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November 21st, 2007

VIA COURIER

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

**Re: Enbridge Gas Distribution Inc. ("Enbridge")
Tecumseh Storage Enhancement Project
EB-2007-0888 Sombra Transmission Extension
EB-2007-0889 Vector Tie-in
EB-2007-0890 Ladysmith Loop**

Enclosed please find two paper copies of each of the above noted Leave to Construct Applications. These Applications are three of the four Applications that comprise the Tecumseh Storage Enhancement Project.

If you have any questions, please contact the undersigned.

Yours truly,

A handwritten signature in blue ink that reads 'Robert Rowe'.

Robert Rowe

Attachment

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ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15 (Schedule B);

AND IN THE MATTER OF an application by Enbridge Gas Distribution Inc. for an order granting leave to construct a natural gas transmission line and related facilities in the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton.

APPLICATION

1. The Applicant, Enbridge Gas Distribution Inc. ("EGD" or "Enbridge"), is an Ontario corporation with its head office in the City of Toronto. It carries on the business of selling, distributing, transmitting and storing natural gas within Ontario.
2. The Ladysmith Loop is one of four Leave to Construct Applications comprising the Tecumseh Storage Enhancement Project. The overall project is fully described, including timing and justification information, in Exhibit A, Tab 3 Schedule 1. The remaining three projects are the Vector Tie-In (EB-2007-0889), 16" Sombra Line Extension (EB-2007-0888) and the Storage Infill Drilling Project (EB-2007-0891, not yet filed).

3. All costs associated with the Tecumseh Storage Enhancement Project are being captured in the unregulated accounts. As such, Enbridge is not seeking a finding from the Ontario Energy Board (the "Board") related to the financial feasibility of these projects.
4. In this Application, Enbridge Gas Distribution Inc. ("EGD" or the "Company") is applying for leave to construct approximately 4.5 km of NPS 20 steel pipeline and related facilities with a maximum operating pressure of 1,440 psig (9 930 kPa). The Ladysmith Loop will commence at EGD's Tecumseh Station and is required to deliver and take away gas, in a normal operating pressure range of between 300 - 1340 psig (2 070 – 9 240 kPa), to and from the Ladysmith storage reservoir.
5. The Northeasterly end is located in the 8.09 hectare (20 acre) Compressor Site owned by EGD in Lot 19 Concession 7, for the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton. The Southwesterly end point is located in Lot 20 Concession 5, for the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton where it will connect with an existing pipeline and facilities owned by EGD for gas storage operations related to the Ladysmith Storage Pool. A detailed route is shown in Exhibit B, Tab 1, Schedule 2.
6. The construction is scheduled to occur during May through October 2008.
7. Enbridge hereby applies to the Board:

- (i) pursuant to section 90 of the *Ontario Energy Board Act, 1998*, S.O. 1998, c-15, Sched. B., for an order granting leave to construct the proposed works; and,
 - (ii) pursuant to section 97 of the *Ontario Energy Board Act, 1998*, S.O. 1998, c-15, Sched. B approval of the form of easement agreement offered to the landowner and found in Exhibit D, Tab 1, Schedule 4 herein.
- 8. Enbridge requests the Board exercise its jurisdiction pursuant to Rule 34 of the Rules of Practice and Procedure to dispose of this Application by way of written hearing. Enbridge further requests the Board dispose of this Application as soon as practicable so that, should leave be granted, construction may commence as early as May 2008.
- 9. The list of interested parties includes the owners of the land upon which the proposed facilities will be located, the County of Lambton and the other government agencies involved in the various aspects of the pipeline. The names and addresses of the affected persons are set out in Exhibit B, Tab 2, Schedules 3.
- 10. Enbridge requests that copies of all documents filed with the Board in connection with this proceeding be served on it and on its counsel, as follows:

| | |
|-------------------------------|--|
| (a) The applicant: | Patrick Hoey Director, Regulatory Affairs Enbridge Gas Distribution Inc. |
| Address for personal service: | 500 Consumers Road Toronto, Ontario M2J 1P8 |
| Mailing Address: | P. O. Box 650 Scarborough, Ontario M1K 5E3 |

Telephone: (416) 495-5555
Fax: (416) 495-6072
E-Mail: patrick.hoey@enbridge.com

(b) The Applicant's counsel: Scott Stoll
Aird & Berlis LLP


Address for personal service
and mailing address: Suite 1800, Box 754
Brookfield Place
181 Bay Street
Toronto, Ontario
M5J 2T9

Telephone: (416) 865-4703
Fax: (416) 863-1515
E-Mail: ssoll@airdberlis.com

DATED November 20, 2007 at Toronto, Ontario.

ENBRIDGE GAS DISTRIBUTION INC.
By its counsel

AIRD & BERLIS LLP



Scott Stoll

List of Interested Parties - Ontario Pipeline Coordinating Committee Members (OPCC)

| | |
|---|---|
| <p>Ms. Zora Crnojacki Ontario Energy Board P.O. Box 2319 2300 Yonge Street, 26th Floor Toronto, ON M4P 1E4</p> <p>Tel: 416-440-8104 Fax: 416-440-7656 Email: Zora.Crnojacki@oeb.gov.on.ca</p> | <p>Ms. Donna Mundie Ministry of Agriculture, Food and Rural Affairs 1 Stone Road West Guelph ON N1G 4Y2</p> <p>Tel: (519) 826-3120 Fax: (519) 826-3109 Email: donna.mundie@omafra.gov.on.ca</p> |
| <p>Mr. Michael Johnson Manager, Operations Unit Heritage and Libraries Branch Ministry of Citizenship, Culture & Recreation 400 University Avenue, 4th floor Toronto ON M7A 2R9 Tel:(416) 314-7144 Fax: 314-7175 Email: michael.johnson@ontario.ca</p> | <p>Mr. Doug Peeling Ministry of Transportation 301 St. Paul Street, 2nd floor St. Catharines ON L2R 7R4</p> <p>Tel: (905) 704-2916 Fax: (905) 704-2481 Email: doug.peeling@mto.gov.on.ca</p> |
| <p>Mr. Oscar Alonso Technical Standards and Safety Authority 3300 Bloor St. W., 4th Floor Etobicoke ON M8X 2X4</p> <p>Tel: (416) 325-1650 Fax: (416) 326-8248 Email : oalonso@tssa.org</p> | <p>Ms. Sharon Rew Ministry of Natural Resources Land Use and Environmental Planning Section Policy and Planning Coordination Branch 300 Water Street, Peterborough ON K9J 8M5 Tel: (705) 755-5870 Fax: (705) 755-1971 Email: sharon.rew@ontario.ca</p> |
| <p>Mr. Usman Ahmed Provincial Planning and Environmental Services Branch Ministry of Municipal Affairs 777 Bay Street, 14th floor Toronto ON M5G 2E5 Tel: 585-7181 Fax: 585-4245 Email: usman.ahmed@ontario.ca</p> | <p>Mr. Graham Martin Ontario Realty Corporation 77 Wesley Street, West 11th floor, Ferguson Block Toronto ON M7A 1N3 Tel: (416) 326-9792 Email: graham.martin@orc.gov.on.ca</p> |

