001
FLUORANTHENE	FLAN	0.010	0.0008
PHENANTHRENE	PNT	0.010	0.03

STANDARDS:
- PROVINCIAL WATER QUALITY OBJECTIVES (PWQO, 1994), WHERE PWQO IS HARDNESS DEPENDENT, HARDNESS OF RECEIVING WATER ASSUMED TO BE >100 MG/L.T
- "GREEN" : GREEN COLOURED CONCENTRATION SATISFIES PWQO AT THE TIME OF SAMPLING
- "RED" : RED COLOURED & UNDERLINED CONCENTRATION EXCEEDS THE PWQO APPLICABLE AT THE TIME OF SAMPLING
- "BLACK" : NO GUIDELINE IS AVAILABLE FOR PARAMETER REPORTED IN BLACK

GENERAL NOTES:
1. ALL CONCENTRATIONS IN MICROGRAMS/LITRE (UG/L)
2. "NG" : NO GUIDELINE
3. "<" : LESS THAN ROUTINE REPORTABLE DETECTION LIMIT APPLICABLE AT THE TIME OF REPORTING
4. "-" : NOT ANALYSED
5. "*" : FIELD DUPLICATE OF PREVIOUSLY LISTED SAMPLE
6. "M" : METRES
7. "YYYY/MM/DD" : DATE FORMAT YYYY/MM/DD
8. "VOC" : VOLATILE ORGANIC COMPOUNDS

NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PRINTED, PHOTOCOPIED OR FAXED IN OTHER THAN ITS ORIGINAL SIZE AND COLOURS

SOURCE(S):
1. NATIONAL DEFENCE, NEW MAINTENANCE HANGAR DEVELOPMENT, HANGAR 6, GEOTECHNICAL INVESTIGATION PLAN, DWG. #C-TB1-3019-1003, DECEMBER 4, 2009
2. NATIONAL DEFENCE, NEW MAINTENANCE HANGAR DEVELOPMENT, HANGAR 6, DEMOLITION PLAN, DWG. #C-TB1-3019-6002, DECEMBER 4, 2009
3. NATIONAL DEFENCE, NEW MAINTENANCE HANGAR DEVELOPMENT, HANGAR 5, GEOTECHNICAL INVESTIGATION PLAN, DWG. #C-TB1-3018-1003, FEBRUARY 25, 2011
4. NATIONAL DEFENCE, NEW MAINTENANCE HANGAR DEVELOPMENT, HANGAR 5, DEMOLITION & REMOVALS PLAN, DWG. #C-TB1-3018-6002, FEBRUARY 25, 2011

LEGEND
- OUTLINE OF FUTURE HANGAR
- EXISTING FENCE
- FORMER SITE INFRASTRUCTURE
- LOCATION (MONITORING WELL) WHERE NO SAMPLES WERE TAKEN IN THE MOST RECENT SAMPLING EVENT SHOWN IN BLACK
- ANALYSED GROUNDWATER SAMPLE LOCATION – ALL ANALYSED PARAMETERS SATISFY THE SELECTED STANDARDS IN THE MOST RECENT SAMPLING EVENT SHOWN IN GREEN
- ANALYSED GROUNDWATER SAMPLE LOCATION – AT LEAST ONE ANALYSED PARAMETER EXCEEDS THE SELECTED STANDARD IN THE MOST RECENT SAMPLING EVENT SHOWN IN RED
- (A) ABANDONED MONITORING WELL

SCALE 1:750
0 10 20 40m

INSET SCALE 1:200

SNC·LAVALIN

Client/Location: DCC
NEW HANGAR 5 & 6 – 8 WING CFB TRENTON
TRENTON, ONTARIO

Project No: 643622
Drawn: EM
Filename: 643622-POPG-GV-2.DWG
Verified: EK
Date: MARCH 2017
Project Manager: EK

Title: SUMMARY OF GROUNDWATER CONTAMINANTS OF CONCERN IN OVERBURDEN MONITORING WELLS

Dwg No: FIGURE X

PAGE FORMAT: 22x34

TABLE C.1 :
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	**MW12-2** DH9505 MW12-2-05012012 2012/05/01	MW12-3 DH9509 MW12-3-05012012 2012/05/01	**MW12-4** DH9506 MW12-4-05012012 2012/05/01	MW12-5 DH9502 MW12-5-04302012 2012/04/30
Parameter	**RDL**	**Units**					
Dissolved Metals							
Aluminum	1	µg/L	75	6.4	6.6	***88***	3
Antimony	0.6	µg/L	20	< 0.6	< 0.6	< 0.6	< 0.6
Arsenic	0.2	µg/L	5 (100)[4]	0.52	0.64	1.1	0.28
Barium	10	µg/L	na	31	20	< 10	38
Beryllium	1	µg/L	11 (no hardness)	< 1	< 1	< 1	< 1
Boron	20	µg/L	200	71	150	< 20	55
Cadmium	0.005	µg/L	0.2 (no hardness)[4]	0.026	0.067	< 0.005	0.011
Calcium	300	µg/L	na	89,000	210,000	34,000	190,000
Chromium (total)	1	µg/L	9.9	< 1	< 1	2.6	< 1
Chromium (VI)	0.5	µg/L	1	-	-	-	-
Cobalt	0.3	µg/L	0.9	***2.5***	***1.6***	0.66	***1.3***
Copper	0.2	µg/L	5 (no hardness)[4]	0.72	1.4	3.3	0.35
Iron	60	µg/L	300	160	91	< 60	75
Lead	0.2	µg/L	1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2	< 0.2
Lithium	20	µg/L	na	< 20	< 20	< 20	< 20
Magnesium	200	µg/L	na	9,000	45,000	4,400	41,000
Manganese	4	µg/L	na	81	86	< 4	120
Mercury	0.01	µg/L	0.2	-	-	-	-
Molybdenum	0.2	µg/L	40	30	16	14	3.2
Nickel	0.5	µg/L	25	5.1	4.3	1.2	2.6
Phosphorous	100	µg/L	30	< 100[1]	< 100[1]	< 100[1]	< 100[1]
Selenium	0.2	µg/L	100	1.2	0.34	1.3	< 0.2
Silicon	100	µg/L	na	6,000	8,500	7,300	8,900
Silver	0.1	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sodium	500	µg/L	na	51,000	48,000	44,000	37,000
Strontium	20	µg/L	na	500	1,200	410	690
Sulphur	200	µg/L	na	46,000	110,000	33,000	69,000
Thallium	0.2	µg/L	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Tin	1	µg/L	na	< 1	< 1	< 1	< 1
Titanium	1	µg/L	na	< 1	< 1	< 1	< 1
Uranium	0.1	µg/L	5	2.4	***5.4***	0.12	3
Vanadium	1	µg/L	6	< 1	< 1	***13***	< 1
Zinc	3	µg/L	20 (30)[4]	< 3	7	< 3	< 3

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ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

			PWQO[2]	MW12-16	MW12-20	MW12-20	MW12-26
		SNC-Lavalin Sample ID		DH9507	DH9508	DH9508_	DH9503/NH6477
		Laboratory Sample ID		MW12-16-05012012	MW12-20-05012012	MW12-20-200-05012012	MW12-26-04302012
		Sample Location					
		Sampling Date (yyyy/mm/dd)		2012/05/01	2012/05/01	2012/05/01	2012/04/30
						Duplicate of MW12-20	
Parameter	**RDL**	**Units**					
Dissolved Metals							
Aluminum	1	µg/L	75	10	6.8	6.86.8	2.8
Antimony	0.6	µg/L	20	< 0.6	< 0.6	< 0.6< 0.6	< 0.6
Arsenic	0.2	µg/L	5 (100)[4]	1.5	1.3	1.31.3	0.27
Barium	10	µg/L	na	24	39	3939	51
Beryllium	1	µg/L	11 (no hardness)	< 1	< 1	< 1< 1	< 1
Boron	20	µg/L	200	160	38	3636	47
Cadmium	0.005	µg/L	0.2 (no hardness)[4]	0.069	0.023	0.020.02	0.0096
Calcium	300	µg/L	na	110,000	140,000	140,000140,000	140,000
Chromium (total)	1	µg/L	9.9	< 1	< 1	< 1< 1	< 1
Chromium (VI)	0.5	µg/L	1	-	-	< 0.5< 0.5	< 0.5
Cobalt	0.3	µg/L	0.9	***1.5***	***1.2***	***1.3***	***0.93***
Copper	0.2	µg/L	5 (no hardness)[4]	1.4	0.52	0.410.41	0.39
Iron	60	µg/L	300	< 60	160	170170	< 60
Lead	0.2	µg/L	1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2< 0.2	< 0.2
Lithium	20	µg/L	na	< 20	< 20	< 20< 20	< 20
Magnesium	200	µg/L	na	16,000	15,000	15,00015,000	17,000
Manganese	4	µg/L	na	120	290	300300	620
Mercury	0.01	µg/L	0.2	-	-	< 0.01< 0.01	< 0.01
Molybdenum	0.2	µg/L	40	15	13	1313	5
Nickel	0.5	µg/L	25	2.5	3.1	33	2.3
Phosphorous	100	µg/L	30	< 100[1]	< 100[1]	< 100! < 100[1]	< 100[1]
Selenium	0.2	µg/L	100	1.6	0.36	0.370.37	0.42
Silicon	100	µg/L	na	6,600	10,000	10,00010,000	7,300
Silver	0.1	µg/L	0.1	< 0.1	< 0.1	< 0.1< 0.1	< 0.1
Sodium	500	µg/L	na	11,000	27,000	27,00027,000	21,000
Strontium	20	µg/L	na	440	330	330330	450
Sulphur	200	µg/L	na	21,000	27,000	27,00027,000	26,000
Thallium	0.2	µg/L	0.3	< 0.2	< 0.2	< 0.2< 0.2	< 0.2
Tin	1	µg/L	na	< 1	< 1	< 1< 1	< 1
Titanium	1	µg/L	na	1.2	< 1	< 1< 1	< 1
Uranium	0.1	µg/L	5	3.2	3.2	3.33.3	1.7
Vanadium	1	µg/L	6	< 1	< 1	< 1< 1	< 1
Zinc	3	µg/L	20 (30)[4]	< 3	< 3	< 3< 3	< 3

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Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

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Parameter	**RDL**	**Units**						
Dissolved Metals								
Aluminum	1	µg/L		75	2.6	3.4	5.2	4.1
Antimony	0.6	µg/L		20	< 0.6	< 0.6	< 0.6	< 0.6
Arsenic	0.2	µg/L		5 (100)[4]	0.23	0.38	0.45	0.44
Barium	10	µg/L		na	51	77	43	42
Beryllium	1	µg/L		11 (no hardness)	< 1	< 1	< 1	< 1
Boron	20	µg/L		200	46	150	90	77
Cadmium	0.005	µg/L		0.2 (no hardness)[4]	0.0087	0.011	0.0089	0.018
Calcium	300	µg/L		na	140,000	160,000	130,000	170,000
Chromium (total)	1	µg/L		9.9	< 1	< 1	< 1	< 1
Chromium (VI)	0.5	µg/L		1	< 0.5	-	-	-
Cobalt	0.3	µg/L		0.9	***0.91***	***1.1***	***1.2***	***2.2***
Copper	0.2	µg/L		5 (no hardness)[4]	0.41	0.31	0.66	1.3
Iron	60	µg/L		300	< 60	< 60	< 60	< 60
Lead	0.2	µg/L		1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2	< 0.2
Lithium	20	µg/L		na	< 20	44	< 20	21
Magnesium	200	µg/L		na	18,000	52,000	42,000	45,000
Manganese	4	µg/L		na	610	210	39	100
Mercury	0.01	µg/L		0.2	< 0.01	-	-	-
Molybdenum	0.2	µg/L		40	5	3.7	11	10
Nickel	0.5	µg/L		25	2.4	1.9	1.9	4.8
Phosphorous	100	µg/L		30	< 100[1]	< 100[1]	< 100[1]	< 100[1]
Selenium	0.2	µg/L		100	0.39	< 0.2	0.27	0.28
Silicon	100	µg/L		na	7,300	7,500	7,800	8,300
Silver	0.1	µg/L		0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sodium	500	µg/L		na	21,000	77,000	44,000	42,000
Strontium	20	µg/L		na	450	1,300	1,000	1,100
Sulphur	200	µg/L		na	26,000	55,000	76,000	41,000
Thallium	0.2	µg/L		0.3	< 0.2	< 0.2	< 0.2	< 0.2
Tin	1	µg/L		na	< 1	< 1	< 1	< 1
Titanium	1	µg/L		na	< 1	< 1	< 1	< 1
Uranium	0.1	µg/L		5	1.6	1.6	4.1	4.2
Vanadium	1	µg/L		6	< 1	< 1	< 1	< 1
Zinc	3	µg/L		20 (30)[4]	< 3	< 3	< 3	< 3

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

			PWQO[2]	MW12-51 DH5268 MW12-51-04262012 2012/04/26	MW12-52 DH5269 MW12-52-04262012 2012/04/26	MW12-52 ED3299 MW12-52-08012012 2012/08/01	MW12-52 ED3299_ MW12-52-200-08012012 2012/08/01 Duplicate of MW12-52
SNC-Lavalin Sample ID							
Laboratory Sample ID							
Sample Location							
Sampling Date (yyyy/mm/dd)							
Parameter	**RDL**	**Units**					
Dissolved Metals							
Aluminum	1	µg/L	75	3.3	***300***	3.6	3.93.9
Antimony	0.6	µg/L	20	< 0.6	< 0.6	< 0.6	< 0.6< 0.6
Arsenic	0.2	µg/L	5 (100)[4]	0.27	0.47	4	3.83.8
Barium	10	µg/L	na	41	49	43	4242
Beryllium	1	µg/L	11 (no hardness)	< 1	< 1	< 1	< 1< 1
Boron	20	µg/L	200	26	49	76	7171
Cadmium	0.005	µg/L	0.2 (no hardness)[4]	0.013	0.016	0.0073	0.00880.0088
Calcium	300	µg/L	na	150,000	160,000	150,000	150,000150,000
Chromium (total)	1	µg/L	9.9	< 1	< 1	< 1	< 1< 1
Chromium (VI)	0.5	µg/L	1	-	-	-	< 0.5< 0.5
Cobalt	0.3	µg/L	0.9	***0.94***	***2.7***	***3***	***2.8***
Copper	0.2	µg/L	5 (no hardness)[4]	0.48	1	< 0.2	0.30.3
Iron	60	µg/L	300	< 60	280	***700***	***790***
Lead	0.2	µg/L	1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2	< 0.2< 0.2
Lithium	20	µg/L	na	< 20	27	25	2828
Magnesium	200	µg/L	na	19,000	55,000	50,000	51,00051,000
Manganese	4	µg/L	na	160	140	150	150150
Mercury	0.01	µg/L	0.2	-	-	-	< 0.01< 0.01
Molybdenum	0.2	µg/L	40	3.1	5.9	8.7	8.18.1
Nickel	0.5	µg/L	25	2.3	4.2	2.7	2.72.7
Phosphorous	100	µg/L	30	< 100[1]	< 100[1]	< 100[1]	< 100! < 100[1]
Selenium	0.2	µg/L	100	< 0.2	0.2	< 0.2	< 0.2< 0.2
Silicon	100	µg/L	na	7,300	10,000	11,000	11,00011,000
Silver	0.1	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1< 0.1
Sodium	500	µg/L	na	21,000	35,000	39,000	38,00038,000
Strontium	20	µg/L	na	360	900	870	870870
Sulphur	200	µg/L	na	40,000	33,000	36,000	36,00036,000
Thallium	0.2	µg/L	0.3	< 0.2	< 0.2	< 0.2	< 0.2< 0.2
Tin	1	µg/L	na	< 1	< 1	< 1	< 1< 1
Titanium	1	µg/L	na	< 1	16	< 1	< 1< 1
Uranium	0.1	µg/L	5	2.4	4.9	***5.3***	***5.3***
Vanadium	1	µg/L	6	< 1	< 1	< 1	< 1< 1
Zinc	3	µg/L	20 (30)[4]	< 3	3.1	< 3	< 3< 3

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Laboratory analysis by
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na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.1 :
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

			PWQO[2]	**MW12-54**	**MW12-65**	**MW12-77**	**MW12-77**
				DH9485	DH5260	NG1938/DH5258	NG1939/DH5259
				MW12-54-04302012	MW12-65-04252012	MW12-77-04252012	MW12-77-200-04252012
				2012/04/30	2012/04/25	2012/04/25	2012/04/25
							Duplicate of
Parameter	**RDL**	**Units**					MW12-77
Dissolved Metals							
Aluminum	1	µg/L	75	7.3	3.1	2.4	2.4
Antimony	0.6	µg/L	20	< 0.6	< 0.6	< 0.6	< 0.6
Arsenic	0.2	µg/L	5 (100)[4]	0.67	0.22	0.3	0.29
Barium	10	µg/L	na	88	56	98	98
Beryllium	1	µg/L	11 (no hardness)	< 1	< 1	< 1	< 1
Boron	20	µg/L	200	100	< 20	43	41
Cadmium	0.005	µg/L	0.2 (no hardness)[4]	0.025	0.0071	0.0055	0.011
Calcium	300	µg/L	na	120,000	65,000	130,000	130,000
Chromium (total)	1	µg/L	9.9	< 1	< 1	< 1	< 1
Chromium (VI)	0.5	µg/L	1	-	-	< 0.5	< 0.5
Cobalt	0.3	µg/L	0.9	***1.1***	0.42	0.62	0.62
Copper	0.2	µg/L	5 (no hardness)[4]	0.87	< 0.2	0.24	0.28
Iron	60	µg/L	300	< 60	< 60	< 60	< 60
Lead	0.2	µg/L	1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2	< 0.2
Lithium	20	µg/L	na	< 20	< 20	< 20	< 20
Magnesium	200	µg/L	na	30,000	23,000	24,000	24,000
Manganese	4	µg/L	na	170	30	96	97
Mercury	0.01	µg/L	0.2	-	-	< 0.01	< 0.01
Molybdenum	0.2	µg/L	40	14	3.9	3.1	3.1
Nickel	0.5	µg/L	25	6	0.95	1.7	1.9
Phosphorous	100	µg/L	30	< 100[1]	< 100[1]	< 100[1]	< 100[1]
Selenium	0.2	µg/L	100	0.4	< 0.2	< 0.2	0.2
Silicon	100	µg/L	na	9,800	7,000	7,900	7,900
Silver	0.1	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sodium	500	µg/L	na	29,000	19,000	25,000	25,000
Strontium	20	µg/L	na	670	310	600	600
Sulphur	200	µg/L	na	14,000	16,000	28,000	27,000
Thallium	0.2	µg/L	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Tin	1	µg/L	na	1.7	< 1	< 1	< 1
Titanium	1	µg/L	na	< 1	< 1	< 1	< 1
Uranium	0.1	µg/L	5	2.6	4.3	2.4	2.5
Vanadium	1	µg/L	6	< 1	< 1	< 1	< 1
Zinc	3	µg/L	20 (30)[4]	< 3	3.3	4.4	< 3

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			SNC-Lavalin Sample ID	**PWQO[2]**	**MW12-79**	**MW12-82**	**MW12-84**	**MW12-86**
			Laboratory Sample ID		DH5257	DH5256	DH5255	DH5254
			Sample Location		MW12-79-04252012	MW12-82-04242012	MW12-84-04232012	MW12-86-04232012
			Sampling Date (yyyy/mm/dd)		2012/04/25	2012/04/24	2012/04/23	2012/04/23
Parameter	**RDL**	**Units**						
Dissolved Metals								
Aluminum	1	µg/L		75	3.8	3.7	2.4	3.3
Antimony	0.6	µg/L		20	< 0.6	< 0.6	< 0.6	< 0.6
Arsenic	0.2	µg/L		5 (100)[4]	0.48	< 0.2	< 0.2	0.35
Barium	10	µg/L		na	76	50	71	67
Beryllium	1	µg/L		11 (no hardness)	< 1	< 1	< 1	< 1
Boron	20	µg/L		200	140	< 20	24	34
Cadmium	0.005	µg/L		0.2 (no hardness)[4]	0.016	0.012	< 0.005	0.012
Calcium	300	µg/L		na	60,000	68,000	110,000	110,000
Chromium (total)	1	µg/L		9.9	< 1	< 1	< 1	< 1
Chromium (VI)	0.5	µg/L		1	-	-	-	-
Cobalt	0.3	µg/L		0.9	< 0.3	< 0.3	0.51	0.59
Copper	0.2	µg/L		5 (no hardness)[4]	0.25	0.26	0.37	0.54
Iron	60	µg/L		300	< 60	< 60	< 60	< 60
Lead	0.2	µg/L		1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2	< 0.2
Lithium	20	µg/L		na	43	< 20	< 20	< 20
Magnesium	200	µg/L		na	18,000	15,000	18,000	12,000
Manganese	4	µg/L		na	15	14	39	40
Mercury	0.01	µg/L		0.2	-	-	-	-
Molybdenum	0.2	µg/L		40	***42***	1.9	1.5	3
Nickel	0.5	µg/L		25	0.88	< 0.5	1.1	1.4
Phosphorous	100	µg/L		30	< 100[1]	< 100[1]	< 100[1]	< 100[1]
Selenium	0.2	µg/L		100	< 0.2	0.74	0.5	< 0.2
Silicon	100	µg/L		na	6,000	6,900	7,100	7,500
Silver	0.1	µg/L		0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sodium	500	µg/L		na	57,000	20,000	38,000	17,000
Strontium	20	µg/L		na	600	220	340	290
Sulphur	200	µg/L		na	7,300	6,300	8,800	11,000
Thallium	0.2	µg/L		0.3	< 0.2	< 0.2	< 0.2	< 0.2
Tin	1	µg/L		na	< 1	< 1	< 1	< 1
Titanium	1	µg/L		na	< 1	< 1	< 1	< 1
Uranium	0.1	µg/L		5	***15***	1	1.7	1
Vanadium	1	µg/L		6	< 1	< 1	< 1	< 1
Zinc	3	µg/L		20 (30)[4]	5.4	< 3	< 3	< 3

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	SNC-Lavalin Sample ID		**PWQO[2]**	**MW12-86**	**MW12-89**	**MW12-90**
	Laboratory Sample ID			ED3301	DH5242	DH5241
	Sample Location			MW12-86-07312012	MW12-89-04232012	MW12-90-04232012
	Sampling Date (yyyy/mm/dd)			2012/07/31	2012/04/23	2012/04/23
Parameter	**RDL**	**Units**				
Dissolved Metals						
Aluminum	1	µg/L	75	2.2	3.5	3.7
Antimony	0.6	µg/L	20	< 0.6	< 0.6	< 0.6
Arsenic	0.2	µg/L	5 (100)[4]	0.25	0.21	1
Barium	10	µg/L	na	76	88	89
Beryllium	1	µg/L	11 (no hardness)	< 1	< 1	< 1
Boron	20	µg/L	200	34	45	34
Cadmium	0.005	µg/L	0.2 (no hardness)[4]	< 0.005	0.009	0.013
Calcium	300	µg/L	na	100,000	89,000	70,000
Chromium (total)	1	µg/L	9.9	< 1	< 1	< 1
Chromium (VI)	0.5	µg/L	1	-	-	-
Cobalt	0.3	µg/L	0.9	0.38	0.39	0.68
Copper	0.2	µg/L	5 (no hardness)[4]	0.55	0.62	0.54
Iron	60	µg/L	300	< 60	< 60	< 60
Lead	0.2	µg/L	1 (hardness is Null)[4]	< 0.2	< 0.2	< 0.2
Lithium	20	µg/L	na	< 20	< 20	< 20
Magnesium	200	µg/L	na	10,000	16,000	15,000
Manganese	4	µg/L	na	21	17	140
Mercury	0.01	µg/L	0.2	-	-	-
Molybdenum	0.2	µg/L	40	0.98	1.5	2
Nickel	0.5	µg/L	25	1.1	1.2	1.5
Phosphorous	100	µg/L	30	< 100[1]	< 100[1]	< 100[1]
Selenium	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Silicon	100	µg/L	na	7,200	6,100	7,200
Silver	0.1	µg/L	0.1	< 0.1	< 0.1	< 0.1
Sodium	500	µg/L	na	15,000	26,000	24,000
Strontium	20	µg/L	na	240	320	310
Sulphur	200	µg/L	na	9,500	17,000	10,000
Thallium	0.2	µg/L	0.3	< 0.2	< 0.2	< 0.2
Tin	1	µg/L	na	< 1	< 1	< 1
Titanium	1	µg/L	na	< 1	< 1	< 1
Uranium	0.1	µg/L	5	0.51	1.6	1.2
Vanadium	1	µg/L	6	< 1	< 1	< 1
Zinc	3	µg/L	20 (30)[4]	< 3	< 3	< 3

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-2 NH6522 MW12-2-05012012 2012/05/01	MW12-2 YF6620 MW12-2-10282014 2014/10/28	MW12-3 NH6526 MW12-3-05012012 2012/05/01	MW12-3 YF6621 MW12-3-10282014 2014/10/28
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	30	< 10	27	< 10
Benzene	0.1	µg/L	100	0.75	0.15	0.75	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	0.16	0.26
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	0.32	0.15	0.45	0.65
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	-	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	0.79	0.2	0.73	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	1.8	< 0.5	0.81	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 0.1	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***1.8***	< 0.2	***1.9***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	0.2	0.19	0.16	0.22
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	2.2	0.25	2.1	< 0.1
Xylenes, o-	0.1	µg/L	40	0.55	< 0.1	0.54	< 0.1
Xylenes	0.1	µg/L	72	2.7	0.25	2.7	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-4 NH6523 MW12-4-05012012 2012/05/01	MW12-4 YF6646 MW12-4-10282014 2014/10/28	MW12-5 NH6476 MW12-5-04302012 2012/04/30	MW12-5 OI2844 MW12-5-07242012 2012/07/24
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	43	20	< 10	< 10
Benzene	0.1	µg/L	100	0.27	< 0.1	0.1	0.11
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	1	0.78
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	2.7	2.5
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	0.21	0.18
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	-	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	0.55	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 0.1	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	0.58	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	0.99	< 0.1	4.6	4.8
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.73	0.18	0.14	0.12
Xylenes, o-	0.1	µg/L	40	0.35	0.41	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	1.1	0.59	0.14	0.12
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-5 YF6670 MW12-5-10272014 2014/10/27	MW12-14 BAW114 MW12-14-09242015 2015/09/24	MW12-14 BAW115 MW12-114-09242015 2015/09/24 Duplicate of MW12-14	MW12-14 NH6460 MW12-14-05012012 2012/05/01
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	-	-	40
Benzene	0.1	µg/L	100	< 0.1	< 0.2	< 0.2	0.6
Bromodichloromethane	0.1	µg/L	200	< 0.1	-	-	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	-	-	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	-	-	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	-	-	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	-	-	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	-	-	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	-	-	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	-	-	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	-	-	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	-	-	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	-	-	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.8	-	-	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	-	-	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	-	-	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	2.7	-	-	0.23
Dichloroethylene, trans-1,2-	0.1	µg/L	na	0.2	-	-	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	-	-	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	-	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	-	-	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	-	-	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.2	< 0.2	0.63
Ethylene Dibromide	0.2	µg/L	na	< 0.2	-	-	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	-	-	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	-	-	5.8
Methyl Isobutyl Ketone	5	µg/L	600	< 5	-	-	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	-	-	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	-	-	0.53
Styrene	0.2	µg/L	4	< 0.2	-	-	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	-	-	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	-	-	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	-	-	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 0.2	***1.1***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	-	-	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	-	-	< 0.2
Trichloroethylene	0.1	µg/L	20	5.3	-	-	0.25
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	-	-	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	-	-	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.4	< 0.4	0.85
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.2	< 0.2	0.24
Xylenes	0.1	µg/L	72	< 0.1	< 0.4	< 0.4	1.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	-	-	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	-	-	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	-	-	< 0.2