List of Interested Parties - Ontario Pipeline Coordinating Committee Members (OPCC)

| | |
|---|---|
| <p>Mr. Sing-Gin Louie Ministry Energy, Science and Technology Oil and Gas Section 3th Floor, 880 Bay Street Toronto ON M7A 2C1</p> <p>Tel: 325- 6836 Fax: 325-6981 Email: sing-gin.louie@est.gov.on.ca</p> | <p>MOE Regional Contact-Northern Ms. Kathy McDonald Supervisor, APEP 199 Larch Street, Suite 1101 Sudbury ON P3E 5P9</p> <p>Tel: (705) 564-3247 Fax: (705) 564-4180 Email: kathy.mcdonald@ontario.ca</p> |
| <p>MOE Regional Contact- Eastern Mr. Brian Kaye Supervisor, APEP P.O.Box 820 133 Dalton Ave. Kingston ON K7L 4X6 Tel: (613) 549-4000 Ext. 2624 Fax: (613) 548-6908 Email: brian.kaye@ontario.ca</p> | <p>MOE Regional Contact- Southwestern Mr. Mike Parker Supervisor, APEP 659 Exeter Road, 2nd Floor London ON N6E 1L3 Tel: (519) 873-5041 Fax: (519) 873-5020 Email: mike.parker@ontario.ca</p> |
| <p>MOE Regional Contact- West Central Mr. Barry Duffey Supervisor, APEP 119 King St. West, 12th Floor Hamilton ON L8P 4Y7 Tel: (905) 521-7705 Fax: (905) 521-7820 Email: Barry.Duffey@ontario.ca</p> | <p>MOE Regional Contact- Central Mr. Ernie Hartt Supervisor, APEP Ministry of the Environment 5775 Yonge Street, 8th Floor North York ON M2M 4J1 Tel: (416) 326-4835 Fax: (416) 325-6345 Email: ernie.hartt@ontario.ca</p> |

INTERESTED PARTIES - ONTARIO PIPELINE COORDINATING COMMITTEE
MEMBERS (OPCC)

| | |
|--|--|
| <p>Mr. Usman Ahmed Provincial Planning and Environmental Services Branch Ministry of Municipal Affairs 777 Bay Street, 14th floor Toronto ON M5G 2E5 Tel: 585-7181 Fax: 585-4245 usman.ahmed@ontario.ca</p> | <p>Mr. Graham Martin Ontario Realty Corporation 77 Wesley Street, West 11th floor, Ferguson Block Toronto ON M7A 1N3 Tel: (416) 326-9792 graham.martin@orc.gov.on.ca</p> <p>Mr. Sing-Gin Louie Ministry Energy, Science and Technology Oil and Gas Section 3th Floor, 880 Bay Street Toronto ON M7A 2C1 Tel: 325- 6836 Fax: 325-6981 email: sing-gin.louie@est.gov.on.ca</p> |
| | <p>MOE Regional Contact-Northern Ms. Kathy McDonald Supervisor, APEP 199 Larch Street, Suite 1101 Sudbury ON P3E 5P9 Tel: (705) 564-3247 Fax: (705) 564-4180 email: kathy.mcdonald@ontario.ca</p> |
| <p>MOE Regional Contact- Eastern Mr. Brian Kaye</p> | <p>MOE Regional Contact- Southwestern Mr. Mike Parker</p> |

INTERESTED PARTIES - ONTARIO PIPELINE COORDINATING COMMITTEE
MEMBERS (OPCC)

| | |
|---|--|
| <p>Supervisor, APEP P.O.Box 820 133 Dalton Ave. Kingston ON K7L 4X6</p> <p>Tel: (613) 549-4000 Ext. 2624 Fax: (613) 548-6908 email: brian.kaye@ontario.ca</p> | <p>Supervisor, APEP 659 Exeter Road, 2nd Floor London ON N6E 1L3</p> <p>Tel: (519) 873-5041 Fax: (519) 873-5020 email: mike.parker@ontario.ca</p> |
| <p>MOE Regional Contact- West Central Mr. Barry Duffey Supervisor, APEP 119 King St. West, 12th Floor Hamilton ON L8P 4Y7</p> <p>Tel: (905) 521-7705 Fax: (905) 521-7820 email: Barry.Duffey@ontario.ca</p> | <p>MOE Regional Contact- Central Mr. Ernie Hartt Supervisor, APEP Ministry of the Environment 5775 Yonge Street, 8th Floor North York ON M2M 4J1</p> <p>Tel: (416) 326-4835 Fax: (416) 325-6345 email: ernie.hartt@ontario.ca</p> |