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-16	MW12-16	MW12-16	MW12-20
	Laboratory Sample ID			BAW116	NH6524	OJ7927	NH6525
	Sample Location			MW12-16-09232015	MW12-16-05012012	MW12-16-07312012	MW12-20-05012012
	Sampling Date (yyyy/mm/dd)			2015/09/23	2012/05/01	2012/07/31	2012/05/01
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	31	< 10	41
Benzene	0.1	µg/L	100	< 0.1	1.1	< 0.1	0.14
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	0.17
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	-	< 0.28	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.69	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.2	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	***2.2***	< 0.2	***1.1***
Trichloroethane, 1,1,1-	0.1	µg/L	10	0.15	0.22	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	0.42	2.6	0.28	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	1.8	< 0.1	0.21
Xylenes, o-	0.1	µg/L	40	< 0.1	0.48	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	2.2	< 0.1	0.21
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-20 DH9508_ MW12-20-200-05012012 2012/05/01 Duplicate of MW12-20	MW12-26 BAW135 MW12-26-09232015 2015/09/23	MW12-26 BAW136 MW12-126-09232015 2015/09/23 Duplicate of MW12-26	MW12-26 DH9503/NH6477 MW12-26-04302012 2012/04/30
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	3939	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.130.13	< 0.1	< 0.1	0.24
Bromodichloromethane	0.1	µg/L	200	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2< 0.2	< 0.2	< 0.2	0.3
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2< 0.2	< 0.2	< 0.2	0.29
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.20.2	< 0.1	0.21	0.12
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	< 0.28	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***1.1***	< 0.2	< 0.2	0.46
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1< 0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.250.25	< 0.1	0.16	0.42
Xylenes, o-	0.1	µg/L	40	< 0.1< 0.1	< 0.1	< 0.1	0.11
Xylenes	0.1	µg/L	72	0.250.25	< 0.1	< 0.1	0.53
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2	< 0.2

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-26	MW12-26	MW12-26	MW12-27
	Laboratory Sample ID			DH9504/NH6478	OI2843	YF6668	OJ7934
	Sample Location			MW12-26-200-04302012	MW12-26-07232012	MW12-26-10272014	MW12-27-08012012
	Sampling Date (yyyy/mm/dd)			2012/04/30	2012/07/23	2014/10/27	2012/08/01
				Duplicate of MW12-26			
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 100	< 10,000
Benzene	0.1	µg/L	100	0.24	0.16	1.1	***210***
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 1	< 100
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 2	< 200[1]
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 5[1]	< 500[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 100
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	***92***	***12,000***
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 100
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.28	< 0.2	***54***	***3,300***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	***3.6***	***510***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	0.27	< 0.2	***9.2***	***1,000***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 5	< 500
Dichloroethane, 1,1-	0.1	µg/L	200	0.15	0.13	< 1	< 100
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 2	< 200[1]
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 1	< 100[1]
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 100
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 100
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 100
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	< 2.8	< 280[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 1	< 100[1]
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 5	< 500
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 50	< 5,000[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 50	< 5,000[1]
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 2	< 200
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 5	< 500
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 2	< 200[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 2	< 200[1]
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 2	< 200[1]
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 1	< 100[1]
Toluene	0.2	µg/L	0.8	0.48	0.27	< 2[1]	< 200[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 1	< 100[1]
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 2	< 200
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 1	< 100[1]
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 2	< 200
Xylenes, m+p-	0.1	µg/L	32	0.39	0.24	< 1	< 100[1]
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	< 1	< 100[1]
Xylenes	0.1	µg/L	72	0.39	0.24	< 1	< 100[1]
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 200

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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-30	MW12-30	MW12-34	MW12-48
	Laboratory Sample ID			NG1945	YF6667	NG1944	NG1941
	Sample Location			MW12-30-04262012	MW12-30-10292014	MW12-34-04262012	MW12-48-04262012
	Sampling Date (yyyy/mm/dd)			2012/04/26	2014/10/29	2012/04/26	2012/04/26
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	14	< 10
Benzene	0.1	µg/L	100	0.21	< 0.1	0.69	0.26
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	0.59	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	0.48	< 0.2	***1.2***	0.53
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.42	< 0.1	0.98	0.42
Xylenes, o-	0.1	µg/L	40	0.12	< 0.1	0.34	0.12
Xylenes	0.1	µg/L	72	0.54	< 0.1	1.3	0.54
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-48	MW12-48	MW12-51	MW12-52
	Laboratory Sample ID			OI2842	YF6674	NG1942	NG1943
	Sample Location			MW12-48-07242012	MW12-48-10272014	MW12-51-04262012	MW12-52-04262012
	Sampling Date (yyyy/mm/dd)			2012/07/24	2014/10/27	2012/04/26	2012/04/26
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.28	< 0.1	0.16	0.18
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	0.31	0.43
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.16	< 0.1	0.34	0.42
Xylenes, o-	0.1	µg/L	40	0.11	< 0.1	< 0.1	0.1
Xylenes	0.1	µg/L	72	0.27	< 0.1	0.34	0.52
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-54	MW12-54	MW12-54	MW12-54B
	Laboratory Sample ID			NH6458	OI2845	YF6697	ON0423
	Sample Location			MW12-54-04302012	MW12-54-07232012	MW12-54-10272014	MW12-54B-08152012
	Sampling Date (yyyy/mm/dd)			2012/04/30	2012/07/23	2014/10/27	2012/08/15
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 1,000	< 5,000	< 20,000	< 1,000
Benzene	0.1	µg/L	100	68	< 50	< 200[1]	97
Bromodichloromethane	0.1	µg/L	200	< 10	< 50	< 200	< 10
Bromoform	0.2	µg/L	60	< 20	< 100[1]	< 400[1]	< 20
Bromomethane	0.5	µg/L	0.9	< 50[1]	< 250[1]	< 1,000[1]	< 50[1]
Carbon Tetrachloride	0.1	µg/L	na	< 10	< 50	< 200	< 10
Chlorobenzene	0.1	µg/L	15	***6,700***	***1,900***	***4,400***	< 10
Chloroform	0.1	µg/L	na	< 10	< 50	< 200	30
Dibromochloromethane	0.2	µg/L	na	< 20	< 100	< 400	< 20
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***39,000***	***9,500***	***33,000***	< 20[1]
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***500***	***180***	***470***	< 20[1]
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***1,600***	***480***	***1,200***	< 20[1]
Dichlorodifluoromethane	0.5	µg/L	na	< 50	< 250	< 1,000	< 50
Dichloroethane, 1,1-	0.1	µg/L	200	< 10	< 50	< 200	< 10
Dichloroethane, 1,2-	0.2	µg/L	100	< 20	< 100	< 400[1]	< 20
Dichloroethylene, 1,1-	0.1	µg/L	40	< 10	< 50[1]	< 200[1]	< 10
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 10	< 50	< 200	< 10
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 10	< 50	< 200	< 10
Dichloropropane, 1,2-	0.1	µg/L	na	< 10	< 50	< 200	< 10
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 140[1]	< 570[1]	< 28[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 100	< 400	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 100	< 400	< 20
Ethylbenzene	0.1	µg/L	8	< 10[1]	< 50[1]	< 200[1]	< 10[1]
Ethylene Dibromide	0.2	µg/L	na	< 20	< 100	< 400	< 20
Hexane (n)	0.5	µg/L	na	< 50	< 250	< 1,000	< 50
Methyl Ethyl Ketone	5	µg/L	400	< 500[1]	< 2,500[1]	< 10,000[1]	< 500[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 500	< 2,500[1]	< 10,000[1]	< 500
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 20	< 100	< 400[1]	< 20
Methylene Chloride	0.5	µg/L	na	< 50	< 250	< 1,000	< 50
Styrene	0.2	µg/L	4	< 20[1]	< 100[1]	< 400[1]	< 20[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 10	< 100[1]	< 400[1]	< 10
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 20	< 100[1]	< 400[1]	< 20
Tetrachloroethylene	0.1	µg/L	50	< 10	< 50	< 200[1]	< 10
Toluene	0.2	µg/L	0.8	< 20[1]	< 100[1]	< 400[1]	***23***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 10	< 50[1]	< 200[1]	< 10
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 20	< 100	< 400	< 20
Trichloroethylene	0.1	µg/L	20	< 10	< 50[1]	< 200[1]	< 10
Trichlorofluoromethane	0.2	µg/L	na	< 20	< 100	< 400	< 20
Vinyl Chloride	0.2	µg/L	600	< 20	< 100	< 400	< 20
Xylenes, m+p-	0.1	µg/L	32	< 10	< 50[1]	< 200[1]	20
Xylenes, o-	0.1	µg/L	40	< 10	< 50[1]	< 200[1]	11
Xylenes	0.1	µg/L	72	< 10	< 50	< 200[1]	31
Dibromoethane, 1,2-	0.2	µg/L	na	< 20	< 100	< 400	< 20
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 100	< 400	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 100	< 400	< 20

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-54B OY2671 MW12-54B-09212012 2012/09/21	MW12-54B YF6675 MW12-54B-10272014 2014/10/27	MW12-56 OJ7930 MW12-56-08012012 2012/08/01	MW12-61 OJ7931 MW12-61-08012012 2012/08/01
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	330	< 2,000	19	< 2,500
Benzene	0.1	µg/L	100	***160***	74	< 0.1	< 25
Bromodichloromethane	0.1	µg/L	200	< 2.5	< 20	< 0.1	< 25
Bromoform	0.2	µg/L	60	< 5	< 40	< 0.2	< 50
Bromomethane	0.5	µg/L	0.9	< 13[1]	< 100[1]	< 0.5	< 130[1]
Carbon Tetrachloride	0.1	µg/L	na	< 2.5	< 20	< 0.1	< 25
Chlorobenzene	0.1	µg/L	15	< 2.5	***280***	< 0.1	***950***
Chloroform	0.1	µg/L	na	13	< 20	< 0.1	< 25
Dibromochloromethane	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 5[1]	***4,900***	< 0.2	***12,000***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 5[1]	***140***	< 0.2	***310***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 5[1]	***340***	< 0.2	***620***
Dichlorodifluoromethane	0.5	µg/L	na	< 13	< 100	< 0.5	< 130
Dichloroethane, 1,1-	0.1	µg/L	200	< 2.5	< 20	< 0.1	< 25
Dichloroethane, 1,2-	0.2	µg/L	100	< 5	< 40	< 0.2	< 50
Dichloroethylene, 1,1-	0.1	µg/L	40	< 2.5	< 20	< 0.1	< 25
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 2.5	< 20	0.12	< 25
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 2.5	< 20	< 0.1	< 25
Dichloropropane, 1,2-	0.1	µg/L	na	< 2.5	< 20	< 0.1	< 25
Dichloropropene, 1,3-	0.28	µg/L	7	< 7.1[1]	< 57[1]	< 0.28	< 71[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Ethylbenzene	0.1	µg/L	8	3.9	< 20[1]	< 0.1	< 25[1]
Ethylene Dibromide	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Hexane (n)	0.5	µg/L	na	< 13	< 100	< 0.5	< 130
Methyl Ethyl Ketone	5	µg/L	400	< 130	< 1,000[1]	< 5	< 1,300[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 130	< 1,000[1]	< 5	< 1,300[1]
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 5	< 40	< 0.2	< 50
Methylene Chloride	0.5	µg/L	na	< 13	< 100	< 0.5	< 130
Styrene	0.2	µg/L	4	< 5[1]	< 40[1]	0.44	< 50[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 5	< 40[1]	< 0.2	< 50[1]
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 5	< 40	< 0.2	< 50
Tetrachloroethylene	0.1	µg/L	50	< 2.5	< 20	< 0.1	< 25
Toluene	0.2	µg/L	0.8	***25***	< 40[1]	< 0.2	< 50[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 2.5	< 20[1]	< 0.1	< 25[1]
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 5	< 40	< 0.2	< 50
Trichloroethylene	0.1	µg/L	20	< 2.5	< 20	< 0.1	< 25[1]
Trichlorofluoromethane	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Vinyl Chloride	0.2	µg/L	600	< 5	< 40	< 0.2	< 50
Xylenes, m+p-	0.1	µg/L	32	24	< 20	0.19	< 25
Xylenes, o-	0.1	µg/L	40	4.6	< 20	< 0.1	< 25
Xylenes	0.1	µg/L	72	28	< 20	0.19	< 25
Dibromoethane, 1,2-	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 5	< 40	< 0.2	< 50
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 5	< 40	< 0.2	< 50

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Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-61 OY2673 MW12-61-09212012 2012/09/21	MW12-61 YF6698 MW12-61-10272014 2014/10/27	MW12-61A ON0424 MW12-61A-08152012 2012/08/15	MW12-61A OY2672 MW12-61A-09212012 2012/09/21
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 5,000	< 5,000	< 10	< 10
Benzene	0.1	µg/L	100	< 50	< 50	0.58	0.82
Bromodichloromethane	0.1	µg/L	200	< 50	< 50	2.4	0.4
Bromoform	0.2	µg/L	60	< 100[1]	< 100[1]	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 250[1]	< 250[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 50	< 50	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	***490***	***650***	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 50	< 50	19	11
Dibromochloromethane	0.2	µg/L	na	< 100	< 100	0.36	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***5,300***	***6,400***	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***150***	***160***	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***350***	***330***	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 250	< 250	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 50	< 50	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 100	< 100	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 50[1]	< 50[1]	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 50	< 50	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 50	< 50	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 50	< 50	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 140[1]	< 140[1]	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 50[1]	< 50[1]	0.43	0.21
Ethylene Dibromide	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 250	< 250	0.68	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 2,500[1]	< 2,500[1]	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 2,500[1]	< 2,500[1]	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 100	< 100	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 250	< 250	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 100[1]	< 100[1]	< 0.2	0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 100[1]	< 100[1]	< 0.1	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 100[1]	< 100[1]	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 50	< 50	< 0.1	0.34
Toluene	0.2	µg/L	0.8	< 100[1]	< 100[1]	***0.93***	***2.3***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 50[1]	< 50[1]	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 100	< 100	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 50[1]	< 50[1]	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 100	< 100	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 50[1]	< 50[1]	0.37	1.6
Xylenes, o-	0.1	µg/L	40	< 50[1]	< 50[1]	0.36	0.67
Xylenes	0.1	µg/L	72	< 50	< 50	0.72	2.2
Dibromoethane, 1,2-	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 100	< 100	< 0.2	< 0.2

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-61A YF6699 MW12-61A-10272014 2014/10/27	MW12-61B ON0425 MW12-61B-08152012 2012/08/15	MW12-61B OY2674 MW12-61B-09212012 2012/09/21	MW12-65 NG1940 MW12-65-04252012 2012/04/25
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 20	< 10
Benzene	0.1	µg/L	100	1.6	0.74	7.4	0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	2.1	0.29	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.4	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 1[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.2	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.2	< 0.1
Chloroform	0.1	µg/L	na	0.39	19	6.7	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	0.3	< 0.4	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.4	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 1	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.2	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.4	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.2	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.2	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.2	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.2	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.57	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.33	0.38	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 1	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 10	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 10	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.4	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 1	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.4	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.1	< 0.4	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.4	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	0.31	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	***4.7***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.2	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.4	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.2	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.4	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	0.42	4.1	0.16
Xylenes, o-	0.1	µg/L	40	< 0.1	0.22	2	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	0.64	6.1	0.16
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.4	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
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Field Screen - organic vapour meter reading
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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-77 NG1938/DH5258 MW12-77-04252012 2012/04/25	MW12-77 NG1939/DH5259 MW12-77-200-04252012 2012/04/25 Duplicate of MW12-77	MW12-77 OJ7905 MW12-77-07302012 2012/07/30
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 1,000	< 1,000	< 1,000
Benzene	0.1	µg/L	100	< 10	< 10	< 10
Bromodichloromethane	0.1	µg/L	200	< 10	< 10	< 10
Bromoform	0.2	µg/L	60	< 20	< 20	< 20
Bromomethane	0.5	µg/L	0.9	< 50[1]	< 50[1]	< 50[1]
Carbon Tetrachloride	0.1	µg/L	na	< 10	< 10	< 10
Chlorobenzene	0.1	µg/L	15	***890***	***830***	***770***
Chloroform	0.1	µg/L	na	< 10	< 10	< 10
Dibromochloromethane	0.2	µg/L	na	< 20	< 20	< 20
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***2,100***	***2,000***	***2,300***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***69***	***65***	***77***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***170***	***160***	***150***
Dichlorodifluoromethane	0.5	µg/L	na	< 50	< 50	< 50
Dichloroethane, 1,1-	0.1	µg/L	200	< 10	< 10	< 10
Dichloroethane, 1,2-	0.2	µg/L	100	< 20	< 20	< 20
Dichloroethylene, 1,1-	0.1	µg/L	40	< 10	< 10	< 10
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 10	< 10	< 10
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 10	< 10	< 10
Dichloropropane, 1,2-	0.1	µg/L	na	< 10	< 10	< 10
Dichloropropene, 1,3-	0.28	µg/L	7	-	-	< 28[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 20	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 20	< 20
Ethylbenzene	0.1	µg/L	8	< 10[1]	< 10[1]	< 10[1]
Ethylene Dibromide	0.2	µg/L	na	< 20	< 20	< 20
Hexane (n)	0.5	µg/L	na	< 50	< 50	< 50
Methyl Ethyl Ketone	5	µg/L	400	< 500[1]	< 500[1]	< 500[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 500	< 500	< 500
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 20	< 20	< 20
Methylene Chloride	0.5	µg/L	na	< 50	< 50	< 50
Styrene	0.2	µg/L	4	< 20[1]	< 20[1]	< 20[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 20	< 20	< 20
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 20	< 20	< 20
Tetrachloroethylene	0.1	µg/L	50	< 10	< 10	< 10
Toluene	0.2	µg/L	0.8	< 20[1]	< 20[1]	< 20[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 10	< 10	< 10
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 20	< 20	< 20
Trichloroethylene	0.1	µg/L	20	< 10	< 10	< 10
Trichlorofluoromethane	0.2	µg/L	na	< 20	< 20	< 20
Vinyl Chloride	0.2	µg/L	600	< 20	< 20	< 20
Xylenes, m+p-	0.1	µg/L	32	< 10	< 10	< 10
Xylenes, o-	0.1	µg/L	40	< 10	< 10	< 10
Xylenes	0.1	µg/L	72	< 10	< 10	< 10
Dibromoethane, 1,2-	0.2	µg/L	na	< 20	< 20	< 20
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 20	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 20	< 20

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-77 OJ7906 MW12-77-200-07302012 2012/07/30 Duplicate of MW12-77	MW12-77 YF6649 MW12-77-10292014 2014/10/29	MW12-77A OJ7935 MW12-77A-08022012 2012/08/02
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 1,000	< 100	64
Benzene	0.1	µg/L	100	< 10	< 1	2.6
Bromodichloromethane	0.1	µg/L	200	< 10	< 1	< 0.25
Bromoform	0.2	µg/L	60	< 20	< 2	< 0.5
Bromomethane	0.5	µg/L	0.9	< 50[1]	< 5[1]	< 1.3[1]
Carbon Tetrachloride	0.1	µg/L	na	< 10	< 1	< 0.25
Chlorobenzene	0.1	µg/L	15	***740***	***84***	***28***
Chloroform	0.1	µg/L	na	< 10	< 1	3.4
Dibromochloromethane	0.2	µg/L	na	< 20	< 2	< 0.5
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***2,300***	***290***	***37***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***75***	***8.3***	0.7
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***150***	***14***	1.5
Dichlorodifluoromethane	0.5	µg/L	na	< 50	< 5	< 1.3
Dichloroethane, 1,1-	0.1	µg/L	200	< 10	< 1	< 0.25
Dichloroethane, 1,2-	0.2	µg/L	100	< 20	< 2	< 0.5
Dichloroethylene, 1,1-	0.1	µg/L	40	< 10	< 1	< 0.25
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 10	< 1	< 0.25
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 10	< 1	< 0.25
Dichloropropane, 1,2-	0.1	µg/L	na	< 10	< 1	< 0.25
Dichloropropene, 1,3-	0.28	µg/L	7	< 28[1]	< 2.8	< 0.71
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 2	< 0.5
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 2	< 0.5
Ethylbenzene	0.1	µg/L	8	< 10[1]	< 1	0.29
Ethylene Dibromide	0.2	µg/L	na	< 20	< 2	< 0.5
Hexane (n)	0.5	µg/L	na	< 50	< 5	< 1.3
Methyl Ethyl Ketone	5	µg/L	400	< 500[1]	< 50	< 13
Methyl Isobutyl Ketone	5	µg/L	600	< 500	< 50	< 13
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 20	< 2	< 0.5
Methylene Chloride	0.5	µg/L	na	< 50	< 5	< 1.3
Styrene	0.2	µg/L	4	< 20[1]	< 2	< 0.5
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 20	< 2	< 0.5
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 20	< 2	< 0.5
Tetrachloroethylene	0.1	µg/L	50	< 10	< 1	< 0.25
Toluene	0.2	µg/L	0.8	< 20[1]	< 2[1]	***3.7***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 10	< 1	< 0.25
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 20	< 2	< 0.5
Trichloroethylene	0.1	µg/L	20	< 10	< 1	< 0.25
Trichlorofluoromethane	0.2	µg/L	na	< 20	< 2	< 0.5
Vinyl Chloride	0.2	µg/L	600	< 20	< 2	< 0.5
Xylenes, m+p-	0.1	µg/L	32	< 10	< 1	2.2
Xylenes, o-	0.1	µg/L	40	< 10	< 1	0.89
Xylenes	0.1	µg/L	72	< 10	< 1	3.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 20	< 2	< 0.5
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 2	< 0.5
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 2	< 0.5

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-77A OJ7936 MW12-77A-200-08022012 2012/08/02 Duplicate of MW12-77A	MW12-77A VA3463 MW12-77A-02242014 2014/02/24	MW12-77A YF6647 MW12-77A-10292014 2014/10/29
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	61	84	38
Benzene	0.1	µg/L	100	2.3	6	3.3
Bromodichloromethane	0.1	µg/L	200	< 0.25	< 0.1	< 0.2
Bromoform	0.2	µg/L	60	< 0.5	< 0.2	< 0.4
Bromomethane	0.5	µg/L	0.9	< 1.3[1]	< 0.5	< 1[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.25	< 0.1	< 0.2
Chlorobenzene	0.1	µg/L	15	***25***	7.3	1.4
Chloroform	0.1	µg/L	na	2.8	< 0.1	< 0.2
Dibromochloromethane	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***34***	***6***	1.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	0.67	< 0.2	< 0.4
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	1.4	0.43	< 0.4
Dichlorodifluoromethane	0.5	µg/L	na	< 1.3	< 0.5	< 1
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.25	< 0.1	< 0.2
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.5	< 0.2	< 0.4
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.25	< 0.1	< 0.2
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.25	< 0.1	< 0.2
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.25	< 0.1	< 0.2
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.25	< 0.1	< 0.2
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.71	< 0.28	< 0.57
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Ethylbenzene	0.1	µg/L	8	0.26	0.63	0.25
Ethylene Dibromide	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Hexane (n)	0.5	µg/L	na	< 1.3	< 0.5	< 1
Methyl Ethyl Ketone	5	µg/L	400	< 13	13	26
Methyl Isobutyl Ketone	5	µg/L	600	< 13	< 5	< 10
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.5	< 0.2	< 0.4
Methylene Chloride	0.5	µg/L	na	< 1.3	< 0.5	< 1
Styrene	0.2	µg/L	4	< 0.5	0.63	< 0.4
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.5	< 0.1	< 0.4
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.5	< 0.2	< 0.4
Tetrachloroethylene	0.1	µg/L	50	< 0.25	< 0.1	< 0.2
Toluene	0.2	µg/L	0.8	***3.3***	***10***	***4.6***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.25	< 0.1	< 0.2
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.5	< 0.2	< 0.4
Trichloroethylene	0.1	µg/L	20	< 0.25	< 0.1	< 0.2
Trichlorofluoromethane	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Vinyl Chloride	0.2	µg/L	600	< 0.5	< 0.2	< 0.4
Xylenes, m+p-	0.1	µg/L	32	1.9	5.8	1.8
Xylenes, o-	0.1	µg/L	40	0.74	1.7	0.85
Xylenes	0.1	µg/L	72	2.7	7.5	2.6
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.5	< 0.2	< 0.4
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.5	< 0.2	< 0.4

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-77B	MW12-77B	MW12-79	MW12-79
	Laboratory Sample ID			OJ7941	YF6648	DH5257	ED3292
	Sample Location			MW12-77B-08022012	MW12-77B-10292014	MW12-79-04252012	MW12-79-08022012
	Sampling Date (yyyy/mm/dd)			2012/08/02	2014/10/29	2012/04/25	2012/08/02
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 50	67	-	-
Benzene	0.1	µg/L	100	3.1	5.6	-	-
Bromodichloromethane	0.1	µg/L	200	< 0.5	< 0.25	-	-
Bromoform	0.2	µg/L	60	< 1	< 0.5	-	-
Bromomethane	0.5	µg/L	0.9	< 2.5[1]	< 1.3[1]	-	-
Carbon Tetrachloride	0.1	µg/L	na	< 0.5	< 0.25	-	-
Chlorobenzene	0.1	µg/L	15	***32***	1.5	-	-
Chloroform	0.1	µg/L	na	1.2	< 0.25	-	-
Dibromochloromethane	0.2	µg/L	na	< 1	< 0.5	-	-
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***35***	2	-	-
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 1	< 0.5	-	-
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	2.1	< 0.5	-	-
Dichlorodifluoromethane	0.5	µg/L	na	< 2.5	< 1.3	-	-
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.5	< 0.25	-	-
Dichloroethane, 1,2-	0.2	µg/L	100	< 1	< 0.5	-	-
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.5	< 0.25	-	-
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.5	< 0.25	-	-
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.5	< 0.25	-	-
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.5	< 0.25	-	-
Dichloropropene, 1,3-	0.28	µg/L	7	< 1.4	< 0.71	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.5	-	-
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.5	-	-
Ethylbenzene	0.1	µg/L	8	0.53	0.43	-	-
Ethylene Dibromide	0.2	µg/L	na	< 1	< 0.5	-	-
Hexane (n)	0.5	µg/L	na	< 2.5	< 1.3	-	-
Methyl Ethyl Ketone	5	µg/L	400	< 25	34	-	-
Methyl Isobutyl Ketone	5	µg/L	600	< 25	< 13	-	-
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 1	< 0.5	-	-
Methylene Chloride	0.5	µg/L	na	< 2.5	< 1.3	-	-
Styrene	0.2	µg/L	4	< 1	< 0.5	-	-
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 0.5	-	-
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 1	< 0.5	-	-
Tetrachloroethylene	0.1	µg/L	50	< 0.5	< 0.25	-	-
Toluene	0.2	µg/L	0.8	***3.1***	***4.3***	-	-
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.5	< 0.25	-	-
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 1	< 0.5	-	-
Trichloroethylene	0.1	µg/L	20	< 0.5	< 0.25	-	-
Trichlorofluoromethane	0.2	µg/L	na	< 1	< 0.5	-	-
Vinyl Chloride	0.2	µg/L	600	< 1	< 0.5	-	-
Xylenes, m+p-	0.1	µg/L	32	4.2	3.6	-	-
Xylenes, o-	0.1	µg/L	40	1.5	1.2	-	-
Xylenes	0.1	µg/L	72	5.7	4.9	-	-
Dibromoethane, 1,2-	0.2	µg/L	na	< 1	< 0.5	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.5	-	-
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.5	-	-

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Laboratory analysis by
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< - Denotes concentration less than indicated detection limit
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Field Screen - organic vapour meter reading
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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-79 NG1937 MW12-79-04252012 2012/04/25	MW12-79 OJ7908 MW12-79-07302012 2012/07/30	MW12-79 OY2675 MW12-79-09212012 2012/09/21	MW12-79A OJ7937 MW12-79A-08022012 2012/08/02
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 200	< 10	< 10	< 50
Benzene	0.1	µg/L	100	2.7	< 0.1	< 0.1	2.2
Bromodichloromethane	0.1	µg/L	200	< 2	< 0.1	< 0.1	< 0.5
Bromoform	0.2	µg/L	60	< 4	< 0.2	< 0.2	< 1
Bromomethane	0.5	µg/L	0.9	< 10[1]	< 0.5	< 0.5	< 2.5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 2	< 0.1	< 0.1	< 0.5
Chlorobenzene	0.1	µg/L	15	***130***	< 0.1	< 0.1	***39***
Chloroform	0.1	µg/L	na	< 2	< 0.1	< 0.1	< 0.5
Dibromochloromethane	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***20***	< 0.2	< 0.2	***7.2***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***6.8***	< 0.2	< 0.2	< 1
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***21***	< 0.2	< 0.2	2.2
Dichlorodifluoromethane	0.5	µg/L	na	< 10	< 0.5	< 0.5	< 2.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 2	< 0.1	< 0.1	< 0.5
Dichloroethane, 1,2-	0.2	µg/L	100	< 4	< 0.2	< 0.2	< 1
Dichloroethylene, 1,1-	0.1	µg/L	40	< 2	< 0.1	< 0.1	< 0.5
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 2	< 0.1	< 0.1	< 0.5
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 2	< 0.1	< 0.1	< 0.5
Dichloropropane, 1,2-	0.1	µg/L	na	< 2	< 0.1	< 0.1	< 0.5
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	< 0.28	< 1.4
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Ethylbenzene	0.1	µg/L	8	< 2	< 0.1	< 0.1	< 0.5
Ethylene Dibromide	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Hexane (n)	0.5	µg/L	na	< 10	< 0.5	< 0.5	< 2.5
Methyl Ethyl Ketone	5	µg/L	400	< 100	< 5	< 5	< 25
Methyl Isobutyl Ketone	5	µg/L	600	< 100	< 5	< 5	< 25
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 4	< 0.2	< 0.2	< 1
Methylene Chloride	0.5	µg/L	na	< 10	< 0.5	< 0.5	< 2.5
Styrene	0.2	µg/L	4	< 4	< 0.2	< 0.2	< 1
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 4	< 0.2	< 0.2	< 1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 4	< 0.2	< 0.2	< 1
Tetrachloroethylene	0.1	µg/L	50	< 2	< 0.1	0.27	< 0.5
Toluene	0.2	µg/L	0.8	< 4[1]	< 0.2	< 0.2	***1.2***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 2	< 0.1	< 0.1	< 0.5
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 4	< 0.2	< 0.2	< 1
Trichloroethylene	0.1	µg/L	20	< 2	< 0.1	< 0.1	< 0.5
Trichlorofluoromethane	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Vinyl Chloride	0.2	µg/L	600	< 4	< 0.2	< 0.2	< 1
Xylenes, m+p-	0.1	µg/L	32	< 2	< 0.1	< 0.1	< 0.5
Xylenes, o-	0.1	µg/L	40	< 2	< 0.1	< 0.1	< 0.5
Xylenes	0.1	µg/L	72	< 2	< 0.1	< 0.1	< 0.5
Dibromoethane, 1,2-	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 4	< 0.2	< 0.2	< 1

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µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-79A	MW12-79B	MW12-79B
	Laboratory Sample ID			OY2677	OJ7942	OY2676
	Sample Location			MW12-79A-09212012	MW12-79B-08022012	MW12-79B-09212012
	Sampling Date (yyyy/mm/dd)			2012/09/21	2012/08/02	2012/09/21
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 20	< 500	130
Benzene	0.1	µg/L	100	2	21	21
Bromodichloromethane	0.1	µg/L	200	< 0.2	< 5	< 1
Bromoform	0.2	µg/L	60	< 0.4	< 10	< 2
Bromomethane	0.5	µg/L	0.9	< 1[1]	< 25[1]	< 5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.2	< 5	< 1
Chlorobenzene	0.1	µg/L	15	13	***350***	***82***
Chloroform	0.1	µg/L	na	0.55	< 5	< 1
Dibromochloromethane	0.2	µg/L	na	< 0.4	< 10	< 2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***3.5***	***32***	***5.7***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	1	< 10[1]	< 2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	2.2	***20***	***4.4***
Dichlorodifluoromethane	0.5	µg/L	na	< 1	< 25	< 5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.2	< 5	< 1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.4	< 10	< 2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.2	< 5	< 1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.2	< 5	< 1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.2	< 5	< 1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.2	< 5	< 1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.57	< 14[1]	< 2.8
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.4	< 10	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.4	< 10	< 2
Ethylbenzene	0.1	µg/L	8	0.38	< 5	1.3
Ethylene Dibromide	0.2	µg/L	na	< 0.4	< 10	< 2
Hexane (n)	0.5	µg/L	na	< 1	< 25	< 5
Methyl Ethyl Ketone	5	µg/L	400	< 10	< 250	< 50
Methyl Isobutyl Ketone	5	µg/L	600	< 10	< 250	< 50
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.4	< 10	< 2
Methylene Chloride	0.5	µg/L	na	< 1	< 25	< 5
Styrene	0.2	µg/L	4	0.55	< 10[1]	< 2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.4	< 10	< 2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.4	< 10	< 2
Tetrachloroethylene	0.1	µg/L	50	0.34	< 5	< 1
Toluene	0.2	µg/L	0.8	***2.5***	***21***	***31***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.2	< 5	< 1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.4	< 10	< 2
Trichloroethylene	0.1	µg/L	20	< 0.2	< 5	< 1
Trichlorofluoromethane	0.2	µg/L	na	< 0.4	< 10	< 2
Vinyl Chloride	0.2	µg/L	600	< 0.4	< 10	< 2
Xylenes, m+p-	0.1	µg/L	32	1.9	6.5	11
Xylenes, o-	0.1	µg/L	40	1.2	< 5	3.8
Xylenes	0.1	µg/L	72	3	6.5	14
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.4	< 10	< 2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.4	< 10	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.4	< 10	< 2

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	SNC-Lavalin Sample ID		PWQO[2]	MW12-79B	MW12-82	MW12-84	MW12-86
	Laboratory Sample ID			UY9126	NG1936	NG1935	NG1934
	Sample Location			MW12-79B-02212014	MW12-82-04242012	MW12-84-04232012	MW12-86-04232012
	Sampling Date (yyyy/mm/dd)			2014/02/21	2012/04/24	2012/04/23	2012/04/23
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	180	< 10	< 10	< 10
Benzene	0.1	µg/L	100	23	< 0.1	0.15	0.14
Bromodichloromethane	0.1	µg/L	200	< 1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 5[1]	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	***85***	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***5.6***	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***4.4***	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 2.8	-	-	-
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	2	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 5	< 0.5	0.54	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 50	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 50	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***51***	0.2	0.34	0.35
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 1	0.13	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 1	< 0.1	0.94	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	18	0.21	0.33	0.33
Xylenes, o-	0.1	µg/L	40	6.2	< 0.1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	24	0.21	0.33	0.33
Dibromoethane, 1,2-	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2	< 0.2

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Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-89 NG1933 MW12-89-04232012 2012/04/23	MW12-89 OJ7917 MW12-89-07302012 2012/07/30	MW12-90 NG1932 MW12-90-04232012 2012/04/23	MW12-92A OL7725 MW12-92A-08102012 2012/08/10
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	-	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.2	1.1
Bromodichloromethane	0.1	µg/L	200	0.17	< 0.1	-	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	-	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	-	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	-	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	-	< 0.1
Chloroform	0.1	µg/L	na	2.7	0.26	-	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	-	***8***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	-	0.27
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	-	0.53
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	-	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	-	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	-	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	-	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	0.28	0.3	-	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	-	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	-	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	-	< 0.28	-	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.2	0.5
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	-	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	-	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	-	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	-	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	-	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	-	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	-	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	-	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	-	< 0.1
Toluene	0.2	µg/L	0.8	0.23	< 0.2	< 0.2	***2.7***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	-	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	-	< 0.2
Trichloroethylene	0.1	µg/L	20	0.27	0.29	-	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	-	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.27	< 0.1	< 0.4	2.2
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	< 0.2	0.78
Xylenes	0.1	µg/L	72	0.27	< 0.1	< 0.4	3
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	-	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
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Field Screen - organic vapour meter reading
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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-94	MW12-94	MW12-94	MW12-94
	Laboratory Sample ID			OJ7932	OJ7933	YF6672	YF6673
	Sample Location			MW12-94-07312012	MW12-94-200-07312012	MW12-94-10272014	MW-99-10272014
	Sampling Date (yyyy/mm/dd)			2012/07/31	2012/07/31 Duplicate of MW12-94	2014/10/27	2014/10/27 Duplicate of MW12-94
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 5,000	< 5,000	< 20,000	< 20,000
Benzene	0.1	µg/L	100	***200***	***200***	< 200[1]	< 200[1]
Bromodichloromethane	0.1	µg/L	200	< 50	< 50	< 200	< 200
Bromoform	0.2	µg/L	60	< 100[1]	< 100[1]	< 400[1]	< 400[1]
Bromomethane	0.5	µg/L	0.9	< 250[1]	< 250[1]	< 1,000[1]	< 1,000[1]
Carbon Tetrachloride	0.1	µg/L	na	< 50	< 50	< 200	< 200
Chlorobenzene	0.1	µg/L	15	***6,600***	***6,600***	***2,600***	***2,600***
Chloroform	0.1	µg/L	na	< 50	< 50	< 200	< 200
Dibromochloromethane	0.2	µg/L	na	< 100	< 100	< 400	< 400
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***26,000***	***26,000***	***43,000***	***46,000***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***1,700***	***1,700***	***2,400***	***2,100***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***3,200***	***3,100***	***5,300***	***4,700***
Dichlorodifluoromethane	0.5	µg/L	na	< 250	< 250	< 1,000	< 1,000
Dichloroethane, 1,1-	0.1	µg/L	200	< 50	< 50	< 200	< 200
Dichloroethane, 1,2-	0.2	µg/L	100	< 100	< 100	< 400[1]	< 400[1]
Dichloroethylene, 1,1-	0.1	µg/L	40	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 50	< 50	< 200	< 200
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 50	< 50	< 200	< 200
Dichloropropane, 1,2-	0.1	µg/L	na	< 50	< 50	< 200	< 200
Dichloropropene, 1,3-	0.28	µg/L	7	< 140[1]	< 140[1]	< 570[1]	< 570[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 100	< 100	< 400	< 400
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 100	< 100	< 400	< 400
Ethylbenzene	0.1	µg/L	8	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Ethylene Dibromide	0.2	µg/L	na	< 100	< 100	< 400	< 400
Hexane (n)	0.5	µg/L	na	< 250	< 250	< 1,000	< 1,000
Methyl Ethyl Ketone	5	µg/L	400	< 2,500[1]	< 2,500[1]	< 10,000[1]	< 10,000[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 2,500[1]	< 2,500[1]	< 10,000[1]	< 10,000[1]
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 100	< 100	< 400[1]	< 400[1]
Methylene Chloride	0.5	µg/L	na	< 250	< 250	< 1,000	< 1,000
Styrene	0.2	µg/L	4	< 100[1]	< 100[1]	< 400[1]	< 400[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 100[1]	< 100[1]	< 400[1]	< 400[1]
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 100[1]	< 100[1]	< 400[1]	< 400[1]
Tetrachloroethylene	0.1	µg/L	50	< 50	< 50	< 200[1]	< 200[1]
Toluene	0.2	µg/L	0.8	< 100[1]	< 100[1]	< 400[1]	< 400[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 100	< 100	< 400	< 400
Trichloroethylene	0.1	µg/L	20	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Trichlorofluoromethane	0.2	µg/L	na	< 100	< 100	< 400	< 400
Vinyl Chloride	0.2	µg/L	600	< 100	< 100	< 400	< 400
Xylenes, m+p-	0.1	µg/L	32	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Xylenes, o-	0.1	µg/L	40	< 50[1]	< 50[1]	< 200[1]	< 200[1]
Xylenes	0.1	µg/L	72	< 50	< 50	< 200[1]	< 200[1]
Dibromoethane, 1,2-	0.2	µg/L	na	< 100	< 100	< 400	< 400
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 100	< 100	< 400	< 400
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 100	< 100	< 400	< 400

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µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-95A BAW169 MW12-95A-09232015 2015/09/23	MW12-95A OW4741 MW12-95A-09172012 2012/09/17	MW12-95A YF6669 MW12-95A-10272014 2014/10/27
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 100	< 25
Benzene	0.1	µg/L	100	1.2	2.3	1.8
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 1	< 0.25
Bromoform	0.2	µg/L	60	< 0.2	< 2	< 0.5
Bromomethane	0.5	µg/L	0.9	< 0.5	< 5[1]	< 1.3[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 1	< 0.25
Chlorobenzene	0.1	µg/L	15	6.3	2.5	***22***
Chloroform	0.1	µg/L	na	< 0.1	< 1	< 0.25
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 2	< 0.5
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***46***	***34***	***71***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***3.2***	< 2	***4.6***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***8***	3.6	***11***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 5	< 1.3
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 1	< 0.25
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 2	< 0.5
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 1	< 0.25
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.25
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.25
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.25
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 2.8	< 0.71
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.5
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.5
Ethylbenzene	0.1	µg/L	8	0.38	< 1	0.49
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 2	< 0.5
Hexane (n)	0.5	µg/L	na	< 0.5	< 5	< 1.3
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 50	< 13
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 50	< 13
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 2	< 0.5
Methylene Chloride	0.5	µg/L	na	< 0.5	< 5	< 1.3
Styrene	0.2	µg/L	4	< 0.2	< 2	< 0.5
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 2	< 0.5
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 2	< 0.5
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 1	< 0.25
Toluene	0.2	µg/L	0.8	***1.6***	< 2[1]	***2.3***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 1	< 0.25
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 2	< 0.5
Trichloroethylene	0.1	µg/L	20	< 0.1	< 1	< 0.25
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 2	< 0.5
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 2	< 0.5
Xylenes, m+p-	0.1	µg/L	32	0.94	1.3	2.1
Xylenes, o-	0.1	µg/L	40	0.58	< 1	0.96
Xylenes	0.1	µg/L	72	1.5	1.3	3.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 2	< 0.5
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.5
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.5

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BOLD Concentration greater than PWQO

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-98A ON0426 MW12-98A-08152012 2012/08/15	MW12-98A ON0452 MW12-98A-200-08152012 2012/08/15 Duplicate of MW12-98A	MW12-98B ON0427 MW12-98B-08152012 2012/08/15
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	1.2	1.2	11
Bromodichloromethane	0.1	µg/L	200	5.4	5.4	1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	32	39	32
Dibromochloromethane	0.2	µg/L	na	1.1	0.83	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	0.48	0.78	2.3
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	0.67
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	0.49	0.62
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***1.8***	***3.6***	***11***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.43	2.2	9.8
Xylenes, o-	0.1	µg/L	40	0.64	2	5.1
Xylenes	0.1	µg/L	72	1.1	4.2	15
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Groundwater Analytical Results
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	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-99A ON0428 MW12-99A-08152012 2012/08/15	MW12-99B ON0429 MW12-99B-08152012 2012/08/15	MW12-101A ON0430 MW12-101A-08152012 2012/08/15
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.26	21	6
Bromodichloromethane	0.1	µg/L	200	3.8	0.77	1.9
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	3.2	< 0.1
Chloroform	0.1	µg/L	na	21	23	19
Dibromochloromethane	0.2	µg/L	na	0.61	< 0.2	0.33
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.94	***49***	0.49
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	***9.8***	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***14***	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	3	1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	1.2	0.79
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	0.86	< 0.5
Styrene	0.2	µg/L	4	0.3	< 0.2	0.83
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	0.21	***42***	***8.2***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.14	12	2.6
Xylenes, o-	0.1	µg/L	40	< 0.1	11	2.6
Xylenes	0.1	µg/L	72	0.14	23	5.2
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-101B	MW12-102	MW12-102A
	Laboratory Sample ID			ON0431	OJ7928	ON0432
	Sample Location			MW12-101B-08152012	MW12-102-08012012	MW12-102A-08152012
	Sampling Date (yyyy/mm/dd)			2012/08/15	2012/08/01	2012/08/15
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 1,000	< 10,000	< 10
Benzene	0.1	µg/L	100	15	< 100	4.4
Bromodichloromethane	0.1	µg/L	200	< 10	< 100	3.7
Bromoform	0.2	µg/L	60	< 20	< 200[1]	< 0.2
Bromomethane	0.5	µg/L	0.9	< 50[1]	< 500[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 10	< 100	< 0.1
Chlorobenzene	0.1	µg/L	15	***100***	***660***	3.6
Chloroform	0.1	µg/L	na	31	< 100	29
Dibromochloromethane	0.2	µg/L	na	< 20	< 200	0.7
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***1,200***	***38,000***	1.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***140***	***3,900***	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***260***	***5,600***	0.73
Dichlorodifluoromethane	0.5	µg/L	na	< 50	< 500	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 10	< 100	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 20	< 200[1]	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 10	< 100[1]	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 10	< 100	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 10	< 100	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 10	< 100	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 28[1]	< 280[1]	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 200	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 200	< 0.2
Ethylbenzene	0.1	µg/L	8	< 10[1]	< 100[1]	1.6
Ethylene Dibromide	0.2	µg/L	na	< 20	< 200	< 0.2
Hexane (n)	0.5	µg/L	na	< 50	< 500	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 500[1]	< 5,000[1]	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 500	< 5,000[1]	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 20	< 200	< 0.2
Methylene Chloride	0.5	µg/L	na	< 50	< 500	< 0.5
Styrene	0.2	µg/L	4	< 20[1]	< 200[1]	0.57
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 10	< 200[1]	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 20	< 200[1]	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 10	< 100[1]	< 0.1
Toluene	0.2	µg/L	0.8	***33***	< 200[1]	***8.6***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 10	< 100[1]	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 20	< 200	< 0.2
Trichloroethylene	0.1	µg/L	20	< 10	< 100[1]	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 20	< 200	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 20	< 200	< 0.2
Xylenes, m+p-	0.1	µg/L	32	22	< 100[1]	2.7
Xylenes, o-	0.1	µg/L	40	11	< 100[1]	5.2
Xylenes	0.1	µg/L	72	33	< 100[1]	8
Dibromoethane, 1,2-	0.2	µg/L	na	< 20	< 200	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 200	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 200	< 0.2

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-102B ON0451 MW12-102B-08152012 2012/08/15	MW12-104 OJ7929 MW12-104-08012012 2012/08/01	MW12-104 XS4749 MW-104-09232014 2014/09/23	MW12-104A OJ7938 MW12-104A-08022012 2012/08/02
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 100	44
Benzene	0.1	µg/L	100	2.4	< 0.1	< 1	0.67
Bromodichloromethane	0.1	µg/L	200	2	< 0.1	< 1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 5[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 0.1
Chlorobenzene	0.1	µg/L	15	0.29	< 0.1	12	< 0.1
Chloroform	0.1	µg/L	na	28	< 0.1	< 1	0.22
Dibromochloromethane	0.2	µg/L	na	0.29	< 0.2	< 2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	1.4	< 0.2	***46***	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	3.4	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 2.8	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Ethylbenzene	0.1	µg/L	8	1.7	< 0.1	< 1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Hexane (n)	0.5	µg/L	na	1.3	< 0.5	< 5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 50	< 6
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 50	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 5	< 0.5
Styrene	0.2	µg/L	4	0.75	0.25	< 2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 1	< 0.1
Toluene	0.2	µg/L	0.8	***12***	< 0.2	< 2[1]	0.35
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	5.8	0.13	< 1	< 0.1
Xylenes, o-	0.1	µg/L	40	5	< 0.1	< 1	1.6
Xylenes	0.1	µg/L	72	11	0.13	< 1	1.6
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2	< 0.2

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW12-104A XS4750 MW-104A-09232014 2014/09/23	MW12-104B OJ7939 MW12-104B-07312012 2012/07/31	MW12-104B OJ7940 MW12-104B-200-07312012 2012/07/31 Duplicate of MW12-104B
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 50	< 17	< 16
Benzene	0.1	µg/L	100	37	3.9	3.1
Bromodichloromethane	0.1	µg/L	200	< 0.5	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 1	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 2.5[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.5	0.22	0.21
Chloroform	0.1	µg/L	na	< 0.5	0.12	0.12
Dibromochloromethane	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 1	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 1	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 1	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 2.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.5	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 1	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.5	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 1.4	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	0.62	0.37	0.3
Ethylene Dibromide	0.2	µg/L	na	< 1	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 2.5	5.3	4.3
Methyl Ethyl Ketone	5	µg/L	400	< 25	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 25	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 1	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 2.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 1	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 1	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.5	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***4.4***	***7.5***	***6.1***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.5	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 1	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.5	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 1	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 1	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	1.6	3.7	3.1
Xylenes, o-	0.1	µg/L	40	< 0.5	1.1	0.93
Xylenes	0.1	µg/L	72	1.6	4.8	4.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-104B	MW12-104B	MW14-79	MW14-79
	Laboratory Sample ID			XS4751	XS4752	BAW139	YN5734
	Sample Location			MW-104B-09232014	MW-99-09232014	MW14-79-09222015	MW14-79-11192014
	Sampling Date (yyyy/mm/dd)			2014/09/23	2014/09/23 Duplicate of MW12-104B	2015/09/22	2014/11/19
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 100	< 100	< 1,000	< 1,000
Benzene	0.1	µg/L	100	13	13	< 10	< 10
Bromodichloromethane	0.1	µg/L	200	< 1	< 1	< 10	< 10
Bromoform	0.2	µg/L	60	< 2	< 2	< 20	< 20
Bromomethane	0.5	µg/L	0.9	< 5[1]	< 5[1]	< 50[1]	< 50[1]
Carbon Tetrachloride	0.1	µg/L	na	< 1	< 1	< 10	< 10
Chlorobenzene	0.1	µg/L	15	***35***	***37***	***230***	***51***
Chloroform	0.1	µg/L	na	< 1	< 1	< 10	< 10
Dibromochloromethane	0.2	µg/L	na	< 2	< 2	< 20	< 20
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***270***	***280***	***9,900***	***2,000***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***9.3***	***10***	***500***	***110***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***23***	***25***	***1,200***	***230***
Dichlorodifluoromethane	0.5	µg/L	na	< 5	< 5	< 50	< 50
Dichloroethane, 1,1-	0.1	µg/L	200	< 1	< 1	< 10	< 10
Dichloroethane, 1,2-	0.2	µg/L	100	< 2	< 2	< 20	< 20
Dichloroethylene, 1,1-	0.1	µg/L	40	< 1	< 1	< 10	< 10
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 1	< 1	< 10	< 10
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 1	< 1	< 10	< 10
Dichloropropane, 1,2-	0.1	µg/L	na	< 1	< 1	< 10	< 10
Dichloropropene, 1,3-	0.28	µg/L	7	< 2.8	< 2.8	< 28[1]	< 28[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 2	< 20	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 2	< 20	< 20
Ethylbenzene	0.1	µg/L	8	< 1	< 1	< 10[1]	< 10[1]
Ethylene Dibromide	0.2	µg/L	na	< 2	< 2	< 20	< 20
Hexane (n)	0.5	µg/L	na	< 5	< 5	< 50	< 50
Methyl Ethyl Ketone	5	µg/L	400	< 50	< 50	< 500[1]	< 500[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 50	< 50	< 500	< 500
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 2	< 2	< 20	< 20
Methylene Chloride	0.5	µg/L	na	< 5	< 5	< 50	< 50
Styrene	0.2	µg/L	4	< 2	< 2	< 20[1]	< 20[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 2	< 2	< 10	< 10
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 2	< 2	< 20	< 20
Tetrachloroethylene	0.1	µg/L	50	< 1	< 1	< 10	< 10
Toluene	0.2	µg/L	0.8	***7.3***	***7.7***	< 20[1]	< 20[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 1	< 1	< 10	< 10
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 2	< 2	< 20	< 20
Trichloroethylene	0.1	µg/L	20	< 1	< 1	< 10	< 10
Trichlorofluoromethane	0.2	µg/L	na	< 2	< 2	< 20	< 20
Vinyl Chloride	0.2	µg/L	600	< 2	< 2	< 20	< 20
Xylenes, m+p-	0.1	µg/L	32	2.1	2.2	< 10	< 10
Xylenes, o-	0.1	µg/L	40	< 1	< 1	< 10	< 10
Xylenes	0.1	µg/L	72	2.1	2.2	< 10	< 10
Dibromoethane, 1,2-	0.2	µg/L	na	< 2	< 2	< 20	< 20
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 2	< 20	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 2	< 20	< 20

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Laboratory analysis by
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Field Screen - organic vapour meter reading
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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-79A	MW14-79A	MW14-79B	MW14-106
	Laboratory Sample ID			BAW168	YN5725	YN5717	BIN691
	Sample Location			MW14-79A-09242015	MW14-79A-11182014	MW14-79B-11182014	MW14-106-11102015
	Sampling Date (yyyy/mm/dd)			2015/09/24	2014/11/18	2014/11/18	2015/11/10
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	2.7	4.2	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	1.5	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	0.53	1.3	< 0.1
Chloroform	0.1	µg/L	na	0.24	14	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.97	***20***	***17***	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	0.79	***14***	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	0.43	1.9	***33***	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	0.4	0.65	0.66	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	***1.4***	***7.5***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	0.12
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.3	< 0.1	4.5	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	2.4	2.6	< 0.1
Xylenes	0.1	µg/L	72	0.3	2.4	7.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-106	MW14-107	MW14-107	MW14-107
	Laboratory Sample ID			YF6619	UY9119	YF6613	YF6614
	Sample Location			MW14-106-10282014	MW14-107-02202014	MW14-107-10282014	MW-98-10282014
	Sampling Date (yyyy/mm/dd)			2014/10/28	2014/02/20	2014/10/28	2014/10/28 Duplicate of MW14-107
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 500	< 500	< 500
Benzene	0.1	µg/L	100	< 0.1	< 5	< 5	< 5
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 5	< 5	< 5
Bromoform	0.2	µg/L	60	< 0.2	< 10	< 10	< 10
Bromomethane	0.5	µg/L	0.9	< 0.5	< 25[1]	< 25[1]	< 25[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 5	< 5	< 5
Chlorobenzene	0.1	µg/L	15	0.55	***240***	***250***	***240***
Chloroform	0.1	µg/L	na	< 0.1	< 5	< 5	< 5
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	***150***	***110***	***110***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	***19***	***16***	***16***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***49***	***38***	***37***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 25	< 25	< 25
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 5	< 5	< 5
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 10	< 10	< 10
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 5	< 5	< 5
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 5	< 5	< 5
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 5	< 5	< 5
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 5	< 5	< 5
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 14[1]	< 14[1]	< 14[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Ethylbenzene	0.1	µg/L	8	< 0.1	< 5	< 5	< 5
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Hexane (n)	0.5	µg/L	na	< 0.5	< 25	< 25	< 25
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 250	< 250	< 250
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 250	< 250	< 250
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 10	< 10	< 10
Methylene Chloride	0.5	µg/L	na	< 0.5	< 25	< 25	< 25
Styrene	0.2	µg/L	4	< 0.2	< 10[1]	< 10[1]	< 10[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 10	< 10	< 10
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 10	< 10	< 10
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 5	< 5	< 5
Toluene	0.2	µg/L	0.8	< 0.2	< 10[1]	< 10[1]	< 10[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 5	< 5	< 5
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 10	< 10	< 10
Trichloroethylene	0.1	µg/L	20	0.16	< 5	< 5	< 5
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 10	< 10	< 10
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 5	< 5	< 5
Xylenes, o-	0.1	µg/L	40	< 0.1	< 5	< 5	< 5
Xylenes	0.1	µg/L	72	< 0.1	< 5	< 5	< 5
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 10	< 10	< 10
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 10	< 10	< 10