INTERESTED PARTIES FOR THE 2007 ALTERNATE ROUTE

| | |
|--|---|
| <p>Niagara Gas Transmission Limited P.O. Box 650 Scarborough, ON M1K 5E3</p> <p>Att: Jamie Milnar Tel: (416) 495-4961</p> | <p>Enbridge Gas Distribution Inc. 3595 Tecumseh Road Mooretown, ON N0N 1M0</p> <p>Att: Terry Chupa Tel: (416) 519-862-6008</p> |
| <p>Facilities and Real Estate Hydro One Networks Inc. 185 Clegg Road, PO Box 4300 Markham, ON L6G 1B7</p> <p>Att: Easement Department Tel: 1-800-387-1946</p> | <p>Legal Aid Ontario 375 University Avenue, Suite 404 Toronto, ON M5G 2G1</p> <p>Att: Donna English Tel: (416) 979-1446 ext. 6469</p> |
| <p>Polysar Lambton Credit Union Limited 2394 Jane Street Brigden, ON N0N 1B0</p> <p>Att: Mark Hoffman Tel: (519) 864-1026</p> | <p>Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1</p> <p>Att: Bev Wilton Tel: (519) 436-4600 ext. 5403</p> |
| <p>Farm Credit Canada 1133 St. George Boulevard, Suite 200 Moncton, New Brunswick E1E 4E1</p> <p>Att: Donna Lacenaire Tel: (506) 851-6595</p> | <p>St. Clair Township 1155 Emily Street Mooretown, ON N0N 1M0</p> <p>Att: John DeMars Tel: (519) 867-2125</p> |
| <p>912176 Ontario Ltd., a wholly owned subsidiary of Enbridge Gas Distribution Inc. PO Box 650 Scarborough, ON M5K 5E3</p> <p>Att: Bill Coldicott Tel: (416)753-6952</p> | <p>Kimcor Farms Ltd. 1519 Courtright Line, Brigden, ON N0N 1B0</p> <p>Att: Art Eyre Tel: (519) 864-1364</p> |

| | |
|---|---|
| Eugene Robbins Carine Robbins R.R. #1 Mooretown, ON N0N 1M0 Tel: (519) 864-1412 | The Corporation of the County of Lambton 789 Broadway Street, Box 3000 Wyoming, ON N0N 1T0 Att: Glen Millar Tel: (519) 845-0809 ext. 311 |
| Allan Long Sharon Long R.R. #1 Mooretown, ON N0N 1M0 Tel: (519) 867-2624 | Claire Robbins Helen Robbins 2969 Courtright Line Courtright, ON N0N 1H0 Tel: (519) 864-1275 |
| Allan Long Brian Long R.R. #1 Mooretown, ON N0N 1M0 Tel: (519) 867-2624 | Cyriel Braet Lisa Braet R.R. #1 Mooretown, ON N0N 1M0 Tel: (519) 431-0707 |

PROJECT DESCRIPTION AND JUSTIFICATION

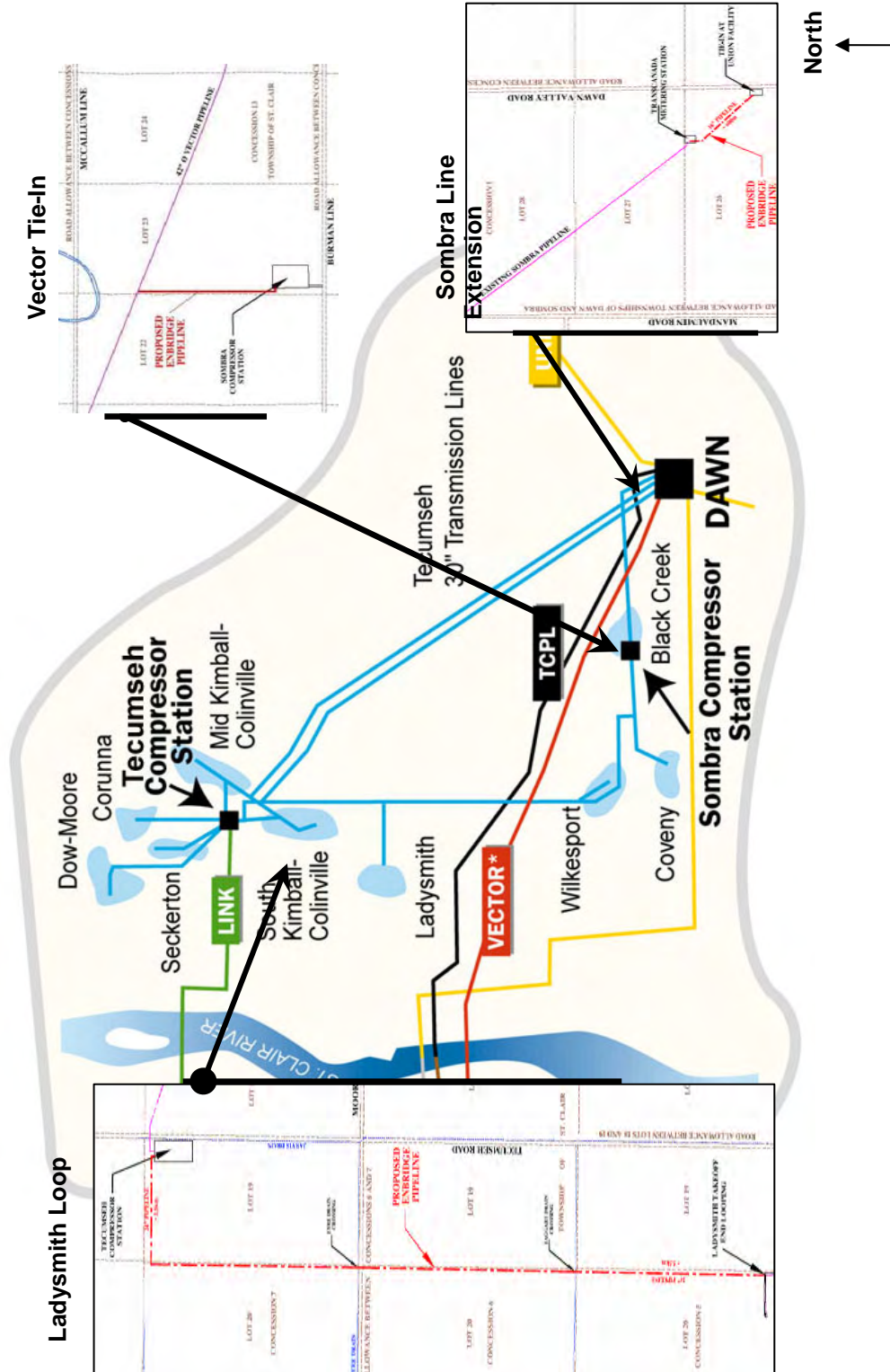
1. Enbridge Gas Distribution Inc. ("EGD" or the "Company") is filing a series of Leave to Construct applications which together make up the Tecumseh Storage Enhancement Project. The Tecumseh Storage Enhancement Project described in these applications is required to meet a demand for high deliverability storage services in Ontario. The high deliverability storage services which are provided by these projects will be used to meet the needs of power generators and marketers in Ontario. These services are being made available due to the Ontario Energy Board's (the "Board") decision in EB-2005-0551 Natural Gas Electricity Interface Review ("NGEIR"), which recognized a market need for high deliverability services.
2. The need for these high deliverability storage services arises from recent market demands, including the needs of gas-fired generators. These market demands were highlighted in the Board's NGEIR proceeding. In this proceeding the Board investigated; a) more frequent nomination windows as a service to gas-fired generators; b) firm high deliverability from storage as a service to gas-fired generators; and, c) whether to refrain in whole or in part from regulating the rates charged for the storage of gas in Ontario.
3. In the November 7, 2006 NGEIR Decision, the Board recognized the need for new high deliverability storage services, but indicated that it would refrain from regulating these new services. As a result, the new high deliverability storage services facilitated by the Tecumseh Storage Enhancement Project will be unregulated in accordance with the NGEIR Decision that stated "The Board will refrain from regulating the rates for new storage services, including Enbridge's high deliverability service from the Tecumseh Storage Enhancement Project".¹

1. Ontario Energy Board, EB-2005-0551 Decision, pg.79

4. EGD's new high deliverability storage service will support the balancing needs of gas fired generators of electricity. It is EGD's intent that the high deliverability storage service will be available for gas fired generation facilities currently under construction and due to be on-line in 2008. Timely development of the pipeline facilities that are part of the Tecumseh Storage Enhancement Project is critical to ensure the in-service dates for the high deliverability contracts can be achieved. EGD has signed contracts to accept high deliverability gas beginning in spring 2008 from various contracted parties at the following delivery and receipt points; Union Gas Limited (Dawn), TransCanada Pipeline Limited ("TCPL"), Niagara Gas Transmission Limited Link Pipeline ("Niagara Link") and Vector Pipeline Limited Partnership ("Vector")
5. EGD's proposed new high deliverability storage service was offered to the market in an open season process which was announced on November 28, 2006. The deliverability and injection services offered were up to 212,460 GJ/d (approximately 200 mmcf/d) which could be ratcheted or unratcheted injection and withdrawal service. In addition, the Company was offering multiple receipt and delivery points (TransCanada Dawn, Union Dawn, Vector and Niagara Link) as part of this open season. Also in this open season, bidders could elect to bid for enhanced nomination windows which would match the Union Gas Limited. offering of 13 total nomination windows which was discussed in the NGEIR proceeding. The open season closed with all interested bidders returning confidential bids to EGD by December 22, 2006.
6. EGD reviewed the bids and awarded capacity to the successful bidders on January 26, 2007. Contract negotiations were then finalized and contracts were executed with the successful bidders. The final capacity awarded through the open season was approximately 2,900,000 GJ (2.7 Bcf) and the deliverability awarded through the open season remains 212,416 GJ/d (200 mmcf/d.)