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µg/L – micrograms per litre

BOLD Concentration greater than PWQO

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-108 UY9120 MW14-108-02202014 2014/02/20	MW14-108 YF6615 MW14-108-10282014 2014/10/28	MW14-108B YF6616 MW14-108B-10282014 2014/10/28
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.11	2.9	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.26	< 0.1	0.18
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.88	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	28	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	0.26	***2.3***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.25	3.4	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	1.7	< 0.1
Xylenes	0.1	µg/L	72	0.25	5	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-109 BAW120 MW14-109-09242015 2015/09/24	MW14-109 YF6671 MW14-109-10272014 2014/10/27	MW14-110 UY9122 MW14-110-02202014 2014/02/20	MW14-110 YF6617 MW14-110-10282014 2014/10/28
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 10	< 50
Benzene	0.1	µg/L	100	0.11	< 0.1	0.12	8.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.5
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 1
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 2.5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.5
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	< 0.5
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	0.85	< 0.5
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 1
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	< 1
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 1
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 2.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.35	0.17	0.16	< 0.5
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 1
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.5
Dichloroethylene, cis-1,2-	0.1	µg/L	na	8	5.9	< 0.1	< 0.5
Dichloroethylene, trans-1,2-	0.1	µg/L	na	0.86	0.45	< 0.1	< 0.5
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.5
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28	< 1.4
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	1.9
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 2.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 25
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 25
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 1
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 2.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 1
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 0.2	< 1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 1
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.5
Toluene	0.2	µg/L	0.8	0.22	0.22	< 0.2	***20***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.5
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 1
Trichloroethylene	0.1	µg/L	20	0.31	0.18	< 0.1	< 0.5
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 1
Xylenes, m+p-	0.1	µg/L	32	0.1	0.1	< 0.1	18
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	0.13	6.7
Xylenes	0.1	µg/L	72	0.1	0.1	0.13	24
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 1

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Field Screen - organic vapour meter reading
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ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-110B UY9121 MW14-110B-02202014 2014/02/20	MW14-110B YF6618 MW14-110B-10282014 2014/10/28	MW14-111 UY9118 MW14-111-02202014 2014/02/20
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	14	< 10	< 10
Benzene	0.1	µg/L	100	2.6	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	0.19	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.12	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	1.6	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	0.56	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***5***	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	1.6	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	7	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	8.5	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-111	MW14-112	MW14-112	MW14-113
	Laboratory Sample ID			YF6650	UY9117	YF6651	BAW143
	Sample Location			MW14-111-10292014	MW14-112-02202014	MW14-112-10292014	MW14-113-09222015
	Sampling Date (yyyy/mm/dd)			2014/10/29	2014/02/20	2014/10/29	2015/09/22
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.1	0.11
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1	4.9
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	***41***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2	1.5
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	3.9
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	0.37	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	0.11	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	0.11	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-113 UY9115 MW14-113-02202014 2014/02/20	MW14-113 YF6653 MW14-113-10292014 2014/10/29	MW14-113B BAW164 MW14-113B-09222015 2015/09/22
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 200	< 100
Benzene	0.1	µg/L	100	< 0.1	< 2	16
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 2	< 1
Bromoform	0.2	µg/L	60	< 0.2	< 4	< 2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 10[1]	< 5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 2	< 1
Chlorobenzene	0.1	µg/L	15	< 0.1	4.9	***38***
Chloroform	0.1	µg/L	na	< 0.1	< 2	< 1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 4	< 2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	***18***	***270***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 4[1]	***9.5***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 4	***25***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 10	< 5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 2	< 1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 4	< 2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 2	< 1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 2	< 1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 2	< 1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 2	< 1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 5.7	< 2.8
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 4	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 4	< 2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 2	1.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 4	< 2
Hexane (n)	0.5	µg/L	na	< 0.5	< 10	< 5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 100	< 50
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 100	< 50
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 4	< 2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 10	< 5
Styrene	0.2	µg/L	4	< 0.2	< 4	< 2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 4	< 1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 4	< 2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 2	< 1
Toluene	0.2	µg/L	0.8	< 0.2	< 4[1]	***5.4***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 2	< 1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 4	< 2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 2	< 1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 4	< 2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 4	< 2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 2	4.3
Xylenes, o-	0.1	µg/L	40	< 0.1	< 2	1.3
Xylenes	0.1	µg/L	72	< 0.1	< 2	5.6
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 4	< 2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 4	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 4	< 2

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-113B UY9116 MW14-113B-02202014 2014/02/20	MW14-113B YF6652 MW14-113B-10292014 2014/10/29	MW14-114 BAW159 MW14-114-09222015 2015/09/22
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	130	< 100	< 10
Benzene	0.1	µg/L	100	42	63	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.5	< 1	< 0.1
Bromoform	0.2	µg/L	60	< 1	< 2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 2.5[1]	< 5[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.5	< 1	< 0.1
Chlorobenzene	0.1	µg/L	15	6.3	7.2	< 0.1
Chloroform	0.1	µg/L	na	< 0.5	< 1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 1	< 2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***7***	***19***	0.47
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 1	< 2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 1	< 2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 2.5	< 5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.5	< 1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 1	< 2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.5	< 1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.5	< 1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.5	< 1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.5	< 1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 1.4	< 2.8	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 2	< 0.2
Ethylbenzene	0.1	µg/L	8	1.9	1.5	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 1	< 2	< 0.2
Hexane (n)	0.5	µg/L	na	6.9	< 5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 25	< 50	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 25	< 50	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 1	< 2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 2.5	< 5	< 0.5
Styrene	0.2	µg/L	4	< 1	< 2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 2	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 1	< 2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.5	< 1	< 0.1
Toluene	0.2	µg/L	0.8	***35***	***25***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.5	< 1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 1	< 2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.5	< 1	2.1
Trichlorofluoromethane	0.2	µg/L	na	< 1	< 2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 1	< 2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	1.3	6.4	< 0.1
Xylenes, o-	0.1	µg/L	40	8.9	2.1	< 0.1
Xylenes	0.1	µg/L	72	10	8.5	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 1	< 2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 2	< 0.2

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Laboratory analysis by
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< - Denotes concentration less than indicated detection limit
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Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-114 YN5741 MW14-114-11192014 2014/11/19	MW14-114B YN5714 MW14-114B-11182014 2014/11/18	MW14-115 BAW140 MW14-115-09222015 2015/09/22
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 100
Benzene	0.1	µg/L	100	0.13	0.56	< 1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	4.9
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	0.68	***140***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	***6.4***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	***15***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 2.8
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.2	< 1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 50
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 50
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 2[1]
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 2
Trichloroethylene	0.1	µg/L	20	4.2	0.63	< 1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	0.24	< 1
Xylenes, o-	0.1	µg/L	40	< 0.1	3.4	< 1
Xylenes	0.1	µg/L	72	< 0.1	3.7	< 1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 2

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BOLD Concentration greater than PWQO

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Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 100	< 50	< 10
Benzene	0.1	µg/L	100	< 1	0.96	0.63
Bromodichloromethane	0.1	µg/L	200	< 1	< 0.5	< 0.1
Bromoform	0.2	µg/L	60	< 2	< 1	< 0.2
Bromomethane	0.5	µg/L	0.9	< 5[1]	< 2.5[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 1	< 0.5	< 0.1
Chlorobenzene	0.1	µg/L	15	4.8	***18***	2.1
Chloroform	0.1	µg/L	na	< 1	< 0.5	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 2	< 1	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***120***	***130***	***24***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***5.1***	***21***	***5.1***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***12***	***46***	***11***
Dichlorodifluoromethane	0.5	µg/L	na	< 5	< 2.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 1	< 0.5	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 2	< 1	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 1	< 0.5	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 1	< 0.5	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 1	< 0.5	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 1	< 0.5	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 2.8	< 1.4	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 1	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 1	< 0.2
Ethylbenzene	0.1	µg/L	8	< 1	< 0.5	0.15
Ethylene Dibromide	0.2	µg/L	na	< 2	< 1	< 0.2
Hexane (n)	0.5	µg/L	na	< 5	< 2.5	0.68
Methyl Ethyl Ketone	5	µg/L	400	< 50	< 25	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 50	< 25	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 2	< 1	< 0.2
Methylene Chloride	0.5	µg/L	na	< 5	< 2.5	< 0.5
Styrene	0.2	µg/L	4	< 2	< 1	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 0.5	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 2	< 1	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 1	< 0.5	< 0.1
Toluene	0.2	µg/L	0.8	< 2[1]	***1.4***	***0.93***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 1	< 0.5	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 2	< 1	< 0.2
Trichloroethylene	0.1	µg/L	20	< 1	< 0.5	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 2	< 1	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 2	< 1	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 1	0.57	0.73
Xylenes, o-	0.1	µg/L	40	< 1	0.56	0.42
Xylenes	0.1	µg/L	72	< 1	1.1	1.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 2	< 1	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 1	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 1	< 0.2

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Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-115B BDJ134 MW 14-115 B-10062015 2015/10/06	MW14-115B YN5716 MW14-115B-11182014 2014/11/18	MW14-116 BAW142 MW14-116-09222015 2015/09/22
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 20	< 10	< 10
Benzene	0.1	µg/L	100	< 0.2	2.9	0.39
Bromodichloromethane	0.1	µg/L	200	< 0.2	1.8	< 0.1
Bromoform	0.2	µg/L	60	< 0.4	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 1[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.2	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.2	1.7	0.12
Chloroform	0.1	µg/L	na	< 0.2	19	0.18
Dibromochloromethane	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.4	***25***	***2.8***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.4	0.97	0.3
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.4	2.3	0.59
Dichlorodifluoromethane	0.5	µg/L	na	< 1	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.2	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.4	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.2	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.2	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.2	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.2	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.57	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.2	1.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 1	< 0.5	0.57
Methyl Ethyl Ketone	5	µg/L	400	< 10	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 10	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.4	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 1	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.4	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.4	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.4	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.2	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.4	***8.9***	0.46
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.2	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.4	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.2	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.4	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.2	1.6	0.44
Xylenes, o-	0.1	µg/L	40	< 0.2	4.6	0.13
Xylenes	0.1	µg/L	72	< 0.2	6.2	0.57
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.4	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.4	< 0.2	< 0.2

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	SNC-Lavalin Sample ID		PWQO[2]	MW14-116	MW14-116B	MW14-116B
	Laboratory Sample ID			YN5733	BDJ135	YN5715
	Sample Location			MW14-116-11192014	MW 14-116 B-10062015	MW14-116B-11182014
	Sampling Date (yyyy/mm/dd)			2014/11/19	2015/10/06	2014/11/18
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	72	< 1,000
Benzene	0.1	µg/L	100	0.12	16	100
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 10
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 20
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 50[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 10
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 10
Chloroform	0.1	µg/L	na	< 0.1	0.18	< 10
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 20
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	1.4	0.44	< 20[1]
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	0.44	< 0.2	< 20[1]
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	0.81	< 0.2	< 20[1]
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 50
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 10
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 20
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 10
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 10
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 10
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 10
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 28[1]
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 20
Ethylbenzene	0.1	µg/L	8	< 0.1	0.91	< 10[1]
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 20
Hexane (n)	0.5	µg/L	na	< 0.5	3.1	< 50
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 500[1]
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 500
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 20
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 50
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 20[1]
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.2	< 10
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 20
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 10
Toluene	0.2	µg/L	0.8	< 0.2	***30***	***180***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 10
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 20
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 10
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 20
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 20
Xylenes, m+p-	0.1	µg/L	32	0.11	4.6	***40***
Xylenes, o-	0.1	µg/L	40	0.21	11	15
Xylenes	0.1	µg/L	72	0.32	16	56
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 20
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 20
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 20

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-117B	MW14-118	MW14-118	MW14-118
	Laboratory Sample ID			YF6654	UY9112	UY9123	YF6655
	Sample Location			MW14-117B-10292014	MW14-118-02202014	MW-99-02202014	MW14-118-10292014
	Sampling Date (yyyy/mm/dd)			2014/10/29	2014/02/20	2014/02/20 Duplicate of MW14-118	2014/10/29
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	38	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.2	< 0.1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	0.36	0.42	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	***5***	***5.9***	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	1.5	1.7	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	3	3.7	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	0.16	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	7.3	< 5	< 5	8
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	0.16	< 0.1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	0.16	< 0.1	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
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Field Screen - organic vapour meter reading
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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-118	MW14-119	MW14-119	MW14-120
	Laboratory Sample ID			YF6666	UY9113	YN5730	BAW137
	Sample Location			MW-97-10292014	MW14-119-02202014	MW14-119-11192014	MW14-120-09222015
	Sampling Date (yyyy/mm/dd)			2014/10/29	2014/02/20	2014/11/19	2015/09/22
				Duplicate of MW14-118			
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 50	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.5	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.5	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 1	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 2.5[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.5	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	6.5	1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.5	0.17
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	***230***	***35***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	***28***	***4.6***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	***54***	***9.2***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 2.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.5	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 1	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.5	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.5	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.5	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.5	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 1.4	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.5	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 2.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 25	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 25	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 1	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 2.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 1	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.5	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 1	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.5	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 1[1]	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.5	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 1	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.5	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 1	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.1	< 0.5	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	< 0.5	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	< 0.1	< 0.5	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 1	< 0.2

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[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-120 UY9125 MW14-120-02212014 2014/02/21	MW14-120 YN5732 MW14-120-11192014 2014/11/19	MW14-121 BAW138 MW14-121-09222015 2015/09/22	MW14-121 UY9114 MW14-121-02202014 2014/02/20
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 100	< 10	11
Benzene	0.1	µg/L	100	< 0.1	< 1	0.29	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 5[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	0.41	2.3	5.3	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.66	***330***	***160***	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***5.7***	***41***	***12***	***3.3***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***6.7***	***73***	***27***	***9.2***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 2.8	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 50	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 50	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 1	< 0.1	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 2[1]	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.19	< 1	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	< 1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	0.19	< 1	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
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Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-121 YN5742 MW14-121-11192014 2014/11/19	MW14-122B BAW161 MW14-122B-09242015 2015/09/24	MW14-122B YN5708 MW14-122B-11182014 2014/11/18
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 1,000	< 100	< 10
Benzene	0.1	µg/L	100	< 10	***110***	58
Bromodichloromethane	0.1	µg/L	200	< 10	< 1	2.3
Bromoform	0.2	µg/L	60	< 20	< 2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 50[1]	< 5[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 10	< 1	< 0.1
Chlorobenzene	0.1	µg/L	15	***32***	< 1	< 0.1
Chloroform	0.1	µg/L	na	< 10	2.4	24
Dibromochloromethane	0.2	µg/L	na	< 20	< 2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***1,800***	< 2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***110***	< 2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***200***	< 2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 50	< 5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 10	< 1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 20	< 2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 10	< 1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 10	< 1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 10	< 1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 10	< 1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 28[1]	< 2.8	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 10[1]	2.6	3
Ethylene Dibromide	0.2	µg/L	na	< 20	< 2	< 0.2
Hexane (n)	0.5	µg/L	na	< 50	< 5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 500[1]	< 50	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 500	< 50	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 20	< 2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 50	< 5	< 0.5
Styrene	0.2	µg/L	4	< 20[1]	< 2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 10	< 1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 20	< 2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 10	< 1	< 0.1
Toluene	0.2	µg/L	0.8	< 20[1]	***130***	***12***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 10	< 1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 20	< 2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 10	< 1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 20	< 2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 20	< 2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 10	26	< 0.1
Xylenes, o-	0.1	µg/L	40	< 10	11	13
Xylenes	0.1	µg/L	72	< 10	37	13
Dibromoethane, 1,2-	0.2	µg/L	na	< 20	< 2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 20	< 2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 20	< 2	< 0.2

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-123B	MW14-123B	MW14-124B
	Laboratory Sample ID			BAW162	YN5709	BAW163
	Sample Location			MW14-123B-09242015	MW14-123B-11182014	MW14-124B-09242015
	Sampling Date (yyyy/mm/dd)			2015/09/24	2014/11/18	2015/09/24
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 100	< 1,000	< 10
Benzene	0.1	µg/L	100	59	19	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 1	< 10	< 0.1
Bromoform	0.2	µg/L	60	< 2	< 20	< 0.2
Bromomethane	0.5	µg/L	0.9	< 5[1]	< 50[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 1	< 10	< 0.1
Chlorobenzene	0.1	µg/L	15	< 1	< 10	< 0.1
Chloroform	0.1	µg/L	na	1.7	< 10	3.8
Dibromochloromethane	0.2	µg/L	na	< 2	< 20	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 2	< 20[1]	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 2	< 20[1]	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 2	< 20[1]	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 5	< 50	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 1	< 10	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 2	< 20	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 1	< 10	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 1	< 10	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 1	< 10	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 1	< 10	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 2.8	< 28[1]	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 20	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 20	< 0.2
Ethylbenzene	0.1	µg/L	8	2.4	< 10[1]	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 2	< 20	< 0.2
Hexane (n)	0.5	µg/L	na	< 5	< 50	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 50	< 500[1]	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 50	< 500	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 2	< 20	< 0.2
Methylene Chloride	0.5	µg/L	na	< 5	< 50	< 0.5
Styrene	0.2	µg/L	4	< 2	< 20[1]	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 10	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 2	< 20	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 1	< 10	< 0.1
Toluene	0.2	µg/L	0.8	***140***	***170***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 1	< 10	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 2	< 20	< 0.2
Trichloroethylene	0.1	µg/L	20	< 1	< 10	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 2	< 20	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 2	< 20	< 0.2
Xylenes, m+p-	0.1	µg/L	32	24	23	0.12
Xylenes, o-	0.1	µg/L	40	7.2	< 10	< 0.1
Xylenes	0.1	µg/L	72	32	23	0.12
Dibromoethane, 1,2-	0.2	µg/L	na	< 2	< 20	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 20	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 20	< 0.2

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-124B	MW14-127	MW14-127
	Laboratory Sample ID			YN5710	BAW134	YN5727
	Sample Location			MW14-124B-11182014	MW14-127-09232015	MW14-127-11192014
	Sampling Date (yyyy/mm/dd)			2014/11/18	2015/09/23	2014/11/19
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 1,000	< 10
Benzene	0.1	µg/L	100	1.6	***15,000***	29
Bromodichloromethane	0.1	µg/L	200	1.3	< 10	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 20	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 50[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 10	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	***140,000***	***420***
Chloroform	0.1	µg/L	na	22	< 10	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 20	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.55	***2,500,000***	***1,300***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	***1,100,000***	***360***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***1,400,000***	***670***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 50	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 10	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	***870***	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 10	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	32	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	26	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 10	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 28[1]	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 20	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 20	< 0.2
Ethylbenzene	0.1	µg/L	8	0.95	***69***	0.25
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 20	< 0.2
Hexane (n)	0.5	µg/L	na	0.98	< 50	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 500[1]	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 500	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 20	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 50	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 20[1]	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 10	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 20	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 10	< 0.1
Toluene	0.2	µg/L	0.8	***5.9***	***200***	***0.99***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 10	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 20	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 10	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 20	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 20	< 0.2
Xylenes, m+p-	0.1	µg/L	32	6.9	***140***	0.95
Xylenes, o-	0.1	µg/L	40	3.6	***63***	0.35
Xylenes	0.1	µg/L	72	11	***210***	1.3
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 20	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 20	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 20	< 0.2

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-127	MW14-128B	MW14-128B
	Laboratory Sample ID			YN5728	BAW166	BAW167
	Sample Location			MW14-1127-11192014	MW14-128B-09232015	MW14-1128B-09232015
	Sampling Date (yyyy/mm/dd)			2014/11/19	2015/09/23	2015/09/23
				Duplicate of		Duplicate of
Parameter	**RDL**	**Units**		MW14-127		MW14-128B
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	27	0.91	0.33
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	***420***	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***1,400***	0.27	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***390***	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***730***	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.16	0.14
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	0.67	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***0.96***	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.94	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	0.36	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	1.3	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-128B YN5711 MW14-128B-11182014 2014/11/18	MW14-129B YN5712 MW14-129B-11182014 2014/11/18	MW14-130 BAW160 MW14-130-09222015 2015/09/22
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	26	3.7	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	2.6	1.4	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***2.7***	***2.8***	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	2.1	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***5.3***	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	1.6	0.53	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	***46***	***3.8***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	4.7	0.25	< 0.1
Xylenes, o-	0.1	µg/L	40	15	2.3	< 0.1
Xylenes	0.1	µg/L	72	20	2.6	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW14-130 YN5743 MW14-130-11192014 2014/11/19	MW14-130B BAW165 MW14-130B-09242015 2015/09/24	MW14-130B YN5713 MW14-130B-11182014 2014/11/18
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	0.15	0.43	2.5
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	0.13	2.8
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	***3.1***	***54***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	0.49	***4.4***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	1.2	***11***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	0.24
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	6.4	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	0.27	0.25	***4.8***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.21	0.22	0.79
Xylenes, o-	0.1	µg/L	40	< 0.1	0.16	6.4
Xylenes	0.1	µg/L	72	0.21	0.38	7.2
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-131	MW14-131	MW15-141	MW15-143
	Laboratory Sample ID			BAW121	YN5726	BGU128	BGU096
	Sample Location			MW14-131-09242015	MW14-131-11182014	MW15-141-10302015	MW15-143-10282015
	Sampling Date (yyyy/mm/dd)			2015/09/24	2014/11/18	2015/10/30	2015/10/28
Parameter	**RDL**	**Units**					
Volatile Organic Compounds							
Acetone	10	µg/L	na	< 10	< 10	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	0.11	0.54	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	0.93	1.9	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	0.41	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	0.42	0.79	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	1.5	3.5	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	0.27	0.4	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.1	< 0.1	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	2.3	0.17
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	0.12	0.19	0.24	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	0.12	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	0.12	0.32	0.24	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
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BOLD Concentration greater than PWQO

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW15-144	MW15-145	MW15-145
	Laboratory Sample ID			BGU161	BGU125	BGU126
	Sample Location			MW15-144-10292015	MW15-145-10302015	MW15-1145-10302015
	Sampling Date (yyyy/mm/dd)			2015/10/29	2015/10/30	2015/10/30
						Duplicate of
Parameter	RDL	Units				MW15-145
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	0.15	0.15
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	0.22	0.23
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	0.23	0.23
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	0.23	0.21
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	0.23	0.21
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-146 BGU127 MW15-146-10302015 2015/10/30	MW15-147A BGU095 MW15-147A-10282015 2015/10/28	MW15-148A BGU162 MW15-148A-10292015 2015/10/29
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	3.2	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	0.5	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	0.38	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	< 0.1	0.42
Xylenes	0.1	µg/L	72	< 0.1	< 0.1	0.42
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
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Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW15-148A	MW15-149A	MW15-150A
	Laboratory Sample ID			BGU163	BGU164	BGU165
	Sample Location			MW15-1148A-10292015	MW15-149A-10292015	MW15-150A-10292015
	Sampling Date (yyyy/mm/dd)			2015/10/29	2015/10/29	2015/10/29
				Duplicate of MW15-148A		
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	110	310
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	0.19	0.33
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	***6.8***	***19***
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	1.9	***2.7***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***4.8***	***7.4***
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	0.45	0.56	1.4
Xylenes	0.1	µg/L	72	0.45	0.56	1.4
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
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[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-151 BGU160 MW15-151-10292015 2015/10/29	MW15-152 BGU158 MW15-152-10292015 2015/10/29	MW15-152 BGU159 MW15-1152-10292015 2015/10/29 Duplicate of MW15-152
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 100	< 10	< 10
Benzene	0.1	µg/L	100	< 1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 5[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	***18***	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 1	0.17	0.16
Dibromochloromethane	0.2	µg/L	na	< 2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	***170***	0.5	0.51
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	***6.7***	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	***19***	0.23	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 2.8	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 50	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 50	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 1	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 2[1]	< 0.2	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 1	< 0.1	< 0.1
Xylenes, o-	0.1	µg/L	40	< 1	< 0.1	< 0.1
Xylenes	0.1	µg/L	72	< 1	< 0.1	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 2	< 0.2	< 0.2

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-152B BGU129 MW15-152B-10302015 2015/10/30	MW15-153 BGU102 MW15-153-10292015 2015/10/29	MW15-153B BGU130 MW15-153B-10302015 2015/10/30
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	130	< 10	130
Benzene	0.1	µg/L	100	< 0.5	< 0.1	2.8
Bromodichloromethane	0.1	µg/L	200	< 0.5	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 1	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 2.5[1]	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.5	< 0.1	0.34
Chloroform	0.1	µg/L	na	< 0.5	0.89	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 1	0.67	0.82
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 1	< 0.2	***2.6***
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 1	< 0.2	***6.1***
Dichlorodifluoromethane	0.5	µg/L	na	< 2.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.5	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 1	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.5	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.5	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 1.4	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.5	< 0.1	0.18
Ethylene Dibromide	0.2	µg/L	na	< 1	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 2.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 25	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 25	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 1	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 2.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 1	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 1	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	0.66	< 0.1	< 0.1
Toluene	0.2	µg/L	0.8	< 1[1]	0.2	***4.4***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.5	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 1	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.5	0.25	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 1	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 1	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.5	0.17	1.6
Xylenes, o-	0.1	µg/L	40	0.8	0.17	4.7
Xylenes	0.1	µg/L	72	0.8	0.33	6.3
Dibromoethane, 1,2-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

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TABLE C.2:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)			PWQO[2]	MW15-154 BGU101 MW15-154-10292015 2015/10/29	MW15-154B BGU131 MW15-154B-10302015 2015/10/30	MW15-156 BGU097 MW15-156-10282015 2015/10/28
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	170	< 10
Benzene	0.1	µg/L	100	< 0.1	1.9	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.2	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.4	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 1[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	0.3	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	***3.4***	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	***8.3***	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 1	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.2	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.4	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.2	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.57	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.2	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 1	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 10	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 10	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.4	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 1	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.4	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.4	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.4	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.2	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	***2.9***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.2	0.14
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.4	< 0.2
Trichloroethylene	0.1	µg/L	20	0.68	0.26	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.4	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	0.76	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	2.2	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	3	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2

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Laboratory analysis by
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ppmv - parts per million by volume (relative to hexane)

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BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-156B BGU166 MW15-156B-10292015 2015/10/29	MW15-157 BGU098 MW15-157-10282015 2015/10/28	MW15-157B BGU167 MW15-157B-10292015 2015/10/29
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 15	< 10	< 10
Benzene	0.1	µg/L	100	< 0.1	< 0.1	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.2	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.1	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.1	< 0.1	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.2	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.1	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.1	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.28	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	< 0.1	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 5	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 5	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 0.5	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.2	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.2	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.1	0.68
Toluene	0.2	µg/L	0.8	0.29	< 0.2	0.29
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.1	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.2	< 0.2
Trichloroethylene	0.1	µg/L	20	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.2	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	< 0.1	0.12
Xylenes, o-	0.1	µg/L	40	0.93	< 0.1	0.25
Xylenes	0.1	µg/L	72	0.93	< 0.1	0.37
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.2	< 0.2