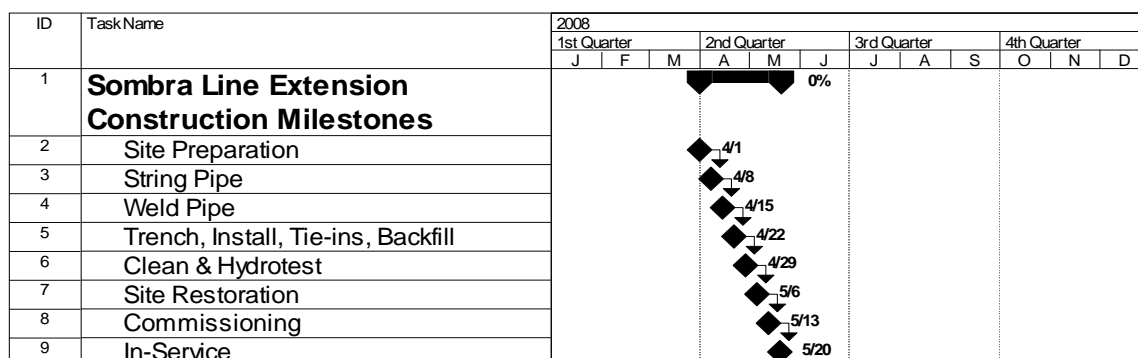
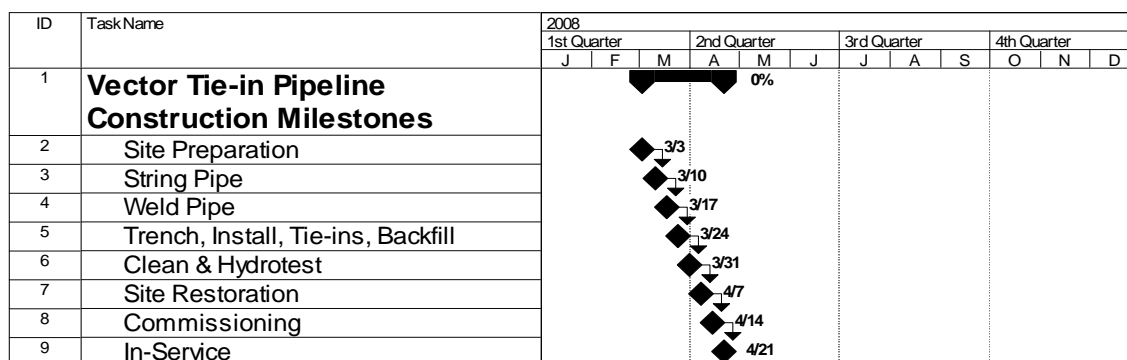
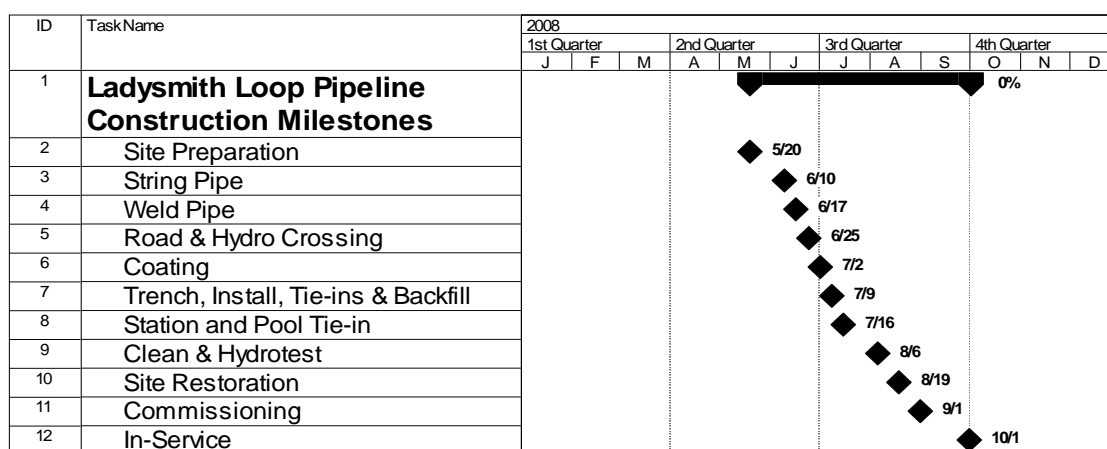
7. The Tecumseh Storage Enhancement Project, which will enable EGD to offer this new high deliverability storage service, is comprised of four distinct Leave to Construct Applications.
8. Three pipelines segments are being proposed as part of the Tecumseh Storage Enhancement Project and together will enable a high deliverability storage service made up of 2,900,000 GJ of new, incremental storage and 212,460 GJ/day in deliverability. The three pipeline segments being proposed will be addressed under separate docket numbers; a) Vector Tie-In (Docket # EB-2007-0889), b) Sombra Line Extension (Docket # EB-2007-0888) and c) The Ladysmith Loop (Docket # EB-2007-0890). Each of these segments is a standalone pipeline functioning independently of one another but once incorporated into the Tecumseh storage system will provide the majority of the overall enhancement to storage deliverability.
9. A fourth application titled Storage Infill Drilling Project (Docket # EB-2007-0891) requesting leave to construct storage wells will represent the last component of EGD's Tecumseh Storage Enhancement Project. The infill drilling project schedule is longer relative to the pipeline projects because it includes reservoir modeling and development as well as well drilling and construction. As a result of the longer timeline, this application is targeted to be filed in the first quarter of 2008. Similar to the pipelines included in the enhancement project, the proposed storage wells will function independently but will serve as another contributing element to the overall enhancement of EGD's storage deliverability.
10. Figure 1, on the next page, shows a summary the proposed build program for the various components of the Tecumseh Storage Enhancement Project.

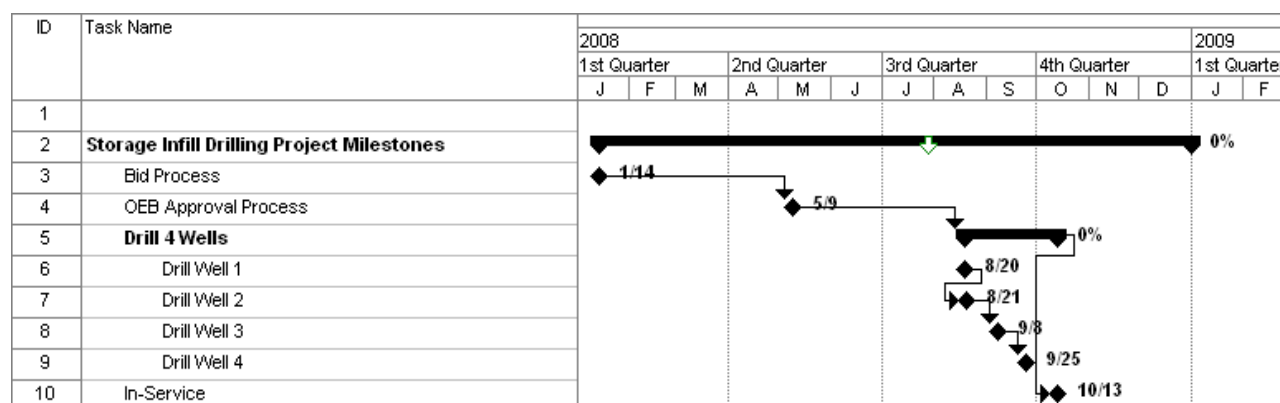
Figure 1. Summary of Proposed Build Program



11. Figure 2, set out below provides the project schedules for the various components of the Tecumseh Storage Enhancement Project.

Figure 2. Project Milestone Schedules





12. Consultations with affected landowners and the public have taken place with regards to the three pipeline projects, the Vector tie-in, Sombra pipeline extension and the Ladysmith Loop, mentioned above. The form of the consultations has been different for the various projects.

13. For the Ladysmith Loop project a public consultation was part of the Environmental Assessment conducted by Stantec Consulting Limited, see Exhibit B, Tab 2, Schedule 3 for reference. This consultation included a Public Open House on March 21, 2007 where details of the project were made available to interested parties. As part of the Environmental Assessment for the Ladysmith Loop, Indian and Northern Affairs Canada was contacted regarding the status of lands within the Study Area for the assessment. Indian and Northern Affairs Canada had been sent a letter to notify them of the public open house which took place.

14. Contact has been made with and information was sent by EGD personnel to the offices of the Bkwejwanong Territory (Walpole Island) and to the Chippewas of

Aamjiwnaang (Sarnia). This package of information included general information of the projects and copies of the Environmental Assessment for the Ladysmith Loop project and the environmental screenings for the Vector tie-in and Sombra pipeline extension. Invitations have been sent as part of the package to both groups, to meet with EGD personnel to discuss any aspects of these projects. Contact with the Bkwejwanong Territory and to the Chippewas of Aamjiwnaang will again take place associated with the environmental assessment for the Storage Infill Drilling project when the well locations are known.

15. For the Vector tie-in and the Sombra pipeline extensions, a Public Open House was not held due to the short length of the pipelines (800 metres and 340 metres) and the very small number of landowners affected. There is only one affected land-owner for the Vector tie-in project and no identifiable environmental concerns with the route (see Environmental Screening Report at Exhibit B, Tab 2, Schedule 2 in EB-2007-0889). There are two landowners (Union Gas Limited and TransCanada Pipelines Limited) for the Sombra Pipeline Extension, and no other landowners. In addition, there are no identifiable environmental concerns with the Sombra pipeline route (see Environmental Screening Report at Exhibit B, Tab 2, Schedule 2 in EB-2007-0888). Meetings and consultations have been held with the affected landowners for these projects and there are no outstanding concerns.
16. Public consultations will be undertaken in connection with the application to be made for the Storage Infill Drilling project, but these consultations have not yet taken place as the well drilling locations are not finalized at this time. Contact with the Bkwejwanong Territory and to the Chippewas of Aamjiwnaang will again take place as part of the public consultations for the Storage Infill Drilling project.
17. Consistent with the NGEIR Decision, these projects that make up the Tecumseh Storage Enhancement Project are being funded by EGD's shareholders and will not

become part of EGD's rate base. All costs associated with these projects are being captured in the unregulated accounts and no costs of the project are charged to regulated utility accounts. As such, these Applications do not include an economic feasibility analysis and the Company is not seeking a finding from the Board related to the financial feasibility to these projects. These unregulated services will have no impact on the regulated utility storage service which the Company currently provides.

LADYSMITH LOOP PROJECT DESCRIPTION

1. The Ladysmith Loop is one of four Leave to Construct Applications comprising the Tecumseh Storage Enhancement Project. The overall project is fully described, including timing and justification information, in Exhibit A, Tab 3, Schedule 1.
2. In this Application, EGD is applying for leave to construct approximately 4.5 km of NPS 20 steel pipeline ("Ladysmith Loop") with a maximum operating pressure of 1,440 psig (9 930 kPa). The Ladysmith Loop will commence at EGD's Tecumseh Station and is required to deliver and take away gas, in a normal operating pressure range of between 300 -1340 psig (2 070 to 9 240 kPa), to and from the Ladysmith storage reservoir. The need for and nature of this pipeline is discussed at Exhibit A, Tab 3, Schedule 1, under the heading "Project Description and Justification".
3. In 1993, an Environmental and Socio-Economic Impact Assessment ("EA") was completed by an independent environmental consultant, Stantec Consulting Ltd. ("Stantec"), for a proposed NPS 16 pipeline connecting the Ladysmith Reservoir and the Tecumseh Compressor Station. The EA identified a Preferred 1993 Route ("1993 Preferred Route") which was located within a hydro easement and traveled through a poorly drained woodlot along the southern portion of the route. Also in 1993, EGD obtained an 8 m wide easement from a number of landowners ("1993 Easement") for an NPS 16 pipeline that followed the 1993 Preferred Route within the hydro easement. The 1993 Easement also ran through the woodlot located at the south end of this route. The NPS 16 line proposed to be placed in the 1993 Easement was

never constructed due to changes with EGD's gathering and transmission pipeline plan.

4. The 1993 Easement has been maintained and remains as a binding agreement with the respective landowners in 2007. It should be noted that the 1993 Easement was an agreement for an NPS 16 pipeline which does not meet the current needs of the Ladysmith Loop. The 1993 Easement was also only an 8 metre wide easement which is very restrictive for the purposes of construction and future maintenance and operations.
5. In 2007, Stantec was retained to re-evaluate and update the 1993 EA in connection with the Tecumseh Storage Enhancement Project. A copy of Stantec's revised report is filed as Exhibit B, Tab 2, Schedule 3.
6. The revised report identified a 2007 Preferred Route that parallels the 1993 Preferred Route, 302 m to the east. Subsequently, Stantec has also identified a Final Route ("2007 Alternate Route"), which is located 15m to the west of the 1993 Preferred Route and is also described in Stantec's revised report.
7. Stantec's revised EA report has been issued to the Ontario Pipeline Coordinating Committee ("OPCC") for their review as part of the Board's Leave to Construct process.
8. The Aerial Photograph at Exhibit B, Tab 1, Schedule 2, illustrates the Ladysmith Loop Routes and Easement, including a detailed view of the 1993 Preferred Route, the 1993 Easement, the 2007 Preferred Route, and the 2007 Alternate Route.

9. The reasons that caused Stantec to establish the 2007 Preferred Route, which is a different route from the 1993 Preferred Route, include the fact that the woodlands, located at the south end of the original 1993 Preferred Route, are now designated as a significant woodlot by the County of Lambton. In addition, the 2007 Preferred Route travels over land that allows for easier construction and operation due to the sufficient offset from the hydro easement, reducing the need for stray current mitigation. Finally, Stantec found that the 2007 Preferred Route is situated within land with better drainage characteristics and fewer trees requiring removal compared to the 1993 Preferred Route.
10. Stantec has stated that either the 2007 Preferred Route, the 1993 Preferred Route, or the 2007 Alternate Route are environmentally acceptable with the implementation of the standard mitigation and protective measures. The 2007 Alternate Route is preferred by the landowners and is located 15 metres west of the 1993 Preferred Route, and immediately west of a Union Gas pipeline easement.
11. The proposed 2007 Alternate Route Easement is 10 m wide and follows a slightly different route from the 1993 Easement because it is placed outside of the hydro easement to reduce the levels of stray current on the proposed pipeline. Although, stray current mitigation will still be required, the new easement location will reduce the overall risk to construction and operations personnel installing or working on the pipeline. Locating the proposed pipeline outside of the hydro easement eliminates the need for protecting the line from heavy loading caused by large hydro vehicles within the hydro easement.