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ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-158 BGU099 MW15-158-10282015 2015/10/28	MW15-158B BIN690 MW15-158B-11092015 2015/11/09	MW15-159 BGU100 MW15-159-10282015 2015/10/28
Parameter	**RDL**	**Units**				
Volatile Organic Compounds						
Acetone	10	µg/L	na	< 10	110	< 10
Benzene	0.1	µg/L	100	< 0.1	1.5	< 0.1
Bromodichloromethane	0.1	µg/L	200	< 0.1	< 0.2	< 0.1
Bromoform	0.2	µg/L	60	< 0.2	< 0.4	< 0.2
Bromomethane	0.5	µg/L	0.9	< 0.5	< 1[1]	< 0.5
Carbon Tetrachloride	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Chlorobenzene	0.1	µg/L	15	< 0.1	< 0.2	< 0.1
Chloroform	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dibromochloromethane	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 0.2	< 0.4	< 0.2
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 0.2	< 0.4	< 0.2
Dichlorodifluoromethane	0.5	µg/L	na	< 0.5	< 1	< 0.5
Dichloroethane, 1,1-	0.1	µg/L	200	0.2	< 0.2	< 0.1
Dichloroethane, 1,2-	0.2	µg/L	100	< 0.2	< 0.4	< 0.2
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.1	< 0.2	< 0.1
Dichloroethylene, cis-1,2-	0.1	µg/L	na	0.83	< 0.2	0.1
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.1	< 0.2	< 0.1
Dichloropropene, 1,3-	0.28	µg/L	7	< 0.28	< 0.57	< 0.28
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Ethylbenzene	0.1	µg/L	8	< 0.1	0.44	< 0.1
Ethylene Dibromide	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Hexane (n)	0.5	µg/L	na	< 0.5	< 1	< 0.5
Methyl Ethyl Ketone	5	µg/L	400	< 5	< 10	< 5
Methyl Isobutyl Ketone	5	µg/L	600	< 5	< 10	< 5
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 0.2	< 0.4	< 0.2
Methylene Chloride	0.5	µg/L	na	< 0.5	< 1	< 0.5
Styrene	0.2	µg/L	4	< 0.2	< 0.4	< 0.2
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 0.2	< 0.4	< 0.2
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 0.2	< 0.4	< 0.2
Tetrachloroethylene	0.1	µg/L	50	< 0.1	< 0.2	< 0.1
Toluene	0.2	µg/L	0.8	< 0.2	***4***	< 0.2
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.1	< 0.2	< 0.1
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 0.2	< 0.4	< 0.2
Trichloroethylene	0.1	µg/L	20	0.13	< 0.2	< 0.1
Trichlorofluoromethane	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Vinyl Chloride	0.2	µg/L	600	< 0.2	< 0.4	< 0.2
Xylenes, m+p-	0.1	µg/L	32	< 0.1	3.4	< 0.1
Xylenes, o-	0.1	µg/L	40	< 0.1	1.7	< 0.1
Xylenes	0.1	µg/L	72	< 0.1	5	< 0.1
Dibromoethane, 1,2-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 0.2	< 0.4	< 0.2

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µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

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Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID Laboratory Sample ID Sample Location Sampling Date (yyyy/mm/dd)		PWQO[2]	MW15-159B BGU124 MW15-159B-10292015 2015/10/29
Parameter	**RDL**	**Units**		
Volatile Organic Compounds				
Acetone	10	µg/L	na	< 50
Benzene	0.1	µg/L	100	1
Bromodichloromethane	0.1	µg/L	200	< 0.5
Bromoform	0.2	µg/L	60	< 1
Bromomethane	0.5	µg/L	0.9	< 2.5[1]
Carbon Tetrachloride	0.1	µg/L	na	< 0.5
Chlorobenzene	0.1	µg/L	15	< 0.5
Chloroform	0.1	µg/L	na	< 0.5
Dibromochloromethane	0.2	µg/L	na	< 1
Dichlorobenzene, 1,2- (o-DCB)	0.2	µg/L	2.5	< 1
Dichlorobenzene, 1,3- (m-DCB)	0.2	µg/L	2.5	< 1
Dichlorobenzene, 1,4- (p-DCB)	0.2	µg/L	4	< 1
Dichlorodifluoromethane	0.5	µg/L	na	< 2.5
Dichloroethane, 1,1-	0.1	µg/L	200	< 0.5
Dichloroethane, 1,2-	0.2	µg/L	100	< 1
Dichloroethylene, 1,1-	0.1	µg/L	40	< 0.5
Dichloroethylene, cis-1,2-	0.1	µg/L	na	< 0.5
Dichloroethylene, trans-1,2-	0.1	µg/L	na	< 0.5
Dichloropropane, 1,2-	0.1	µg/L	na	< 0.5
Dichloropropene, 1,3-	0.28	µg/L	7	< 1.4
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1
Ethylbenzene	0.1	µg/L	8	< 0.5
Ethylene Dibromide	0.2	µg/L	na	< 1
Hexane (n)	0.5	µg/L	na	< 2.5
Methyl Ethyl Ketone	5	µg/L	400	< 25
Methyl Isobutyl Ketone	5	µg/L	600	< 25
Methyl t-butyl ether (MTBE)	0.2	µg/L	200	< 1
Methylene Chloride	0.5	µg/L	na	< 2.5
Styrene	0.2	µg/L	4	< 1
Tetrachloroethane, 1,1,1,2-	0.1	µg/L	20	< 1
Tetrachloroethane, 1,1,2,2-	0.2	µg/L	70	< 1
Tetrachloroethylene	0.1	µg/L	50	< 0.5
Toluene	0.2	µg/L	0.8	***1.3***
Trichloroethane, 1,1,1-	0.1	µg/L	10	< 0.5
Trichloroethane, 1,1,2-	0.2	µg/L	800	< 1
Trichloroethylene	0.1	µg/L	20	< 0.5
Trichlorofluoromethane	0.2	µg/L	na	< 1
Vinyl Chloride	0.2	µg/L	600	< 1
Xylenes, m+p-	0.1	µg/L	32	< 0.5
Xylenes, o-	0.1	µg/L	40	9.5
Xylenes	0.1	µg/L	72	9.5
Dibromoethane, 1,2-	0.2	µg/L	na	< 1
Dichloropropene, cis-1,3-	0.2	µg/L	na	< 1
Dichloropropene, trans-1,3-	0.2	µg/L	na	< 1

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[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-14	MW12-16	MW12-16
	Laboratory Sample ID			BDJ136	DH9507	ED3295
	Sample Location			MW 12-14-10072015	MW12-16-05012012	MW12-16-08022012
	Sampling Date (yyyy/mm/dd)			2015/10/07	2012/05/01	2012/08/02
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.01	< 0.15	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.01	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.01[1]	< 0.0085[1]	< 0.0085[1]
Benzo(a)pyrene	0.0075	µg/L	na	< 0.01	< 0.0075	< 0.0075
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.01	0.014	< 0.0085
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.01[1]	< 0.0085[1]	< 0.0085[1]
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.01[1]	< 0.0085[1]	< 0.0085[1]
Chrysene	0.0085	µg/L	0.0001	< 0.01[1]	< 0.0085[1]	< 0.0085[1]
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.01[1]	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	< 0.01[1]	***0.076***	< 0.04[1]
Fluorene	0.01	µg/L	0.2	< 0.01	< 0.46[1]	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.01	< 0.0085	< 0.0085
Methylnaphthalene, 1-	0.01	µg/L	2	< 0.01	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.01	0.4	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	< 0.01	0.24	< 0.1
Phenanthrene	0.01	µg/L	0.03	< 0.01	***2.1***	< 0.05[1]
Pyrene	0.01	µg/L	na	< 0.01	0.077	< 0.02
B(a)P TPE[3]	0.0100000000	µg/L	na	-	0.01	< 0.0100000000
Acridine	0.2	µg/L	na	-	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	-	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	-	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	-	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	-	< 0.2	< 0.2

All terms defined within the body of SNC-Lavalin's report.
Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-16	MW12-20	MW12-20
	Laboratory Sample ID			ED3296	DH9508	ED3303
	Sample Location			MW12-16-200-08022012	MW12-20-05012012	MW12-20-08022012
	Sampling Date (yyyy/mm/dd)			2012/08/02 Duplicate of MW12-16	2012/05/01	2012/08/02
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.0085[1]	***0.032***	< 0.0085[1]
Benzo(a)pyrene	0.0075	µg/L	na	< 0.0075	0.033	< 0.0075
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.0085	0.038	< 0.0085
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.0085[1]	***0.025***	< 0.0085[1]
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.0085[1]	***0.018***	< 0.0085[1]
Chrysene	0.0085	µg/L	0.0001	< 0.0085[1]	***0.035***	< 0.0085[1]
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.0075[1]	***0.011***	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	< 0.04[1]	***0.13***	< 0.04[1]
Fluorene	0.01	µg/L	0.2	< 0.05	< 0.28[1]	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.0085	0.023	< 0.0085
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.1	0.18	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	< 0.1	0.12	< 0.1
Phenanthrene	0.01	µg/L	0.03	< 0.05[1]	***1.7***	< 0.05[1]
Pyrene	0.01	µg/L	na	< 0.02	0.099	< 0.02
B(a)P TPE[3]	0.0100000000	µg/L	na	< 0.0100000000	0.055	< 0.0100000000
Acridine	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-20	MW12-65	MW12-65
	Laboratory Sample ID			DH9508_	DH5260	ED3304
	Sample Location			MW12-20-200-05012012	MW12-65-04252012	MW12-65-07312012
	Sampling Date (yyyy/mm/dd)			2012/05/01 Duplicate of MW12-20	2012/04/25	2012/07/31
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01! < 0.01[1]	< 0.01[1]	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	***0.028***	***0.013***	< 0.0085[1]
Benzo(a)pyrene	0.0075	µg/L	na	0.0250.025	0.011	< 0.0075
Benzo(b,j)fluoranthene	0.0085	µg/L	na	0.0360.036	0.017	< 0.0085
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	***0.023***	< 0.0085[1]	< 0.0085[1]
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	***0.012***	< 0.0085[1]	< 0.0085[1]
Chrysene	0.0085	µg/L	0.0001	***0.03***	***0.011***	< 0.0085[1]
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	***0.01***	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	***0.13***	***0.083***	< 0.04[1]
Fluorene	0.01	µg/L	0.2	< 0.29! < 0.29[1]	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	0.0210.021	< 0.0085	< 0.0085
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	0.170.17	< 0.1	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	0.120.12	< 0.1	0.91
Phenanthrene	0.01	µg/L	0.03	***1.8***	***0.76***	< 0.05[1]
Pyrene	0.01	µg/L	na	0.0990.099	0.05	< 0.02
B(a)P TPE[3]	0.0100000000	µg/L	na	0.0450.045	0.019	< 0.0100000000
Acridine	0.2	µg/L	na	< 0.2< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05! < 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2< 0.2	< 0.2	< 0.2

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Laboratory analysis by
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Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-77	MW12-77	MW12-77
	Laboratory Sample ID			ED3291	NG1938/DH5258	NG1939/DH5259
	Sample Location			MW12-77-08022012	MW12-77-04252012	MW12-77-200-04252012
	Sampling Date (yyyy/mm/dd)			2012/08/02	2012/04/25	2012/04/25 Duplicate of MW12-77
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.0085[1]	***0.017***	***0.023***
Benzo(a)pyrene	0.0075	µg/L	na	< 0.0075	0.017	0.021
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.0085	0.026	0.027
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.0085[1]	***0.0098***	***0.014***
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.0085[1]	< 0.0085[1]	***0.012***
Chrysene	0.0085	µg/L	0.0001	< 0.0085[1]	***0.017***	***0.021***
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.0075[1]	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	< 0.04[1]	***0.087***	***0.1***
Fluorene	0.01	µg/L	0.2	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.0085	< 0.0085	0.011
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.1	< 0.1	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	0.11	< 0.1	< 0.1
Phenanthrene	0.01	µg/L	0.03	< 0.05[1]	***0.59***	***0.57***
Pyrene	0.01	µg/L	na	< 0.02	0.069	0.085
B(a)P TPE[3]	0.0100000000	µg/L	na	< 0.0100000000	0.026	0.032
Acridine	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
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< - Denotes concentration less than indicated detection limit
"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-79	MW12-79	MW12-82
	Laboratory Sample ID			DH5257	ED3292	DH5256
	Sample Location			MW12-79-04252012	MW12-79-08022012	MW12-82-04242012
	Sampling Date (yyyy/mm/dd)			2012/04/25	2012/08/02	2012/04/24
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	***0.022***
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.0085[1]	< 0.0085[1]	***0.033***
Benzo(a)pyrene	0.0075	µg/L	na	< 0.0075	< 0.0075	0.025
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.0085	< 0.0085	0.036
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.0085[1]	< 0.0085[1]	***0.014***
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.0085[1]	< 0.0085[1]	***0.014***
Chrysene	0.0085	µg/L	0.0001	< 0.0085[1]	< 0.0085[1]	***0.026***
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.0075[1]	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	***0.043***	< 0.04[1]	***0.1***
Fluorene	0.01	µg/L	0.2	< 0.05	< 0.05	< 0.057
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.0085	< 0.0085	0.012
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.1	< 0.1	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	< 0.1	< 0.1	< 0.1
Phenanthrene	0.01	µg/L	0.03	***0.36***	< 0.05[1]	***0.38***
Pyrene	0.01	µg/L	na	0.027	< 0.02	0.08
B(a)P TPE[3]	0.0100000000	µg/L	na	< 0.0100000000	< 0.0100000000	0.039
Acridine	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2	< 0.2	< 0.2

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Laboratory analysis by
RDL - Reportable Detection Limit, unless otherwise noted
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"-" - Not analyzed
na - Not applicable
Field Screen - organic vapour meter reading
mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-82	MW12-84	MW12-86
	Laboratory Sample ID			ED3305	DH5255	DH5254
	Sample Location			MW12-82-07312012	MW12-84-04232012	MW12-86-04232012
	Sampling Date (yyyy/mm/dd)			2012/07/31	2012/04/23	2012/04/23
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.0085[1]	< 0.0085[1]	***0.02***
Benzo(a)pyrene	0.0075	µg/L	na	< 0.0075	< 0.0075	0.014
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.0085	< 0.0085	0.021
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.0085[1]	< 0.0085[1]	< 0.0085[1]
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.0085[1]	< 0.0085[1]	< 0.0085[1]
Chrysene	0.0085	µg/L	0.0001	< 0.0085[1]	< 0.0085[1]	***0.015***
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.0075[1]	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	< 0.04[1]	< 0.04[1]	***0.068***
Fluorene	0.01	µg/L	0.2	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.0085	< 0.0085	< 0.0085
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.1	< 0.1	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	1.4	< 0.1	< 0.1
Phenanthrene	0.01	µg/L	0.03	< 0.05[1]	***0.2***	***0.34***
Pyrene	0.01	µg/L	na	< 0.02	< 0.02	0.049
B(a)P TPE[3]	0.0100000000	µg/L	na	< 0.0100000000	< 0.0100000000	0.023
Acridine	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2	< 0.2	< 0.2

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mbgs - meter below ground surface
Conversion factor of 1% LEL = 110 ppmv applied
ppmv - parts per million by volume (relative to hexane)

µg/L – micrograms per litre

BOLD Concentration greater than PWQO

[1] Laboratory detection limit exceeds regulatory standard/guideline.

[2] Provincial Water Quality Objectives (PWQO, 1994). Where PWQO is hardness dependent, hardness of receiving water assumed to be >100 mg/L.

[3] Benzo[a]pyrene Total Potency Equivalents (BaP TPE), is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF) (CCME, 2010), then summing the potency equivalents to determine the BaP TPE for the sample. Incremental lifetime cancer risk of 10^-5.

[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW12-86	MW12-89	MW12-89
	Laboratory Sample ID			ED3302	DH5242	ED3297
	Sample Location			MW12-86-08022012	MW12-89-04232012	MW12-89-08022012
	Sampling Date (yyyy/mm/dd)			2012/08/02	2012/04/23	2012/08/02
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.01	µg/L	na	< 0.1	< 0.1	< 0.1
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	***0.036***	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.0085[1]	***0.035***	< 0.0085[1]
Benzo(a)pyrene	0.0075	µg/L	na	< 0.0075	0.021	< 0.0075
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.0085	0.029	< 0.0085
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.0085[1]	***0.01***	< 0.0085[1]
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.0085[1]	***0.012***	< 0.0085[1]
Chrysene	0.0085	µg/L	0.0001	< 0.0085[1]	***0.027***	< 0.0085[1]
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.0075[1]	< 0.0075[1]	< 0.0075[1]
Fluoranthene	0.01	µg/L	0.0008	< 0.04[1]	***0.15***	< 0.04[1]
Fluorene	0.01	µg/L	0.2	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.0085	0.0095	< 0.0085
Methylnaphthalene, 1-	0.01	µg/L	2	-	-	-
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.1	< 0.1	< 0.1
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	-	-	-
Naphthalene	0.01	µg/L	7	< 0.1	< 0.1	< 0.1
Phenanthrene	0.01	µg/L	0.03	< 0.05[1]	***0.34***	< 0.05[1]
Pyrene	0.01	µg/L	na	< 0.02	0.11	< 0.02
B(a)P TPE[3]	0.0100000000	µg/L	na	< 0.0100000000	0.033	< 0.0100000000
Acridine	0.2	µg/L	na	< 0.2	< 0.2	< 0.2
Benzo(c)phenanthrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Benzo(e)pyrene	0.05	µg/L	na	< 0.05	< 0.05	< 0.05
Perylene	0.05	µg/L	0.00007	< 0.05[1]	< 0.05[1]	< 0.05[1]
Quinoline	0.2	µg/L	10	< 0.2	< 0.2	< 0.2

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µg/L – micrograms per litre

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TABLE C.3:
Groundwater Analytical Results
Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		PWQO[2]	MW14-106	MW14-106	MW14-106
	Laboratory Sample ID			BAW118	BAW119	VA3462
	Sample Location			MW14-106-09232015	MW14-1106-09232015	MW14-106-02242014
	Sampling Date (yyyy/mm/dd)			2015/09/23	2015/09/23 Duplicate of MW14-106	2014/02/24
Parameter	**RDL**	**Units**				
PAHs						
Acenaphthene	0.01	µg/L	na	< 0.01	< 0.01	0.025
Acenaphthylene	0.01	µg/L	na	< 0.01	< 0.01	< 0.01
Anthracene	0.01	µg/L	0.0008	< 0.01[1]	< 0.01[1]	***0.019***
Benzo(a)anthracene	0.0085	µg/L	0.0004	< 0.01[1]	< 0.01[1]	***0.023***
Benzo(a)pyrene	0.0075	µg/L	na	< 0.01	< 0.01	0.016
Benzo(b,j)fluoranthene	0.0085	µg/L	na	< 0.01	< 0.01	0.022
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	< 0.01[1]	< 0.01[1]	***0.01***
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	< 0.01[1]	< 0.01[1]	< 0.01[1]
Chrysene	0.0085	µg/L	0.0001	< 0.01[1]	< 0.01[1]	***0.026***
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.01[1]	< 0.01[1]	< 0.01[1]
Fluoranthene	0.01	µg/L	0.0008	***0.022***	***0.018***	***0.083***
Fluorene	0.01	µg/L	0.2	< 0.01	< 0.01	0.02
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	< 0.01	< 0.01	< 0.01
Methylnaphthalene, 1-	0.01	µg/L	2	< 0.01	< 0.01	0.015
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.01	< 0.01	0.026
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	< 0.014	< 0.014	-
Naphthalene	0.01	µg/L	7	< 0.01	< 0.01	0.082
Phenanthrene	0.01	µg/L	0.03	0.012	0.01	***0.094***
Pyrene	0.01	µg/L	na	0.017	0.013	0.059
B(a)P TPE[3]	0.0100000000	µg/L	na	-	-	-
Acridine	0.2	µg/L	na	-	-	-
Benzo(c)phenanthrene	0.05	µg/L	na	-	-	-
Benzo(e)pyrene	0.05	µg/L	na	-	-	-
Perylene	0.05	µg/L	0.00007	-	-	-
Quinoline	0.2	µg/L	10	-	-	-

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Detailed Site Investigation - Hangar 5 & 6 - 8 Wing CFB, Trenton, ON

	SNC-Lavalin Sample ID		**PWQO[2]**	**MW14-106**
	Laboratory Sample ID			YF6619
	Sample Location			MW14-106-10282014
	Sampling Date (yyyy/mm/dd)			2014/10/28
Parameter	**RDL**	**Units**		
PAHs				
Acenaphthene	0.01	µg/L	na	< 0.01
Acenaphthylene	0.01	µg/L	na	< 0.01
Anthracene	0.01	µg/L	0.0008	< 0.01[1]
Benzo(a)anthracene	0.0085	µg/L	0.0004	***0.023***
Benzo(a)pyrene	0.0075	µg/L	na	0.023
Benzo(b,j)fluoranthene	0.0085	µg/L	na	0.034
Benzo(g,h,i)perylene	0.0085	µg/L	0.00002	***0.015***
Benzo(k)fluoranthene	0.0085	µg/L	0.0002	***0.012***
Chrysene	0.0085	µg/L	0.0001	***0.026***
Dibenzo(a,h)anthracene	0.0075	µg/L	0.002	< 0.01[1]
Fluoranthene	0.01	µg/L	0.0008	***0.067***
Fluorene	0.01	µg/L	0.2	< 0.01
Indeno(1,2,3-cd)pyrene	0.0085	µg/L	na	0.014
Methylnaphthalene, 1-	0.01	µg/L	2	< 0.01
Methylnaphthalene, 2-	0.01	µg/L	2	< 0.01
Methylnaphthalene, 1- & 2-	0.014	µg/L	na	< 0.014
Naphthalene	0.01	µg/L	7	< 0.01
Phenanthrene	0.01	µg/L	0.03	***0.031***
Pyrene	0.01	µg/L	na	0.053
B(a)P TPE[3]	0.0100000000	µg/L	na	-
Acridine	0.2	µg/L	na	-
Benzo(c)phenanthrene	0.05	µg/L	na	-
Benzo(e)pyrene	0.05	µg/L	na	-
Perylene	0.05	µg/L	0.00007	-
Quinoline	0.2	µg/L	10	-

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[4] Both a PWQO and Interim PWQO exist. The more stringent should be applied where a greater level of aquatic protection is appropriate.

SITE PHOTOGRAPHS

Photograph 1: View from southeast edge of area to be excavated looking south at pedestrian bridge over Highway 2 and Building 65 (part of Hangar 7) beyond

Photograph 2: View from north edge of concrete pad (to be removed) of former Hangar 6 looking south at pedestrian bridge over Highway 2

SITE PHOTOGRAPHS

Photograph 3: View from northwest corner of concrete pad (to be removed) of former Hangar 6 looking southeast towards Highway 2

Photograph 4: View from middle of concrete pad (to be removed) of former Hangar 6 looking east towards new Hangar 6

SITE PHOTOGRAPHS

Photograph 5: View from east edge of area to be excavated looking west towards Building 65 (part of Hangar 7)

Photograph 6: View from southeast corner of concrete pad (to be removed) of former Hangar 6 looking north towards airfield (apron)

SITE PHOTOGRAPHS

Photograph 7: View from concrete apron (north of former Hangar 6) looking east towards new Hanger 6

Photograph 8: View from North Star Drive: southeast corner of area to be excavated, looking north towards airfield (apron). New Hangar 6 located on the east

SITE PHOTOGRAPHS

Photograph 9: View from south North Star Drive (west of pedestrian bridge), looking east at concrete pad of former Hangar 6 and new Hanger 6 beyond

Photograph 10: View from North Star Drive: southwest end of area to be excavated looking, west towards Building 65 (part of Hangar 7)

SITE PHOTOGRAPHS

Photograph 11: View from south end of North Star Drive, looking north. Building 65 (part of Hangar 7) to the west

Photograph 12: View from north end of apron (by monitoring well MW14-131), looking south west, Building 65 and Hangar 7 beyond

CONTAMINATED SOIL REMOVAL CONSTRUCTION CHECKLIST, DEPARTMENT OF NATIONAL DEFENCE, 8 WING CFB TRENTON, FORMER HANGAR 6, ASTRA, ONTARIO

This checklist outlines the requirements for contaminated soil removal and risk management measures under the R.082882.001 Specifications and is intended to be used as an on-site tool to ensure that the work is completed as per the tender specifications and design drawings prepared for the site.

Table 1: Remediation and Risk Management Construction Checklist

No.	Checklist Item	Completed Y/N	Comments
1	Locate underground utilities at the Site before initiating the ground disturbance activities. Verify electrical “HHH” lines as indicated on Drawing C-05 is de-energized prior to abandonment. Protect other utilities, infrastructure and monitoring wells identified on Drawing C-04. Establish access ramp for trucking route.		Known utility plans have been provided as part of tender package. Existing hydro service located within the northwest portion of the excavation, shall be de-energized by others prior to ground disturbance activities.
2	Submit an application for a DND Master Dig Permit 6 weeks in advance of anticipated construction start date.		Departmental Representative to provide copy of Master Dig permit once issued.
3	Decommission 22 existing monitoring wells as indicated on Drawing C-05.		Wells to be decommissioned in accordance with O.Reg.903.
4	Locate a licensed MOECC waste disposal facility that will accept the excavated contaminated soil (both hazardous and non-hazardous) prior to remediation activities.		TCLP results have been obtained and will be provided by the Departmental Representative. Proposed waste disposal facility must be approved by Departmental Representative.
5	Remove asphalt, existing concrete slab and pad to former Hangar 6 and portions of concrete apron (non-reinforced portions only) as indicated on Drawing C-05.		Segregate and dispose of asphalt and concrete off-site at a recycling facility.
6	Establish temporary stockpile management area as directed by Departmental Representative. Dimensions of stockpiles on-site must be limited to ~ 6 m x 6m x 4 m height.		
7	Establish access ramp and truck decontamination pad.		
8	Install dewatering system (incl. 66 well points).		Refer to Drawing C-08 for required sequencing of excavation prior to well point installation.
9	Install water treatment system (incl. water and wastewater storage tanks). Operate and maintain water treatment system as required. Always have 45,000L spare tank capacity at all times.		
10	Excavate soil at the site to bedrock (depths to bedrock as shown on Drawing C-09) and as per the Departmental Representative’s direction on the site. Establish safety perimeters around excavation.		Soil verification samples will be collected from the walls of the excavation only, by Departmental Representative.
11	Arrange for contaminated excavated soil (hazardous and non-hazardous) to be directly loaded into dump trucks and transported to an MOECC licensed waste disposal facility.		Under no circumstances shall hazardous, contaminated soil be stockpiled on-site. If non-hazardous, contaminated soil is to be temporarily stockpiled before being removed from the site, ensure that the soil is stockpiled on geomembrane and is covered up nightly to prevent generating of contaminated runoff.

No.	Checklist Item	Completed Y/N	Comments
12	Provide all weigh tickets from the recycle/disposal facilities promptly to the Departmental Representative after the completion of the remedial excavation activities.		Weigh tickets are the proof of disposal and must be provided for payment of the contractor.
13	Departmental Representative to obtain samples of the source and quality of the fill material prior to backfilling to confirm quality of fill satisfies CCME CEQG and/or MOECC Table 3 standards.		Backfilling not to proceed until analytical results have been received confirming fill quality.
14	Prior to backfilling, install clay liner in accordance with Section 31 32 19. Backfill the excavated area with clean, previously excavated soil and imported fill (meeting applicable guidelines and/or standards) as shown on drawings and as per the Departmental Representative's direction.		A geosynthetic clay liner, or equivalent upon agreement with Departmental Representative, will first be placed at the base of the excavation prior to backfilling. Backfilling with clean, previously excavated soil and imported fill should not proceed until Departmental Representative has received analytical results confirming quality.
15	Decommission 66 dewatering well points following backfilling activities.		Wells to be decommissioned in accordance with O.Reg.903.
16	Dismantle and remove dewatering system and water treatment system. Dispose of all used filter media, and recovered DNAPL/sediments off-site to an MOECC licensed facility approved by Departmental Representative.		
17	Reinstate asphalt surface cover as shown on drawings and in accordance with Section 32 12 16.		Compact in accordance with Drawings and provide proof of compaction.