Table 1: Elements Requiring Mitigation on the 2007 Alternate Route

| | Problem Element | Mitigation |
|----|---|---|
| 1. | Stray current from hydro lines | <ul style="list-style-type: none"> • Electrical grounding of pipeline will be performed during construction activities such as welding etc. • Electrical grounding of construction and operation & maintenance vehicles along easement. |
| 2. | Construction within Significant Woodlot | <ul style="list-style-type: none"> • Requirement to follow County and Township Official Plan which states that twice the area of tree cover removed must be replaced |
| 3. | Poorly Drained Land | <ul style="list-style-type: none"> • Pipeline trench to be kept dry by pumping water from the trench to an alternate location • Steel plating wet sections of the easement will allow construction and operating vehicles to access required locations along the easement • Pipe weights will be included in pipeline construction to counter pipeline buoyancy associated with a high water table |

12. Similar to the 1993 Easement, the 2007 Alternate Route travels through a woodlot identified as significant by Lambton County. Lambton County has indicated that it will consider applications for pipeline construction within the woodlot. The County has stated that where it is necessary to broach the woodlot, Subsection 7.73 of the County Official Plan and Sections 16.2.6 and 16.2.7 of the local St. Clair Township Official Plan must be followed including tree cover replacement equal to twice the tree cover that is removed. EGD will abide by this requirement.

13. Where possible and practical EGD will mitigate the potential affects of constructing in the poorly drained area in parts of the 2007 Alternative Route by keeping the trench dry, using steel plating to move vehicles in and out of the easement, and by reducing any pipeline buoyancy associated with the high water table using pipe weights.
14. Input from the public was sought during the route selection process by way of a public open house held on March 21, 2007 as part of the 2007 EA study. A strong preference was demonstrated by landowners to the 1993 Preferred Route during the public open house.
15. Over the months following the open house, EGD entered into discussions with landowners along the 2007 Preferred Route. A formal easement negotiation meeting was held on August 20, 2007 between EGD and the affected landowners concerning the 2007 Preferred Route. Some of the affected landowners made it clear that they do not favour the 2007 Preferred Route, and are opposed to the routing going through their properties. While EGD and the landowners did make a great deal of progress in negotiating and agreeing upon technical aspects of the pipeline, if it were to be built, the overall opposition to the routing remained. At the end of these negotiations, no agreement had been reached on significant issues, including compensation.
16. During the August 2007 meeting, a couple of the landowners suggested that EGD select a route that follows the 1993 Preferred Route. Based on the landowner feedback regarding the preference of an alternative pipeline route relative to the 2007 Preferred Route, EGD undertook to assess the 2007 Alternate Route, located 15 metres west of the 1993 Preferred Route,

with the understanding that the negative issues identified with that corridor would have to be mitigated.

17. Discussions with landowners on the 2007 Alternate Route (who are a different group from the 2007 Preferred Route) were initiated in September 2007 to assess their acceptance of a pipeline easement.
18. The affected landowners along the 2007 Alternative Route have been receptive to the Ladysmith Loop being built along that route, and have entered into Agreements to Grant Easements with EGD with the exception of the Corporation of the County of Lambton. Although the County of Lambton has agreed to the proposed pipeline route in principle, the County's timing for final approval of the proposal by County Council falls in early December, 2007. Once the Agreement to Grant Easement with the County of Lambton has been signed it will be reported to the Board.
19. As a result of the fact that there is landowner acceptance of the 2007 Alternate Route, and the fact that EGD construction standards will be applied to the Ladysmith Loop along that route, minimizing environmental impacts, EGD is seeking approval to use the 2007 Alternate Route.

Table 2: LANDOWNER EASEMENT AGREEMENT STATUS

| LANDOWNER NAME | LOT | CONC. | PART OF LOT | STATUS |
|--|-----|-------|---|--|
| 912176 Ontario Ltd., a wholly owned subsidiary of Enbridge Gas Distribution Inc. | 19 | 7 | North 20 acres of East $\frac{1}{4}$ | No easement required because owner is a wholly owned subsidiary of Enbridge |
| Robbins, Eugene and Robbins, Carine Olga | 19 | 7 | West $\frac{1}{2}$ of East $\frac{1}{2}$ and the Southerly 30 acres of East $\frac{1}{4}$ | Easement and Temporary Working Rights Acquired |
| Long, Allan Bruce and Long, Sharon Louise | 19 | 7 | East $\frac{1}{2}$ of West $\frac{1}{2}$ | Easement and Temporary Working Rights Acquired |
| Long, Allan and Long, Brian | 19 | 7 | West $\frac{1}{2}$ of West $\frac{1}{2}$ | Easement and Temporary Working Rights Acquired |
| Braet, Cyriel and Braet, Lisa | 20 | 7 | East $\frac{1}{2}$ | Easement and Temporary Working Rights Acquired |
| Robbins, Claire and Robbins, Helen | 20 | 6 | East $\frac{1}{4}$ | Easement and Temporary Working Rights Acquired |
| The Corporation of the County of Lambton | 20 | 5 | North $\frac{1}{2}$ | Proposal supported by County staff and is to be submitted to Council for approval in December 2007 |
| Kimcor Farms Ltd. | 20 | 5 | South $\frac{1}{2}$ | Easement and Temporary Working Rights Acquired |