CONTAMINATED SOIL REMOVAL MITIGATION MEASURES CHECKLIST, DEPARTMENT OF NATIONAL DEFENCE, 8 WING CFB TRENTON, FORMER HANGAR 6, ASTRA, ONTARIO

This checklist outlines the mitigation measures under the R.082882.001 Specifications and is intended to be used as an on-site tool for environmental protection with respect to remediation construction activities.

Table 2: Mitigation Measures Checklist

No.	Mitigation Item to be Implemented	Compliance Y/N	If NO, Reason for Non -Compliance
1	Work must be scheduled to avoid periods of heavy precipitation.		
2	Monitor the equipment, the remedial site limits and sediment prevention installed as part of remediation activities.		
3	Workers who may come in contact with hazardous soil must be provided with and use appropriate personal protective equipment. In addition, workers must follow the Project-specific Health and Safety Plan, the Provincial Occupational Health and Safety Act and any other appropriate legislation, regulations, guidelines, or best-management practices.		
4	Site access must be restricted to authorized workers only, and fencing installed around the excavation must be regularly inspected to prevent inadvertent access by persons.		
5	Dust suppression measures must be applied to prevent fugitive dust. The plan should consider different meteorological conditions, with application of water or a dust control agent (approved at the provincial and federal level).		
6	Tracking of mud/soil outside of the remedial site limits is to be minimized, through use of street sweepers, rumble strips at entrance and exit of vehicle decontamination pad.		
7	Ensure that non-remediation construction garbage is removed daily from the work area and disposed in appropriate waste containers.		
8	Vehicles to be in good working order and not be left idling on Site. Movement over exposed soil to be minimized.		
9	Restrict the movement of vehicles and machinery to the work areas and designated access points.		
10	Monitor the integrity of the fence, the implementation of Project-Specific Health and Safety Plan; and visual on-Site monitoring for dust.		
11	Wells to be decommissioned per applicable guidelines and regulations during site preparation activities prior to remedial activities.		
12	Regularly inspect and maintain the existing sediment control measures/equipment		
13	Sediment control structures (geotextile filter fabric) are to be used, as appropriate, to prevent the release of sediments and/or sediment laden water during the construction phase and inspected daily.		
14	Water treatment facility to be monitored and water samples collected at a frequency as specified in the mobile ECA or in accordance with Departmental Representative, to ensure That only treated water is discharged to the natural environment.		

END OF SECTION

CONTAMINATED SOIL REMOVAL SUBMITTALS CHECKLIST, DEPARTMENT OF NATIONAL DEFENCE, 8 WING CFB TRENTON, FORMER HANGAR 6, ASTRA, ONTARIO

This checklist outlines the main submittals for the contaminated soil removal under the R.082882.001 Specifications and is intended to be used as a tool to ensure that submittal requirements are accounted for as per the tender specifications. The Contractor is required to review each applicable Section for further details.

Table 1: Submittals Checklist

No.	Section	Checklist Item	Provided Y/N	Reason For Not Providing	Comments
1	01 11 06 – General Instructions	Construction Photographs			Submit electronic copy of colour digital photography in jpg format, standard resolution
2	01 11 06 – General Instructions	Samples			Submit duplicate samples of new materials being installed under this contract
3	01 11 06 – General Instructions	Cost Breakdown			Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating Contract Amount.
4	01 11 06 – General Instructions	Bar Chart Construction Schedule			On Award of Contract submit bar chart construction schedule for work
5	01 11 06 – General Instructions	Subcontractor List			Within 48 hours of acceptance of bid submit a list of subcontractors
6	01 14 00 – Work Restrictions	Security Escort Request			Submit an escort request to Departmental Representative at least 14 days before service is needed.
7	01 31 19 – Project Meetings	Progress Meeting Minutes			Submittals for Progress Meetings: make submittals at least 4 days prior to scheduled progress meetings
8	01 32 16 - Construction Progress Schedule	Bar (Gantt) Chart & Master Plan			Submit to Departmental Representative within 5 working days of Award of Contract a Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress
9	01 32 16 - Construction Progress Schedule	Project Schedule			Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan
10	01 33 00 – Submittals Procedures	Shop Drawings and Product Data			Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario of Canada. Allow 14 working days for Departmental Representative's review of each submission
11	01 33 00 – Submittals Procedures	Certificates			Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.
12	01 35 13.43 - Special Project Procedures For	Detailed Work Plan			Submit, prior to start of work, detailed work plan (including management of hazardous

	Contaminated Sites				wastes).
13	01 35 13.43 - Special Project Procedures For Contaminated Sites	Site Layout/Plan			Within 7 days after date of Notice to Proceed and prior to mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls.
14	01 35 13.43 - Special Project Procedures For Contaminated Sites	Equipment Decontamination Pad			submit equipment decontamination pad design, in accordance with Section 01 35 43, to Departmental Representative for review prior to commencing construction
15	01 35 13.43 - Special Project Procedures For Contaminated Sites	Hazardous Material's Employee Training			Submit documentation verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned
16	01 35 43 - Environmental Procedures	Sediment Control Plan			Provide sediment control plan that identifies type and location of sediment controls to be provided
17	01 35 29 - Health And Safety Requirements For Contaminated Sites	Site-Specific Health and Safety Plan			Submit within 7 days after date of Notice to Proceed and prior to commencement of Work
18	01 35 29 - Health And Safety Requirements For Contaminated Sites	Fire Safety Plan			Provide specific to the work location. Submit with Site-Specific Health and Safety Plan
19	01 35 29 - Health And Safety Requirements For Contaminated Sites	Utility Protection Plan			Provide a Utility Protection Plan to protection all utilities in accordance with Drawing C-04
20	01 35 29 - Health And Safety Requirements For Contaminated Sites	Communication Plan			Submit with Site-Specific Health and Safety Plan
21	01 35 29 - Health And Safety Requirements For Contaminated Sites	Contingency and Emergency Response Plan			Submit with Site-Specific Health and Safety Plan
22	01 35 29 - Health And Safety Requirements For Contaminated Sites	Material Safety Data Sheets (MSDS)			Submit with Site-Specific Health and Safety Plan
23	01 35 29 - Health And Safety Requirements For Contaminated Sites	Contractor Health and Safety Meetings			Submit records of Contractor's Health and Safety meetings when requested including orders, incident and accident reports and inspection reports.
24	01 35 29 - Health And Safety Requirements For Contaminated Sites	Workplace Safety and Insurance Board (WSIB) - Experience Rating Report.			Submit with Site-Specific Health and Safety Plan

25	01 35 29 - Health And Safety Requirements For Contaminated Sites	Filing of Notice			File Notice of Project with Provincial authorities prior to commencement of Work
26	01 35 43 - Environmental Procedures	Environmental Protection Plan (EPP)			After date of Notice to proceed and minimum 7 days prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan
27	01 35 43 - Environmental Procedures	Traffic Control & Access Ramp Construction Plan			Submit with EPP
28	01 35 43 - Environmental Procedures	Spill Control Plan			Submit with EPP
29	01 35 43 - Environmental Procedures	Non-Hazardous Solid Waste Disposal Plan			Submit with EPP
30	01 35 43 - Environmental Procedures	Hazardous Solid Waste Disposal Plan			Submit with EPP
31	01 35 43 - Environmental Procedures	Detailed Excavation Sequencing Plan			Submit with EPP
32	01 35 43 - Environmental Procedures	Air Pollution Control Plan			Submit with EPP
33	01 35 43 - Environmental Procedures	Contaminant Prevention Plan			Submit with EPP
34	01 52 00 – Construction Facilities	Hoist Plan			Submit with EPP. Hoisting must comply with lift plan stamped by Professional Engineer licensed to practice in Ontario.
35	01 74 20 – Construction and Demolition Waste Management	Waste Reduction Plan			Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill. Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site
36	02 50 00 – Site Remediation	Detailed Excavation Plan			Detailed excavation plan outlining facilities required, sloping requirements, any construction aids for structural support, or specific on-site professional personnel requirements (e.g. geotechnical engineer).
37	02 50 00 – Site Remediation	Master Dig Permit			Submit an application for a DND Master Dig Permit 6 weeks in advance of anticipated construction start date

38	31 00 01 – Backfilling and Grading	Backfill quality analytical and compaction testing results			Before backfill shipments are sent to site, provide certificate of analysis of backfill quality compared with applicable guidelines.
39	31 23 19 – Dewatering and Water Treatment	Dewatering Plan			Submit dewatering plan facility for review by Departmental Representative
40	31 23 19 – Dewatering and Water Treatment	Water Treatment Facility			Submit design of the water treatment facility for review by Departmental Representative
41	31 23 19 – Dewatering and Water Treatment	Water Treatment O&M manual			Within 10 working days of review by Departmental Representative of the shop drawing submittals for the water treatment system, prepare and submit three copies of the operations and maintenance (O&M) manual for the temporary water treatment system detailing the Contractor’s O&M activities
42	31 32 19.02 – Geosynthetic Clay Liner	Samples			Submit to Departmental Representative 2 weeks minimum before beginning Work samples: Minimum 300 mm x 300 mm samples of GCL.
43	31 32 19.02 – Geosynthetic Clay Liner	Certificates			Submit 2 copies of manufacturer's test data 2 weeks minimum before beginning Work. The GCL installer shall provide sufficient evidence of installation experience and competence with the specified geosynthetic materials.
44	31 32 19.02 – Geosynthetic Clay Liner	Product data			Submit manufacturer's instructions, printed product literature and data sheets (include product characteristics, performance criteria, physical size, finish and limitations)
45	31 32 20 – Geomembranes for Soil Remediation	Samples			Submit to Departmental Representative following samples at least 2 weeks prior to beginning Work. Minimum 2 m length of standard width membrane.
46	31 32 20 – Geomembranes for Soil Remediation	Product Data			Submit manufacturer's instructions, printed product literature and data sheets for geomembrane and include product characteristics, performance criteria, physical size, finish and limitations
47	31 32 20 – Geomembranes for Soil Remediation	Certificates/Test Reports			Submit to Departmental Representative copies of manufacturer's mill test data at least 4 weeks prior to start of work. Submit to Departmental Representative certificates, including test results, at least 2 weeks prior to delivery to job site.

48	32 12 13.16 – Asphalt Tack Coat	Asphalt Tack Coats			Submit two - 1 L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth jars to Departmental Representative, at least 2 weeks prior to beginning Work
49	32 12 13.23 – Asphalt Prime Coat	Asphalt Prime Coats			Submit two 1 L samples of asphalt prime proposed for use in new, clean, air tight sealed, wide mouth, jars or bottles made with plastic to Departmental Representative, 2 weeks prior to commencing Work
50	32 12 16 – Asphalt Paving	Asphalt Paving			Submit asphalt concrete mix design and trail mix test results to Departmental Representative for review at least 4 weeks prior to beginning Work
51	33 29 00 – Water Well Abandonment	Well Contractor Technician Licenses			Prior to the award of this Contract, provide the Departmental Representative with a copy of the well contractor and technician licenses
52	33 29 00 – Water Well Abandonment	Water Well Record			Water Well Record for each well abandoned, including Global Positioning System coordinates for well location
53	Appendix E	Remediation and Risk Management Construction Checklist			Complete the Remediation and Risk Management Construction Checklist in Appendix E and submit copy upon completion of work.
54	Appendix F	Mitigation Measures Checklist			Complete the Mitigations Checklist in Appendix E and submit copy upon completion of work.
55	Appendix G	Submittals Checklist			Complete the Submittals Checklist in Appendix G and submit copy upon completion of work.

END OF SECTION

04 11

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 millimetres

Public Works
Government Services
Canada

Architectural and
Engineering Services

Ontario Region

Travaux publics
Services gouvernementaux
Canada

Services d'architecture
et de génie

Région de l'Ontario

ASTRA, ONTARIO

8 WING/CFB TRENTON

AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL, FORMER HANGAR 6

PWGSC Proj. Nos.: R.082882.001

Canada

LIST OF DRAWINGS

REMEDIATION

ISSUED FOR TENDER
MAY 29, 2017

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27
revision		date

Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, BUILDING 65 (HANGAR 8)
ASTRA, ONTARIO

drawing title / titre du dessin
COVER SHEET/DRAWING INDEX

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-03-31
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-01

GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:1000 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001-C01_R082882.dwg

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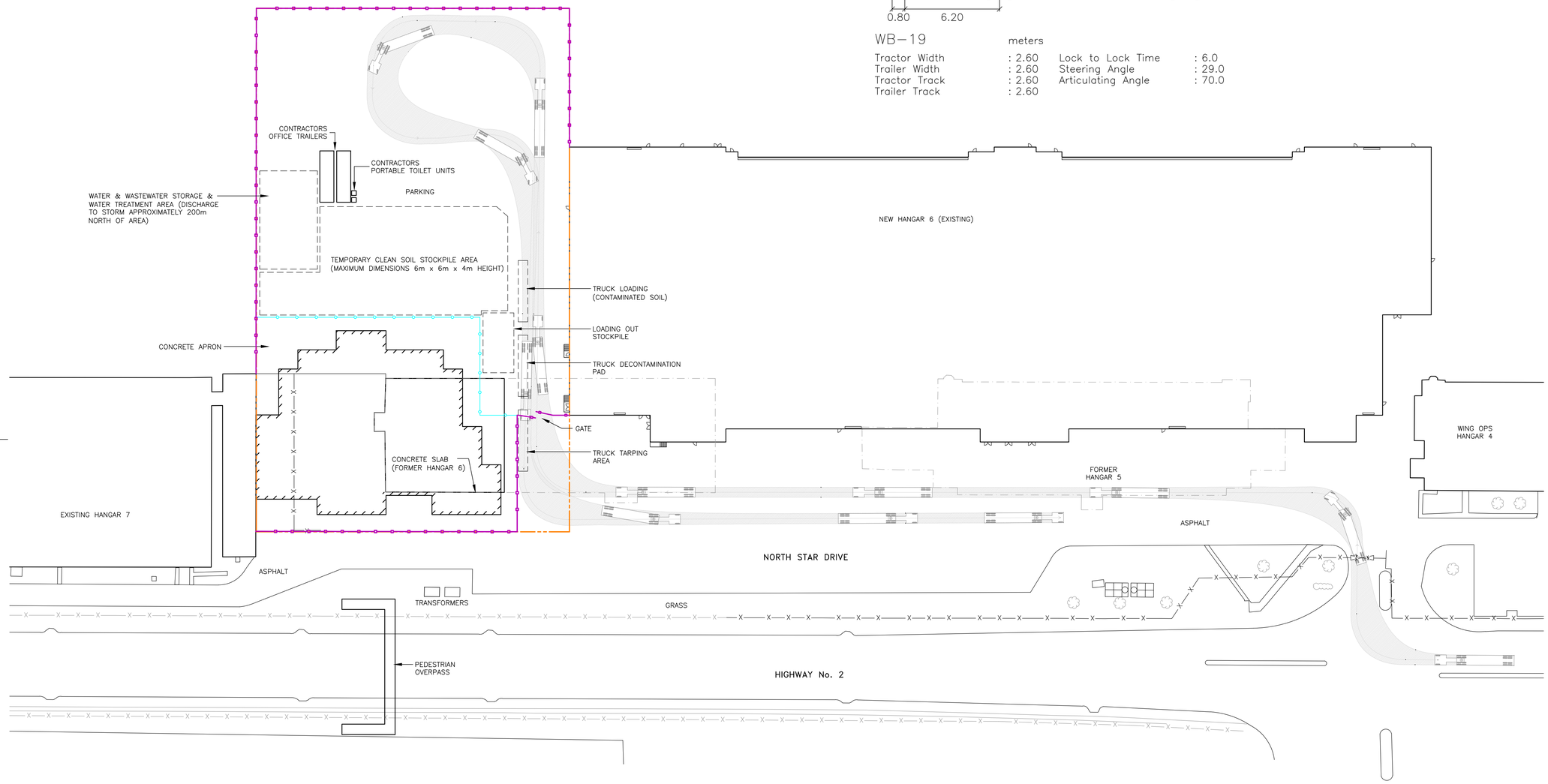

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND

- SITE LIMITS
- EXISTING BUILDING
- PROPOSED NEW BUILDING
- FORMER INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- EXISTING FENCE
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- PROPOSED AREA TO BE EXCAVATED

revision		date
04	ISSUED FOR TENDER	2017–05–29
03	ISSUED FOR CLIENT REVIEW	2017–03–31
02	ISSUED FOR CLIENT REVIEW	2017–03–22
01	ISSUED FOR CLIENT REVIEW	2017–02–27

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A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
SITE OVERVIEW

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017–05–18
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C–02

GSC–A1 DATE PLOTTED: 2017–03–31 PLOT SCALE: 1:600 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A–C02_R082882.dwg

04 11

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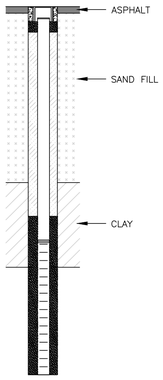
DETAIL 1 - BH/MW12-26 WELL DETAIL

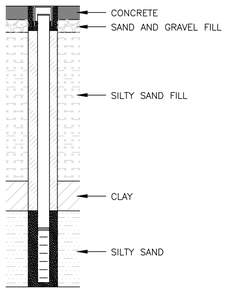
NOT TO SCALE



NOTE: REFER TO APPENDIX B FOR SPECIFIC MONITORING WELL DETAILS.

DETAIL 2 - BH/MW12-54 WELL DETAIL

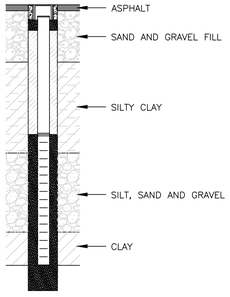
NOT TO SCALE



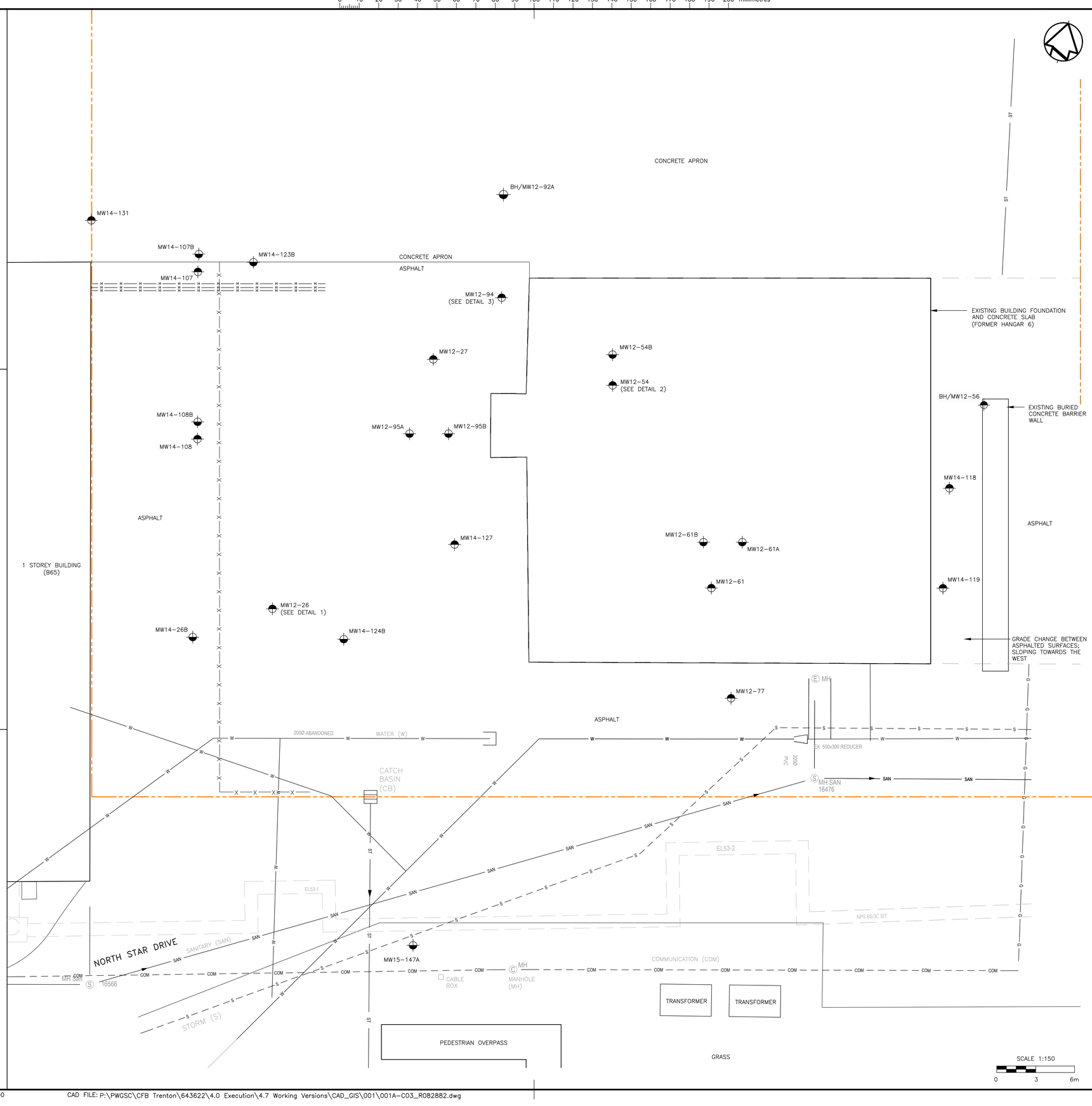
NOTE: REFER TO APPENDIX B FOR SPECIFIC MONITORING WELL DETAILS.

DETAIL 3 - BH/MW12-94 WELL DETAIL

NOT TO SCALE



NOTE: REFER TO APPENDIX B FOR SPECIFIC MONITORING WELL DETAILS.



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND

- SITE LIMITS
- X EXISTING FENCE
- FORMER INFRASTRUCTURE
- HIGH PRESSURE STEAM SERVICES
- H UNDERGROUND HYDRO SERVICES
- COM COMMUNICATION SERVICES
- SAN SANITARY SEWER SERVICES
- ST STORM SEWER SERVICES
- S STREET LIGHTING UNDERGROUND SERVICES
- G GAS SERVICES
- W WATER SERVICES
- EXISTING BEDROCK MONITORING WELL
- EXISTING OVERBURDEN MONITORING WELL

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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A Detail No. No. du détail
B drawing no. – where detail required dessin no. – où détail exigé
C drawing no. – where detailed dessin no. – où détaillé

project title
titre du projet

AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title
titre du dessin

EXISTING CONDITIONS

drawn by / dessine par: AG/EM

designed by / conc par: EK

approved by / approuve par: EL

bid / offre: RM

project manager / administrateur de projets

project date / date du projet: 2017-03-31

project no. / no. du projet: R.082882.001

drawing no. / dessine no.: C-03

GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C03_R082882.dwg

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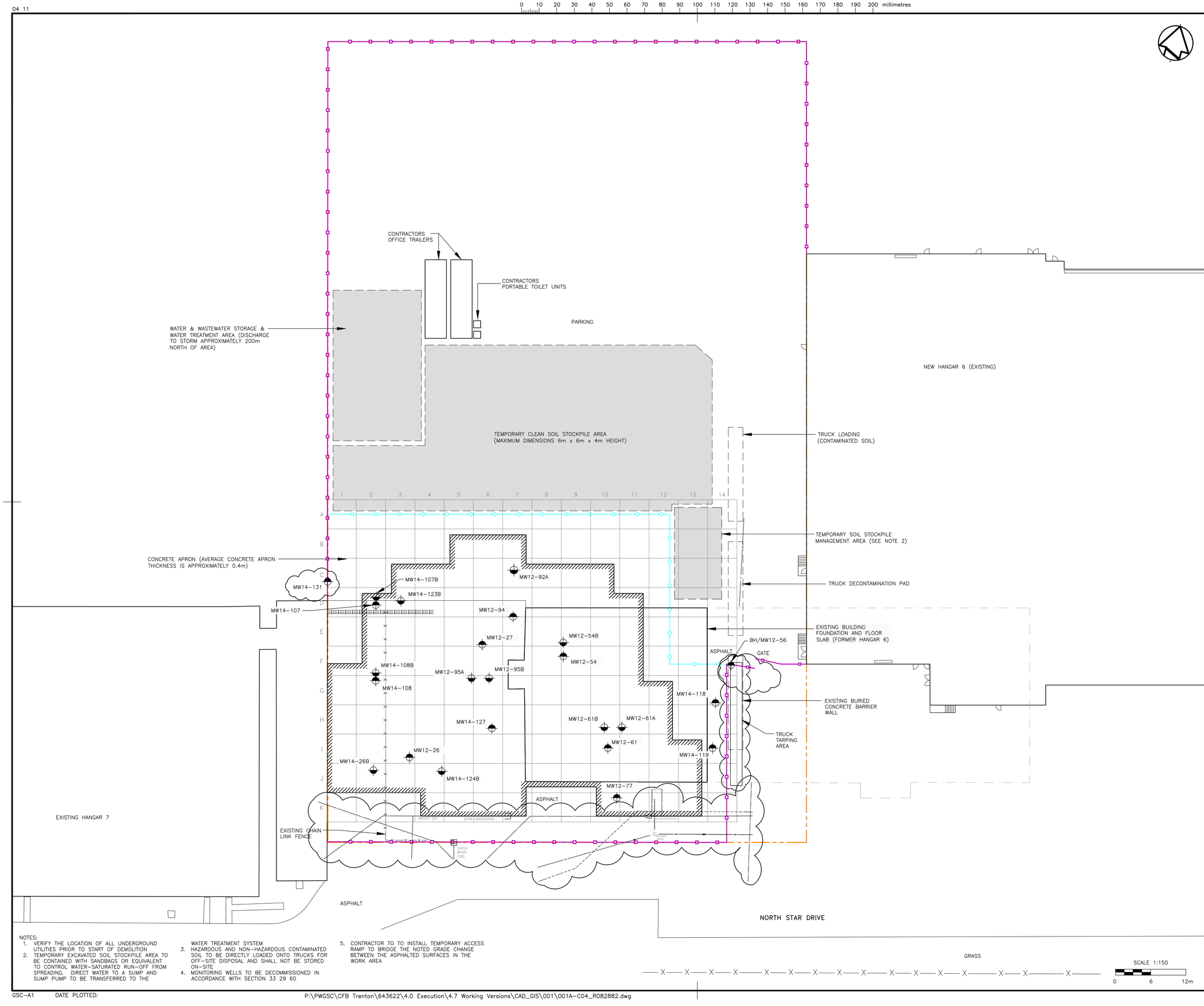

NOTES:
1. VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO START OF DEMOLITION
2. TEMPORARY EXCAVATED SOIL STOCKPILE AREA TO BE CONTAINED WITH SANDBAGS OR EQUIVALENT TO CONTROL WATER-SATURATED RUN-OFF FROM SPREADING. DIRECT WATER TO A SUMP AND SUMP PUMP TO BE TRANSFERRED TO THE WATER TREATMENT SYSTEM
3. HAZARDOUS AND NON-HAZARDOUS CONTAMINATED SOIL TO BE DIRECTLY LOADED ONTO TRUCKS FOR OFF-SITE DISPOSAL AND SHALL NOT BE STORED ON-SITE
4. MONITORING WELLS TO BE DECOMMISSIONED IN ACCORDANCE WITH SECTION 33 29 60
5. CONTRACTOR TO TO INSTALL TEMPORARY ACCESS RAMP TO BRIDGE THE NOTED GRADE CHANGE BETWEEN THE ASPHALTED SURFACES IN THE WORK AREA

SCALE 1:150
0 6 12m

GSC-A1 DATE PLOTTED: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C04_R082882.dwg

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KEY PLAN NOT TO SCALE

LEGEND
- SITE LIMITS
- EXISTING BUILDING
- FORMER INFRASTRUCTURE
- FORMER INFRASTRUCTURE
- EXISTING FENCE
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- EXISTING BEDROCK MONITORING WELL
- EXISTING OVERBURDEN MONITORING WELL
- TO BE PROTECTED
- PROPOSED AREA TO BE EXCAVATED

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE, 8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
TEMPORARY SITE WORKS LAYOUT

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-04

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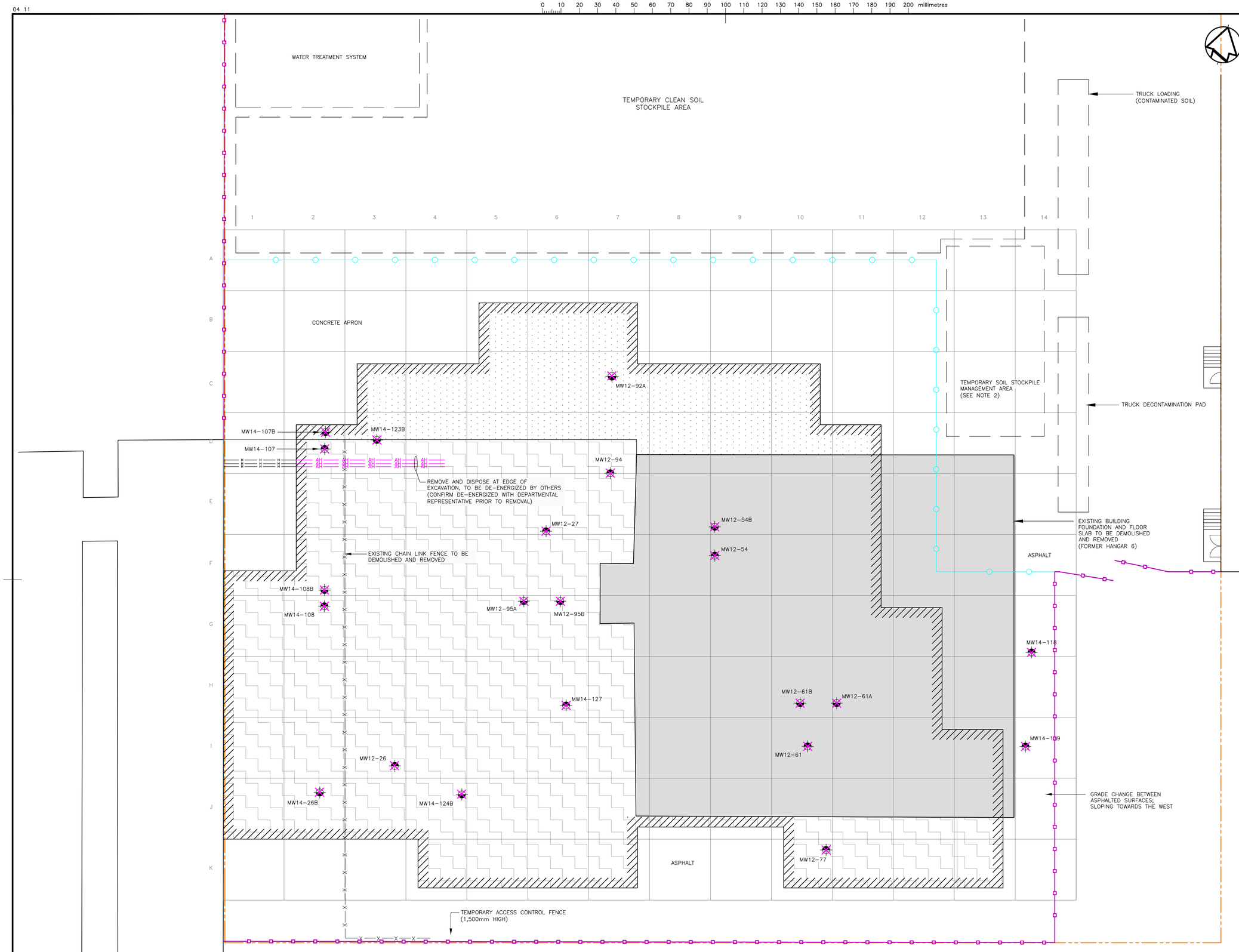

NOTES:
1. VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO START OF DEMOLITION
2. TEMPORARY EXCAVATED SOIL STOCKPILE AREA TO BE CONTAINED WITH SANDBAGS OR EQUIVALENT TO CONTROL WATER-SATURATED RUN-OFF FROM SPREADING. DIRECT WATER TO A SUMP AND SUMP PUMP TO BE TRANSFERRED TO THE WATER TREATMENT SYSTEM
3. HAZARDOUS AND NON-HAZARDOUS CONTAMINATED SOIL TO BE DIRECTLY LOADED ONTO TRUCKS FOR OFF-SITE DISPOSAL AND SHALL NOT BE STORED ON-SITE
4. MONITORING WELLS TO BE DECOMMISSIONED IN ACCORDANCE WITH SECTION 33 29 60
5. CONTRACTOR TO BREAK NON-REINFORCED PORTION OF THE CONCRETE APRON (AVERAGE CONCRETE APRON THICKNESS IS APPROXIMATELY 0.4m) WITHIN NORTHERN PORTION OF EXCAVATION
6. CONTRACTOR TO HAVE DND MASTER DIG PERMIT PRIOR TO ANY GROUND DISTRUBANCE WORK. APPLICATION FOR MASTER DIG PERMIT TO BE SUBMITTED TO DEPARTMENT REPRESENTATIVE 6 WEEKS IN ADVANCE OF ANTICIPATED CONSTRUCTION START
7. CONTRACTOR TO INSTALL TEMPORARY ACCESS RAMP TO BRIDGE THE NOTED GRADE CHANGE BETWEEN THE ASPHALTED SURFACES IN THE WORK AREA

SCALE 1:150
0 3 6m

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND
- SITE LIMITS
- EXISTING FENCE
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- EXISTING BEDROCK MONITORING WELL
- EXISTING OVERBURDEN MONITORING WELL
- TO BE DECOMMISSIONED
- PROPOSED AREA TO BE EXCAVATED
- EXISTING CONCRETE APRON TO BE DEMOLISHED & DISPOSED
- EXISTING CONCRETE SLAB TO BE DEMOLISHED & DISPOSED
- EXISTING ASPHALT SURFACE TO BE DEMOLISHED & DISPOSED

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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A Detail No. No. du détail
B drawing no. – where detail required dessin no. – où détail exigé
C drawing no. – where detailed dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE, 8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
DEMOLITION PLAN

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-05

GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C05_R082882.dwg

04 11

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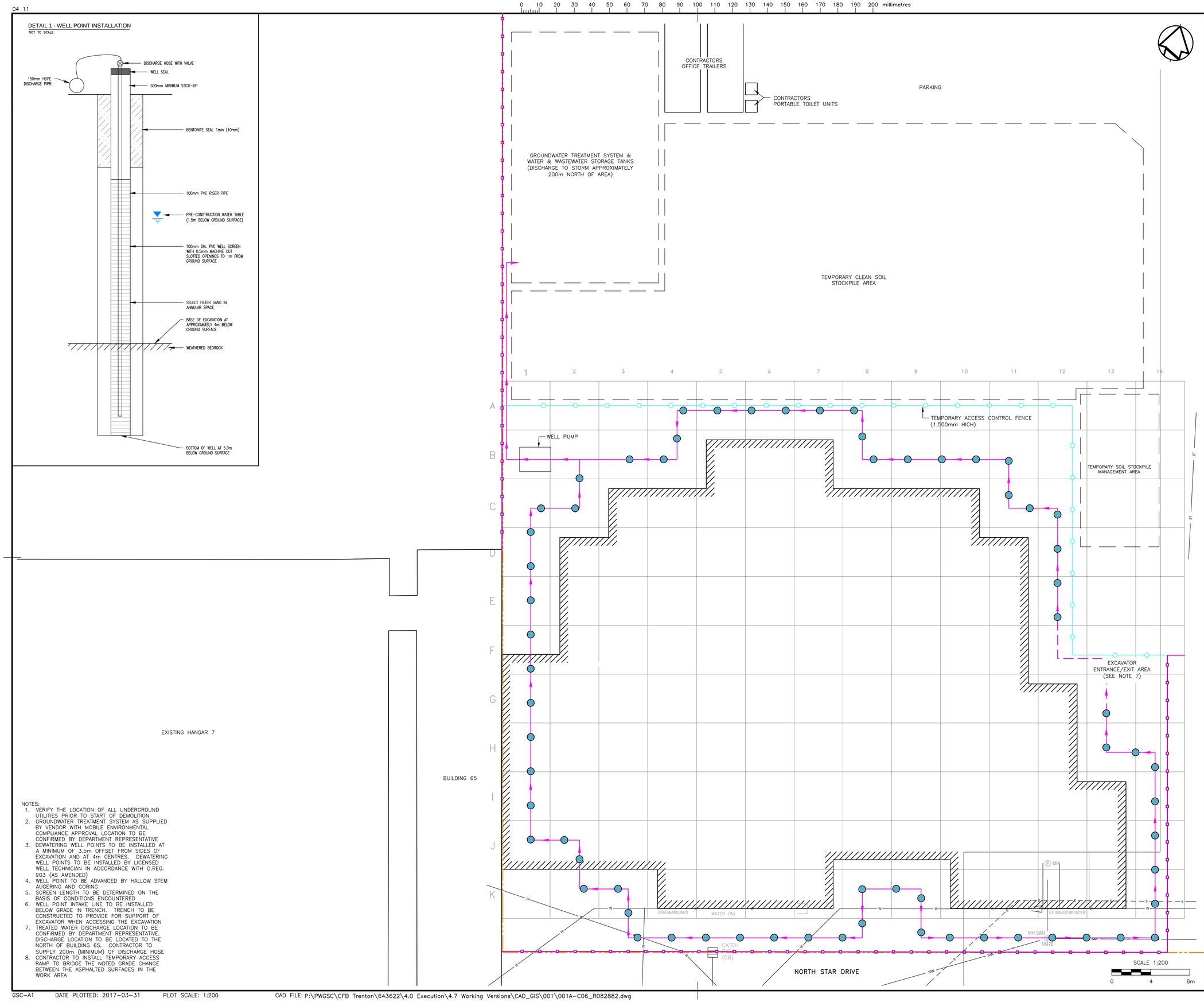
DETAIL 1 - WELL POINT INSTALLATION

NOT TO SCALE



NOTES:
1. VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO START OF DEMOLITION
2. GROUNDWATER TREATMENT SYSTEM AS SUPPLIED BY VENDOR WITH MOBILE ENVIRONMENTAL COMPLIANCE APPROVAL LOCATION TO BE CONFIRMED BY DEPARTMENT REPRESENTATIVE
3. DEWATERING WELL POINTS TO BE INSTALLED AT A MINIMUM OF 3.5m OFFSET FROM SIDES OF EXCAVATION AND AT 4m CENTRES. DEWATERING WELL POINTS TO BE INSTALLED BY LICENSED WELL TECHNICIAN IN ACCORDANCE WITH O.REG. 903 (AS AMENDED)
4. WELL POINT TO BE ADVANCED BY HALLOW STEM AUGERING AND CORING
5. SCREEN LENGTH TO BE DETERMINED ON THE BASIS OF CONDITIONS ENCOUNTERED
6. WELL POINT INTAKE LINE TO BE INSTALLED BELOW GRADE IN TRENCH. TRENCH TO BE CONSTRUCTED TO PROVIDE FOR SUPPORT OF EXCAVATOR WHEN ACCESSING THE EXCAVATION
7. TREATED WATER DISCHARGE LOCATION TO BE CONFIRMED BY DEPARTMENT REPRESENTATIVE. DISCHARGE LOCATION TO BE LOCATED TO THE NORTH OF BUILDING 65. CONTRACTOR TO SUPPLY 200m (MINIMUM) OF DISCHARGE HOSE
8. CONTRACTOR TO INSTALL TEMPORARY ACCESS RAMP TO BRIDGE THE NOTED GRADE CHANGE BETWEEN THE ASPHALTED SURFACES IN THE WORK AREA

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND
- SITE LIMITS
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- INTAKE LINES AND FLOW DIRECTION
- DEWATERING WELL POINT
- PROPOSED AREA TO BE EXCAVATED

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE, 8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
TEMPORARY SITE WORKS FOR EXCAVATION DEWATERING

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM — project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-06

GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:200 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C06_R082882.dwg

04 11

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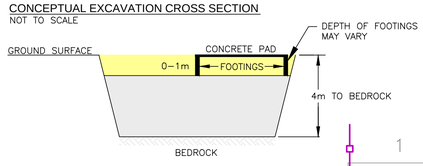
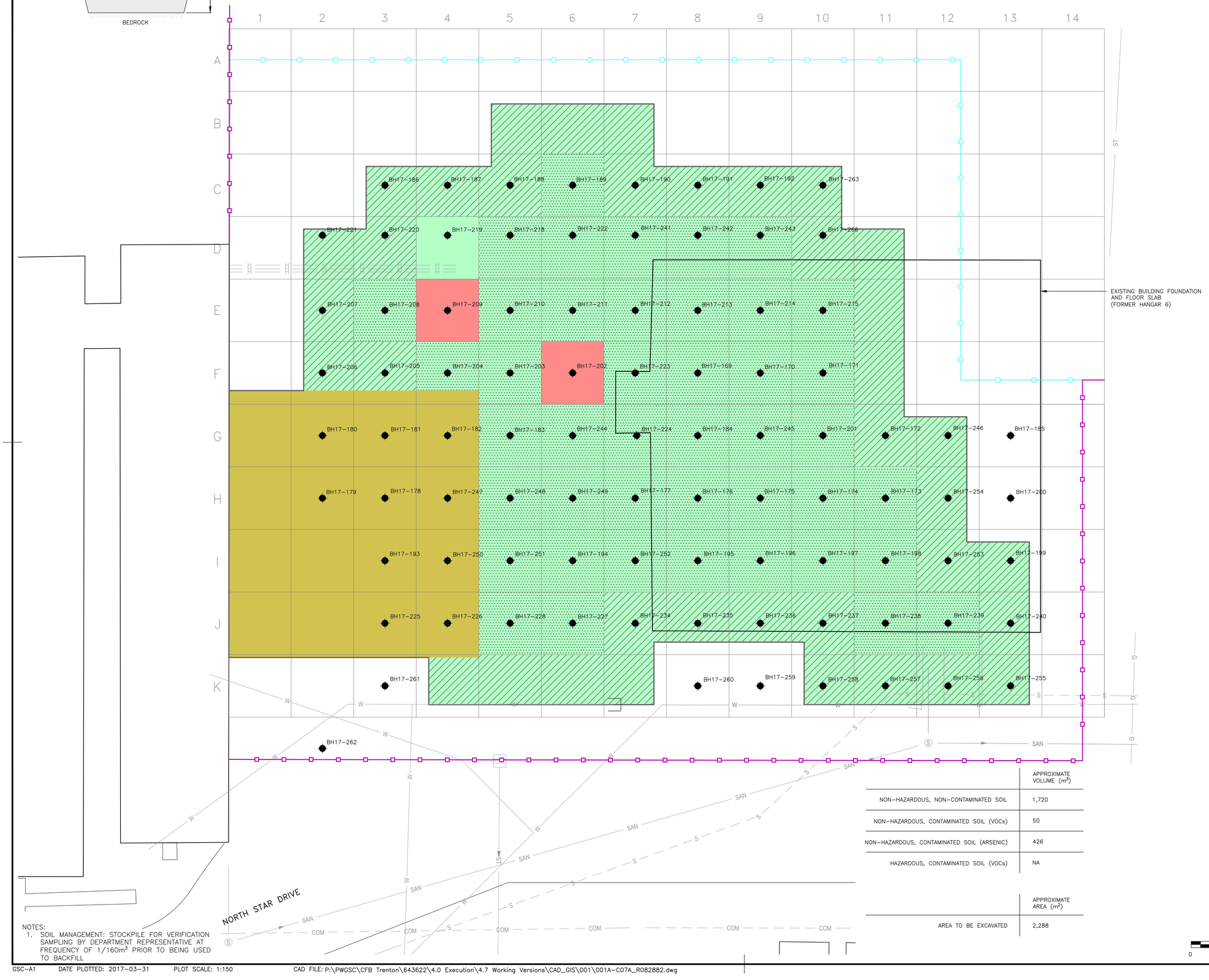
CONCEPTUAL EXCAVATION CROSS SECTION

NOT TO SCALE





NOTES:
1. SOIL MANAGEMENT: STOCKPILE FOR VERIFICATION SAMPLING BY DEPARTMENT REPRESENTATIVE AT FREQUENCY OF 1/160m^3 PRIOR TO BEING USED TO BACKFILL

	APPROXIMATE VOLUME (m^3)
NON–HAZARDOUS, NON–CONTAMINATED SOIL	1,720
NON–HAZARDOUS, CONTAMINATED SOIL (VOCs)	50
NON–HAZARDOUS, CONTAMINATED SOIL (ARSENIC)	426
HAZARDOUS, CONTAMINATED SOIL (VOCs)	NA

	APPROXIMATE AREA (m^2)
AREA TO BE EXCAVATED	2,288

SCALE 1:150

0 3 6m

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- PROPOSED AREA TO BE EXCAVATED (TOP ELEVATION SHOWN)
- NON–HAZARDOUS, CONTAMINATED SOIL (ARSENIC)
- SLOPED PORTION OF EXCAVATION
- NON–HAZARDOUS, NON–CONTAMINATED SOIL (VOCs)
- NON–HAZARDOUS, CONTAMINATED SOIL (VOCs)
- HAZARDOUS, CONTAMINATED SOIL (VOCs)
- CLEAN SOIL TO BE EXCAVATED TO ACCESS CONTAMINATED SOIL BENEATH
- BOREHOLE

revision		date
04	ISSUED FOR TENDER	2017–05–29
03	ISSUED FOR CLIENT REVIEW	2017–03–31
02	ISSUED FOR CLIENT REVIEW	2017–03–22
01	ISSUED FOR CLIENT REVIEW	2017–02–27

Do not scale drawings.
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A Detail No. No. du détail
B drawing no. – where detail required dessin no. – où détail exigé
C drawing no. – where detailed dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE, 8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
EXCAVATION PLAN (0–1m bgs)

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017–05–19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C–07A

GSC–A1 DATE PLOTTED: 2017–03–31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A–C07A_R082882.dwg

04 11

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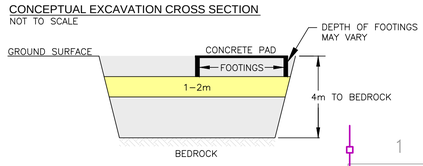
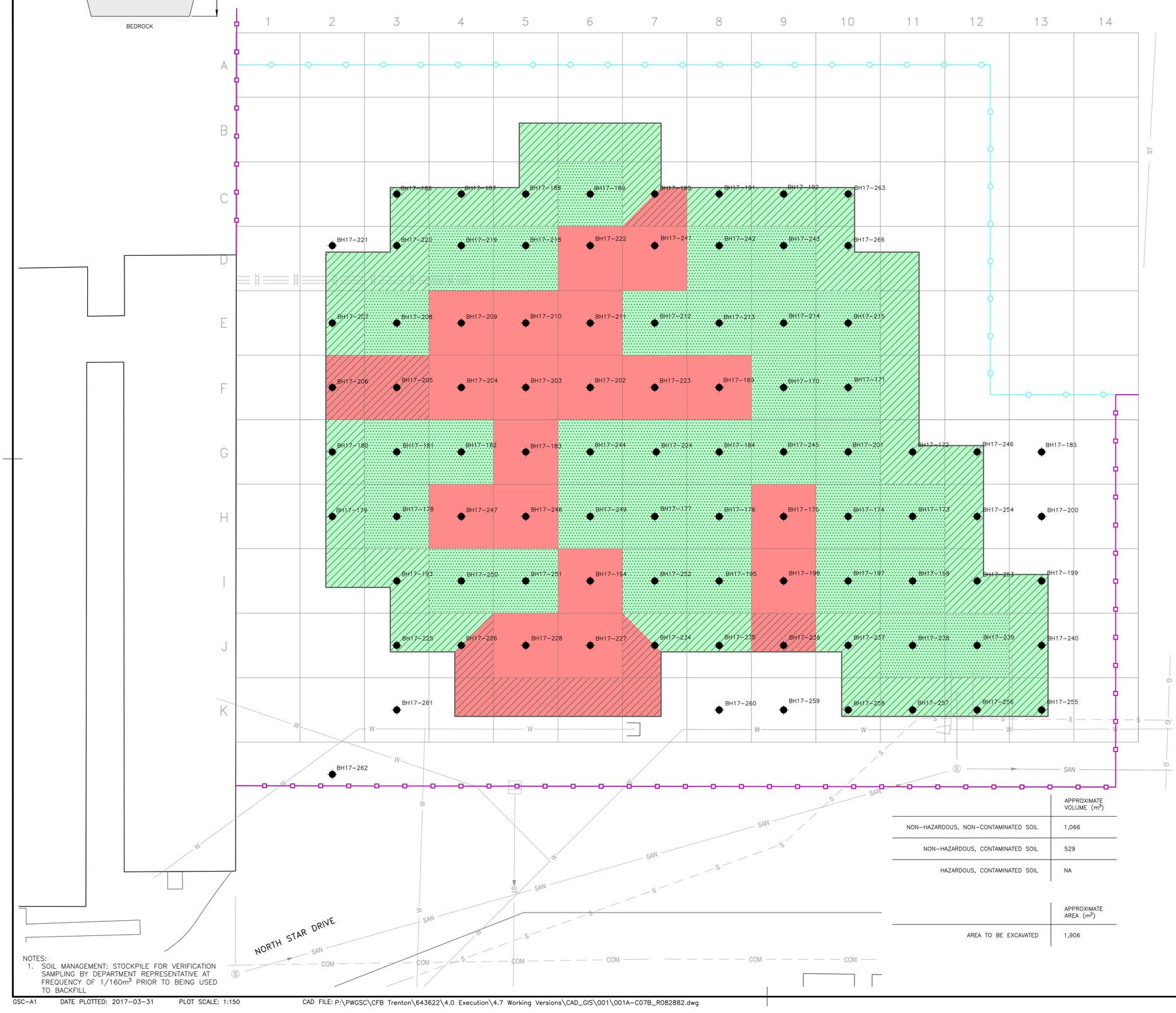
CONCEPTUAL EXCAVATION CROSS SECTION

NOT TO SCALE





	APPROXIMATE VOLUME (m^3)
NON–HAZARDOUS, NON–CONTAMINATED SOIL	1,066
NON–HAZARDOUS, CONTAMINATED SOIL	529
HAZARDOUS, CONTAMINATED SOIL	NA

	APPROXIMATE AREA (m^2)
AREA TO BE EXCAVATED	1,906

NOTES:
1. SOIL MANAGEMENT: STOCKPILE FOR VERIFICATION SAMPLING BY DEPARTMENT REPRESENTATIVE AT FREQUENCY OF 1/160m^3 PRIOR TO BEING USED TO BACKFILL

SCALE 1:150
0 3 6m

Public Works and Government Services Canada
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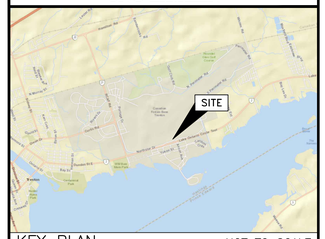

KEY PLAN NOT TO SCALE

LEGEND
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- PROPOSED AREA TO BE EXCAVATED (TOP ELEVATION SHOWN)
- SLOPED PORTION OF EXCAVATION
- NON–HAZARDOUS, NON–CONTAMINATED SOIL (VOCs)
- NON–HAZARDOUS, CONTAMINATED SOIL (VOCs)
- HAZARDOUS, CONTAMINATED SOIL (VOCs)
- CLEAN SOIL TO BE EXCAVATED TO ACCESS CONTAMINATED SOIL BENEATH
- BOREHOLE

revision		date
04	ISSUED FOR TENDER	2017–05–29
03	ISSUED FOR CLIENT REVIEW	2017–03–31
02	ISSUED FOR CLIENT REVIEW	2017–03–22
01	ISSUED FOR CLIENT REVIEW	2017–02–27

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A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
EXCAVATION PLAN (1–2m bgs)

drawn by / dessine par	AG/EM
designed by / conc par	EK
approved by / approuve par	EL
bid / offre	RM
project manager / administrateur de projets	
project date / date du projet	2017–05–19
project no. / no. du projet	R.082882.001
drawing no. / dessine no.	C–07B

04 11

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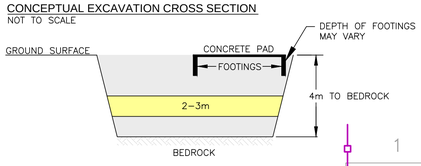
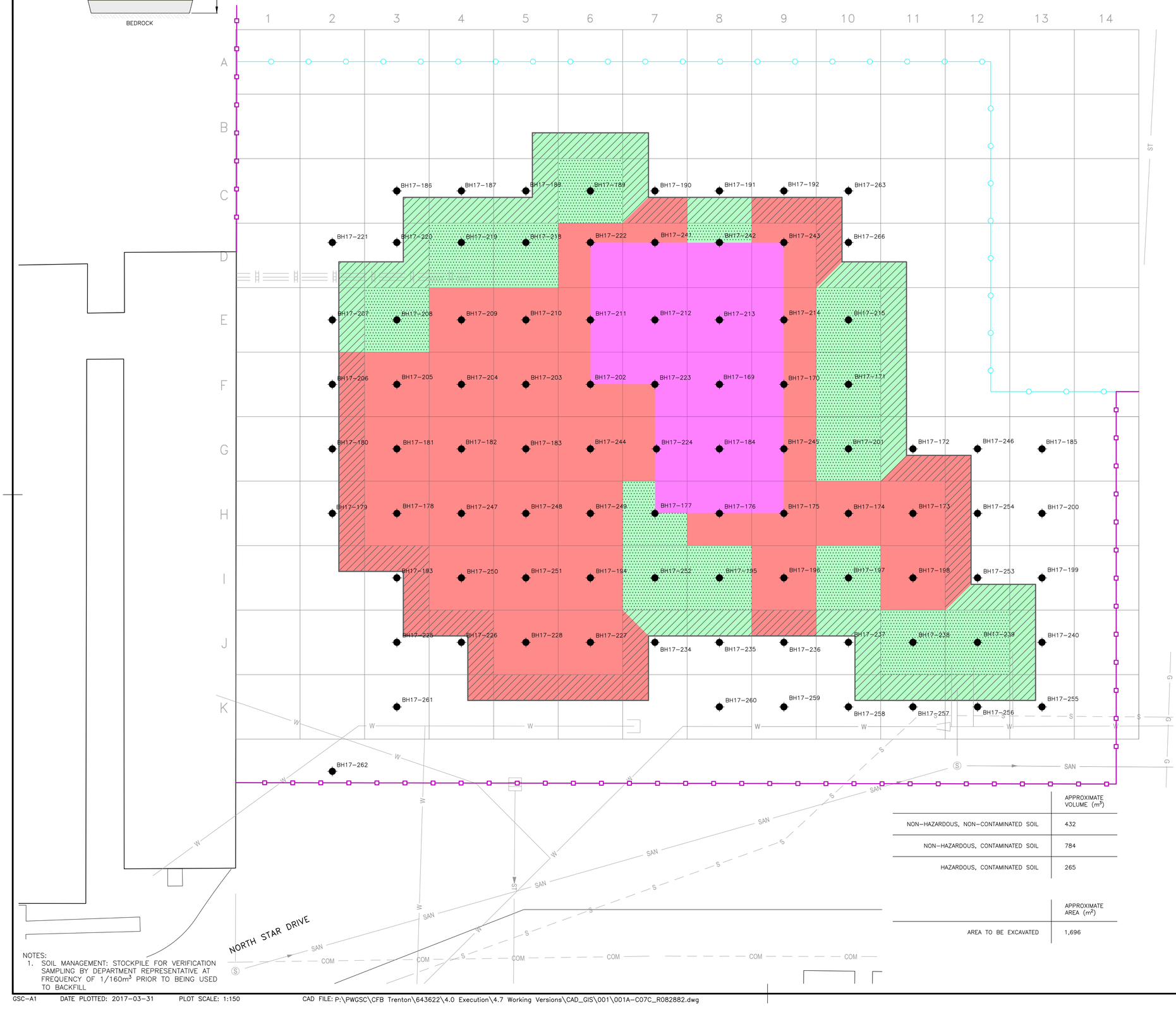
CONCEPTUAL EXCAVATION CROSS SECTION

NOT TO SCALE





	APPROXIMATE VOLUME (m^3)
NON–HAZARDOUS, NON–CONTAMINATED SOIL	432
NON–HAZARDOUS, CONTAMINATED SOIL	784
HAZARDOUS, CONTAMINATED SOIL	265

	APPROXIMATE AREA (m^2)
AREA TO BE EXCAVATED	1,696

NOTES:
1. SOIL MANAGEMENT: STOCKPILE FOR VERIFICATION SAMPLING BY DEPARTMENT REPRESENTATIVE AT FREQUENCY OF 1/160m^3 PRIOR TO BEING USED TO BACKFILL

SCALE 1:150
0 3 6m

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Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- PROPOSED AREA TO BE EXCAVATED (TOP ELEVATION SHOWN)
- SLOPED PORTION OF EXCAVATION
- NON–HAZARDOUS, NON–CONTAMINATED SOIL (VOCs)
- NON–HAZARDOUS, CONTAMINATED SOIL (VOCs)
- HAZARDOUS, CONTAMINATED SOIL (VOCs)
- CLEAN SOIL TO BE EXCAVATED TO ACCESS CONTAMINATED SOIL BENEATH
- BOREHOLE

04	ISSUED FOR TENDER	2017–05–29
03	ISSUED FOR CLIENT REVIEW	2017–03–31
02	ISSUED FOR CLIENT REVIEW	2017–03–22
01	ISSUED FOR CLIENT REVIEW	2017–02–27
revision		date

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A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE, 8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
EXCAVATION PLAN (2–3m bgs)

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017–05–19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C–07C

GSC–A1 DATE PLOTTED: 2017–03–31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A–C07C_R082882.dwg

04 11

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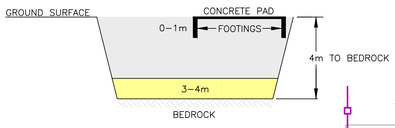
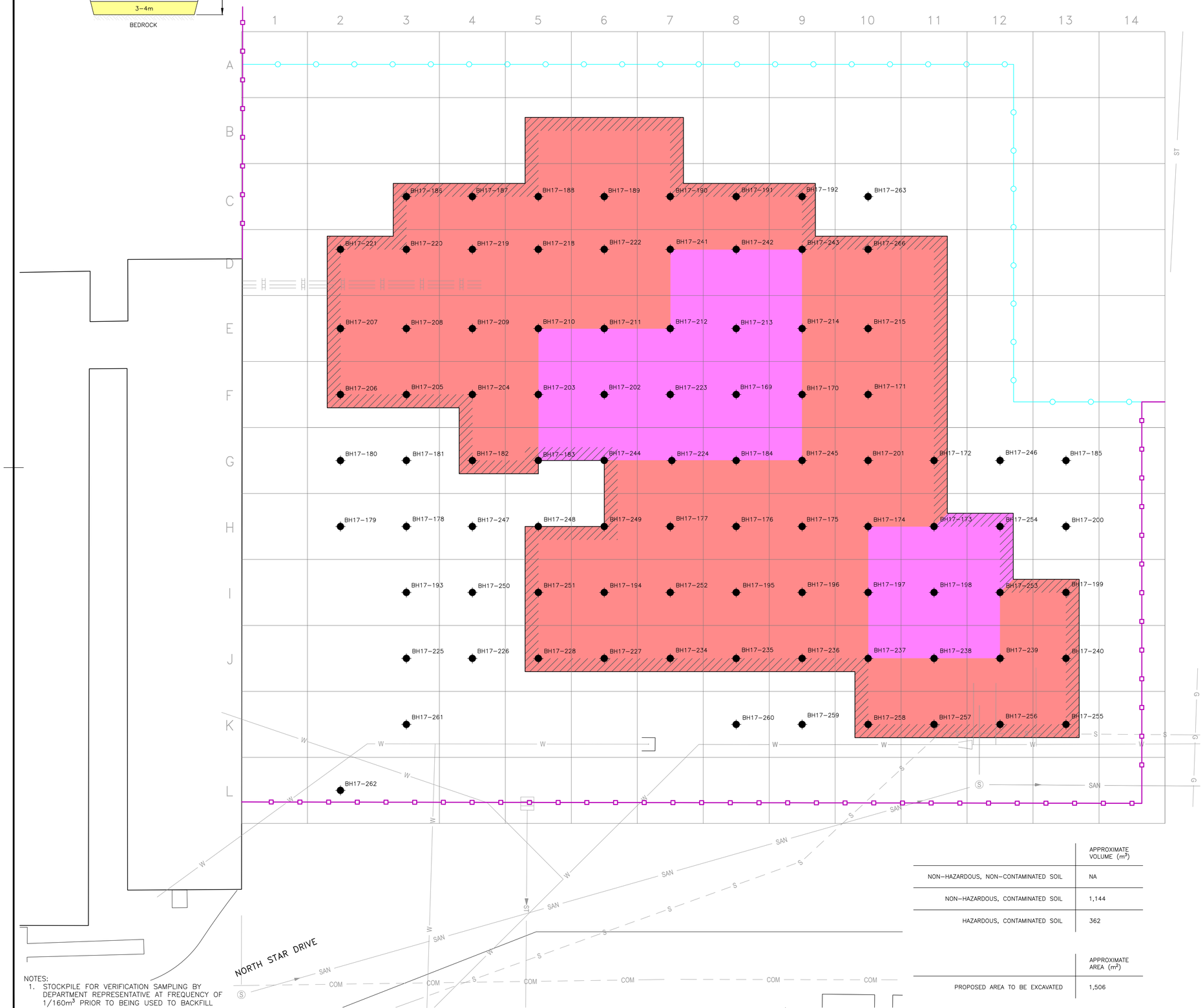
CONCEPTUAL EXCAVATION CROSS SECTION
NOT TO SCALE





	APPROXIMATE VOLUME (m^3)
NON–HAZARDOUS, NON–CONTAMINATED SOIL	NA
NON–HAZARDOUS, CONTAMINATED SOIL	1,144
HAZARDOUS, CONTAMINATED SOIL	362

	APPROXIMATE AREA (m^2)
PROPOSED AREA TO BE EXCAVATED	1,506

NOTES:
1. STOCKPILE FOR VERIFICATION SAMPLING BY DEPARTMENT REPRESENTATIVE AT FREQUENCY OF 1/160m^3 PRIOR TO BEING USED TO BACKFILL

SCALE 1:150
0 3 6m

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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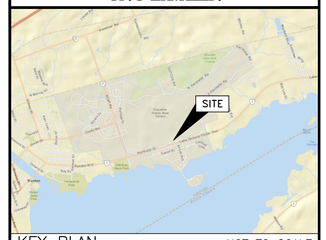

KEY PLAN NOT TO SCALE

LEGEND
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- PROPOSED AREA TO BE EXCAVATED (TOP ELEVATION SHOWN)
- SLOPED PORTION OF EXCAVATION
- NON–HAZARDOUS, NON–CONTAMINATED SOIL
- NON–HAZARDOUS, CONTAMINATED SOIL
- HAZARDOUS, CONTAMINATED SOIL
- BOREHOLE

04		
03		
02	ISSUED FOR TENDER	2017–05–29
01	ISSUED FOR CLIENT REVIEW	2017–02–27
revision		date

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B drawing no. – where detail required / dessin no. – où détail exigé
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project title / titre du projet
CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING CFB TRENTON, FORMER HANGAR 6
TRENTON, ONTARIO

drawing title / titre du dessin
EXCAVATION PLAN – SCENARIO 2
(3m bgs TO BEDROCK)

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017–05–29
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C–07D

GSC–A1 DATE PLOTTED: 2017–03–15 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A–C07D_R082882.dwg

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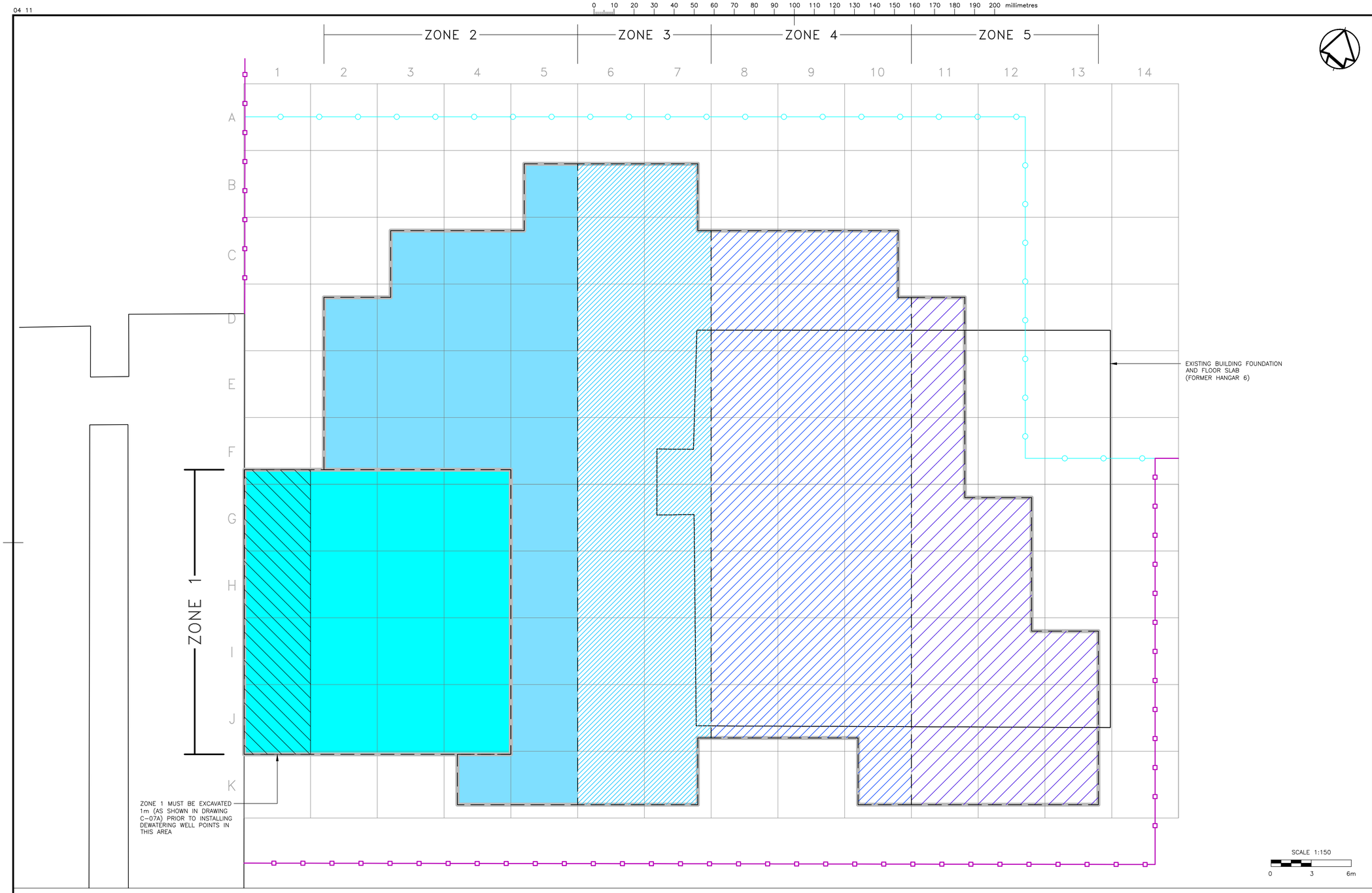

SEQUENCE OVERVIEW (MAIN ACTIVITIES):

PRIOR TO EXCAVATION

1. LOCATE ALL UTILITIES; VERIFY HYDRO LINE DE-ENERGIZED BY OTHERS AND PROTECT ALL OTHER UTILITIES AS SHOWN ON DRAWING C-04.
2. DECOMMISSION NOTED MONITORING WELLS AS SHOWN ON DRAWING C-05.
3. MOBILIZE AND HOOK-UP TRAILERS AND PORTABLE TOILET FACILITIES.
4. DEFINE WORK ZONES WITH TEMPORARY CONSTRUCTION FENCING AND SEAL ANY BUILDING DOORS AS NOTED.
5. MOBILIZE WATER TREATMENT SYSTEM, HOOK-UP AND CONNECT TO DISCHARGE POINT (~200m) AND POWER SOURCE (<200m)
4. SET-UP TRUCK DECONTAMINATION PAD, TARPING STATION.

DURING EXCAVATION

ZONE 1

1. EXCAVATE AEC-4, ARSENIC CONTAMINATED SOIL. THIS IS ONLY PRESENT IN LIFT 1 (0-1m BGS).
2. REMOVE AND DISPOSE OF ASPHALT SURFACING CONCRETE APRONS/PADDING, AND DE-ENERGIZED UTILITIES AS SHOWN ON DRAWING C-05.
3. INSTALL DEWATERING WELLS AND COLLECTION SYSTEM, POST-EXCAVATION OF ZONE 1 TO 1m BELOW EXISTING GRADE
4. COMMENCE DEWATERING, MONITOR PRE-TREATED AND POST-TREATED WATER. DO NOT DISCHARGE UNTIL PWQOS ARE MET. RECIRCULATE IF REQUIRED. BACKWASH FILTERS WHEN REQUIRED.
5. EXCAVATE AEC-3, ZONE 1, LIFT 1, TWO CONTAMINATED, NON-HAZARDOUS "GRIDS".
6. CONTINUE WITH ZONE 1, LIFTS 2, 3 AND 4 TO BEDROCK AS INDICATED IN THE EXCAVATION PLANS, SEPARATING SOIL BY CATEGORY AND MAINTAINING THE 1:1 SLOPE.
7. USING A VACUUM TRUCK OR EQUIVALENT, REMOVE ANY RESIDUALS AND LIQUIDS FROM THE TOP OF THE EXPOSED BEDROCK.
8. PLACE GEOSYNTHETIC CLAY LINER OVER THE EXPOSED BEDROCK.
9. PLACE THE CLEAN FILL FOR RE-USE WITH APPROVAL FROM DND REPRESENTATIVE. MAINTAIN A 1:1 SLOPE FACING ZONE 3. BACKFILL UPPER LIFT IN ACCORDANCE WITH THE SPECIFICATION AND DRAWING C-10

ZONE 2

1. CONTINUE ON TO ZONE 2, BACKFILLING/COMPACTING ZONE 1.

ZONE 3

1. CONTINUE ON TO ZONE 3, BACKFILLING/COMPACTING ZONE 1 AND 2 IN PARALLEL.

ZONE 4

1. PROCEED WITH THE ZONE 4 EXCAVATION, BACKFILLING/COMPACTING ZONE 3.

ZONE 5

1. PROCEED WITH THE ZONE 5 EXCAVATION, BACKFILLING/COMPACTING ZONE 4.

POST EXCAVATION

1. DECONTAMINATE HEAVY EQUIPMENT.
2. REMOVE DECONTAMINATION STATION AND TARPING STATION
3. DECOMMISSION NOTED DEWATERING WELLS.
4. PAVE THE PORTION OF THE EXCAVATION AS NOTED IN DRAWING C-10.
5. DEMOBILIZE WATER TREATMENT SYSTEM.
7. DEMOBILIZE AND DISCONNECT TRAILERS AND PORTABLE TOILET FACILITIES.
8. REMOVE TEMPORARY CONSTRUCTION FENCING AND UNSEAL ANY BUILDING DOORS AS NOTED.

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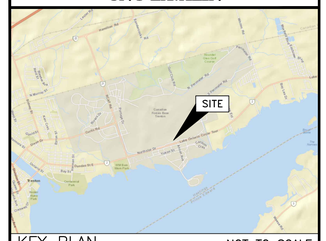

KEY PLAN NOT TO SCALE

LEGEND
- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- PROPOSED AREA TO BE EXCAVATED (TOP ELEVATION SHOWN)

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
SEQUENCE OVERVIEW

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-08

GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C08_R082882.dwg

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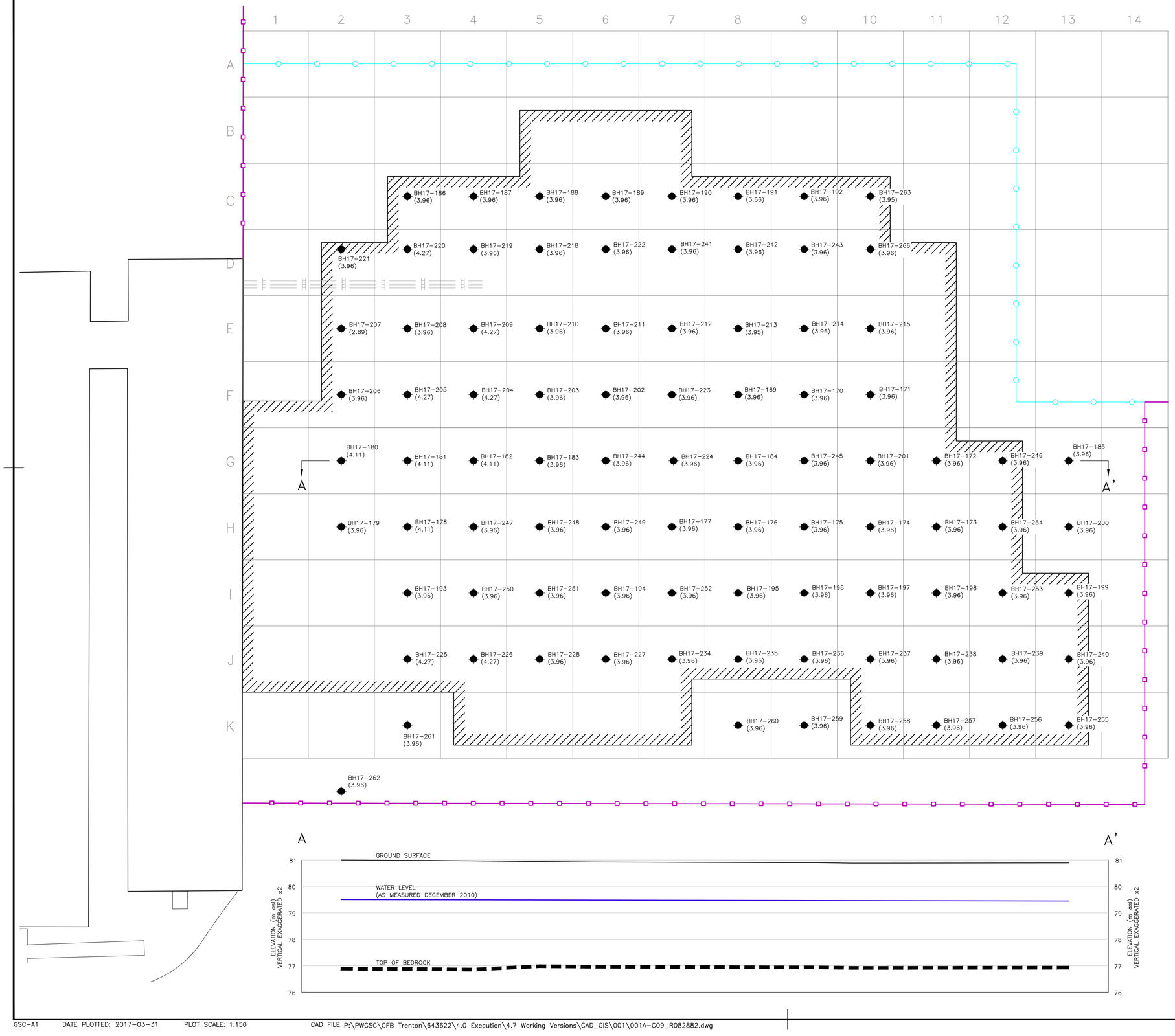
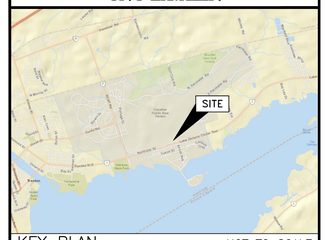


SCALE 1:150
0 3 6m

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

SNC·LAVALIN



KEY PLAN NOT TO SCALE

LEGEND

- PROPOSED TEMPORARY BARRIER/FENCE (SITE)
- PROPOSED TEMPORARY BARRIER/FENCE (EXCAVATION)
- BOREHOLE
- (3.96) DEPTH TO BEDROCK
- PROPOSED AREA TO BE EXCAVATED

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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A Detail No. No. du détail
B drawing no. – where detail required dessin no. – où détail exigé
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project title
titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title
titre du dessin
DEPTH TO BEDROCK

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-09

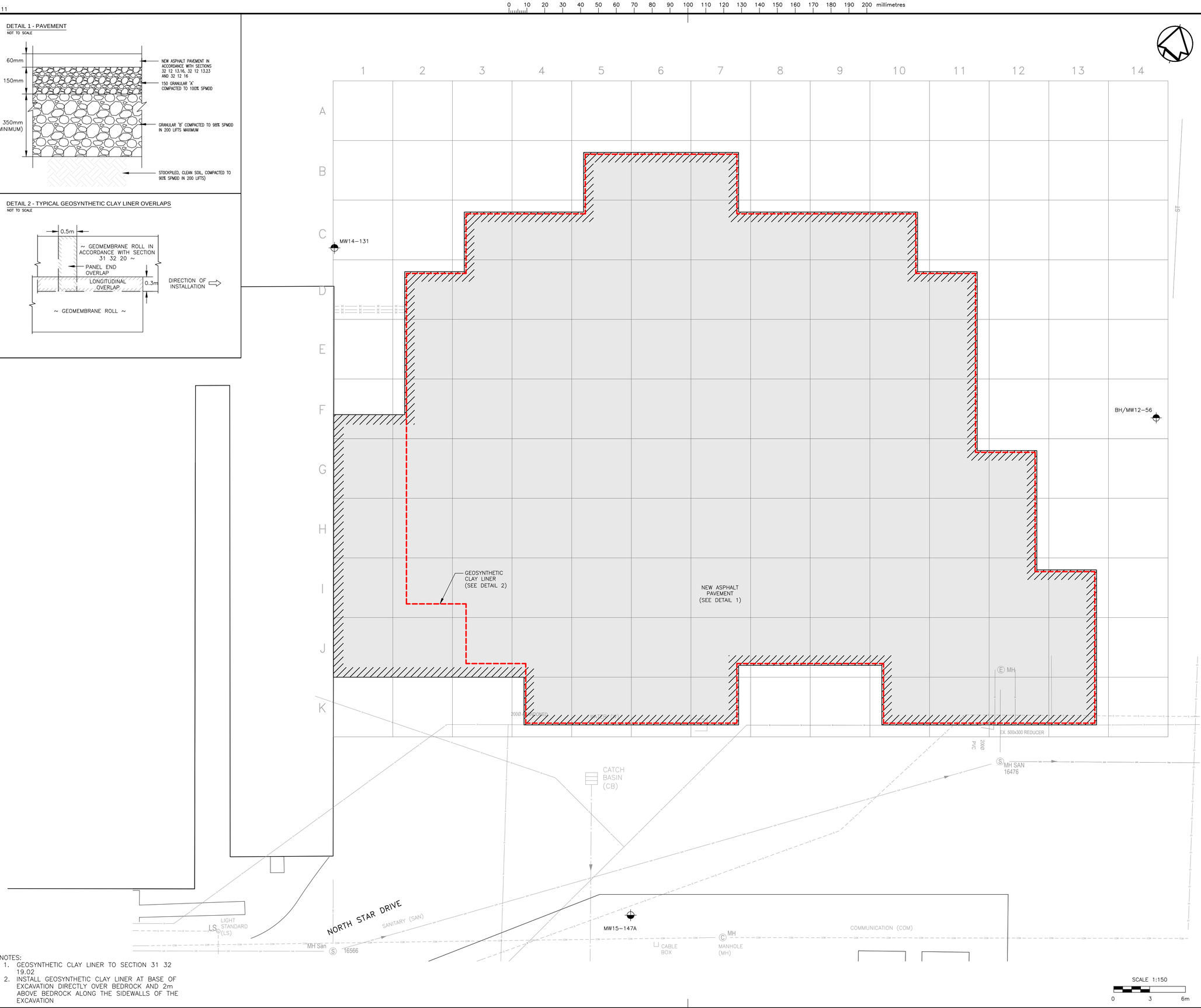
GSC-A1 DATE PLOTTED: 2017-03-31 PLOT SCALE: 1:150 CAD FILE: P:\PWGSC\CFB Trenton\643622\4.0 Execution\4.7 Working Versions\CAD_GIS\001\001A-C09_R082882.dwg

04 11

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 millimetres

DETAIL 1 - PAVEMENT
NOT TO SCALE

DETAIL 2 - TYPICAL GEOSYNTHETIC CLAY LINER OVERLAPS
NOT TO SCALE



NOTES:
1. GEOSYNTHETIC CLAY LINER TO SECTION 31 32 19.02
2. INSTALL GEOSYNTHETIC CLAY LINER AT BASE OF EXCAVATION DIRECTLY OVER BEDROCK AND 2m ABOVE BEDROCK ALONG THE SIDEWALLS OF THE EXCAVATION

SCALE 1:150
0 3 6m

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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KEY PLAN NOT TO SCALE

LEGEND
- GEOSYNTHETIC CLAY LINER
- UNDERGROUND HYDRO SERVICES
- COMMUNICATION SERVICES
- SANITARY SEWER SERVICES
- STORM SEWER SERVICES
- STREET LIGHTING UNDERGROUND SERVICES
- GAS SERVICES
- WATER SERVICES
- EXISTING BEDROCK MONITORING WELL
- EXISTING OVERBURDEN MONITORING WELL
- BACKFILL EXCAVATED AREA
- ASPHALT SURFACE

revision		date
04	ISSUED FOR TENDER	2017-05-29
03	ISSUED FOR CLIENT REVIEW	2017-03-31
02	ISSUED FOR CLIENT REVIEW	2017-03-22
01	ISSUED FOR CLIENT REVIEW	2017-02-27

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project title / titre du projet
AEC #3 AND #4 – CONTAMINATED SOIL REMOVAL
DEPARTMENT OF NATIONAL DEFENCE,
8 WING/CFB TRENTON, FORMER HANGAR 6
ASTRA, ONTARIO

drawing title / titre du dessin
SITE RESTORATION

drawn by / dessine par: AG/EM
designed by / conc par: EK
approved by / approuve par: EL
bid / offre: RM
project manager / administrateur de projets
project date / date du projet: 2017-05-19
project no. / no. du projet: R.082882.001
drawing no. / dessine no.: C-10