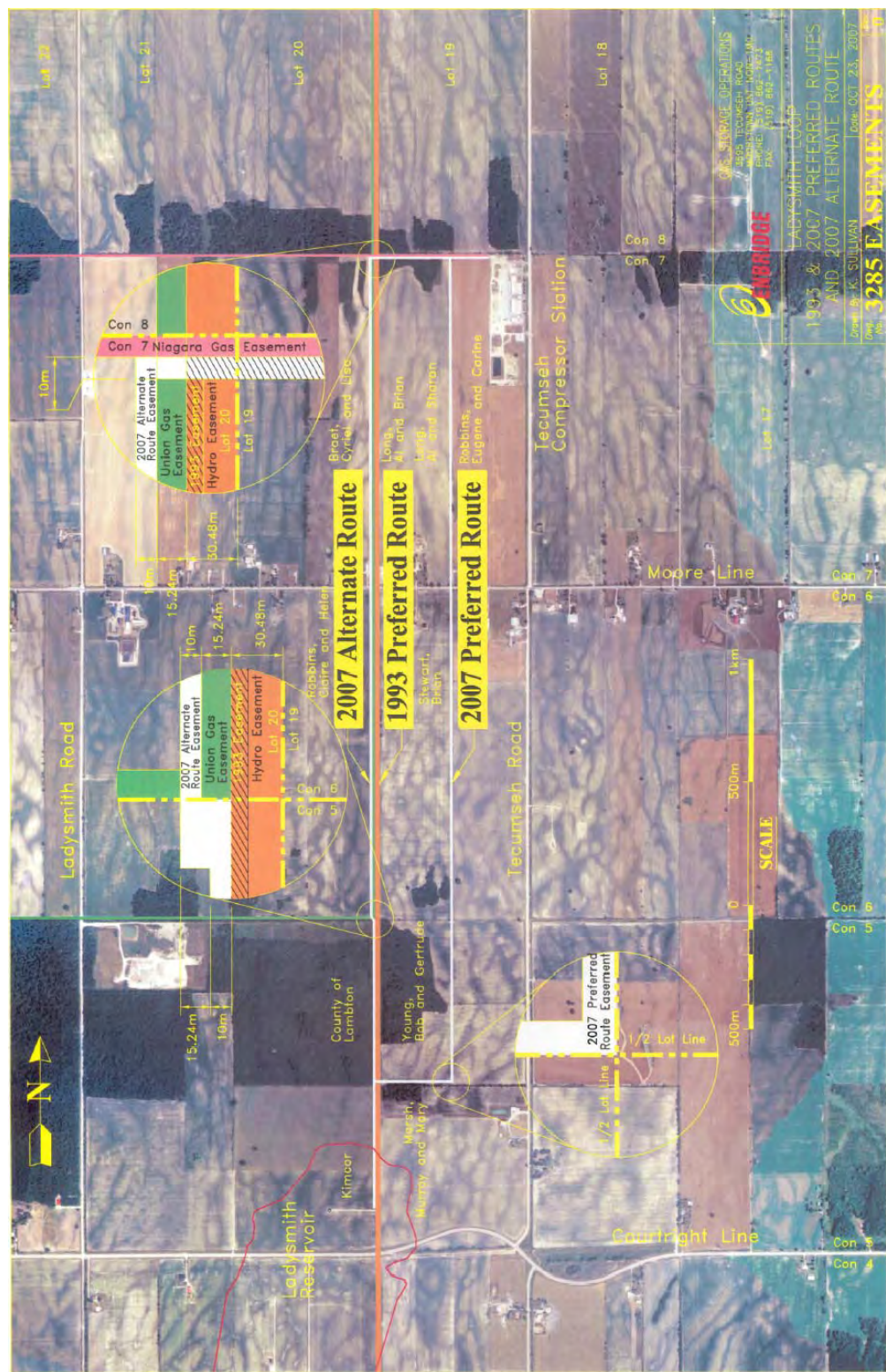
20. The agreement to grant the permanent easement includes a provision to enter into the transfer of easement upon completion of the pipeline installation.

PREFERRED ROUTE

1. The reasons why the 2007 Preferred Route was established are explained herein and in the 2007 EA by Stantec Consulting Ltd which can be found at Exhibit B, Tab 2, Schedule 3.
2. The EA also sets out the 2007 Alternate Route, and the reasons why it is also acceptable.
3. Negotiations with landowners along the 2007 Preferred Route have not been successful, and some affected landowners have indicated that they do not want the pipeline running on that route across their properties.
4. On the other hand, negotiations with landowners along the 2007 Alternate Route have been successful, leading the Company to propose to use that route for the construction of the Ladysmith Loop.
5. The 2007 Alternate Route is depicted on an aerial photograph titled "the Summary of the Ladysmith Loop Routes and Easement" referenced as Figure 1 in Exhibit B, Tab 1, Schedule 2, and is described as follows.
6. The entire route is located within the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton.
7. The Northeasterly end is located in the 8.09 hectare (20 acre) Compressor Site owned by EGD in Lot 19, Concession 7, for the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton.

8. The Southwesterly end point is located in Lot 20, Concession 5, for the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton where it will connect with an existing pipeline and facilities owned by EGD for gas storage operations related to the Ladysmith Storage Pool.
9. The 2007 Alternate Route, abuts the 1993 Preferred Route as it exits the EGD Compressor Site at its Northwest corner and then proceeds west along the South side of, and parallel with the southerly limit of the 1993 Preferred Route in Lot 19, Concession 7. The route then crosses the dividing line between Lots 19 and 20 in Concession 7 and then travels across a 30.48 metre (100 foot) wide Hydro One Easement followed by a crossing of a 15.24 metre (50 foot) Union Gas Easement.
10. The 2007 Alternate Route will then turn at 90 degrees and travel southerly along the west side of, and parallel with the Union Gas easement in Lot 20 in Concessions 6 and 7, to southerly limit of Lot 20, Concession 6 at a distance of 15m west of the 1993 Preferred Route.
11. It will then continue southerly along the west side of, and parallel with the Hydro One easement in Lot 20, Concession 5, immediately adjacent to the 1993 Preferred Route, to the point where it intersects with an existing NPS 16 pipeline owned by EGD for gas storage operations related to the Ladysmith Storage Pool.

FIGURE 1. SUMMARY OF THE LADYSMITH LOOP ROUTES AND EASEMENT



ENVIRONMENTAL IMPLEMENTATION PLAN

1. Construction will be conducted in accordance with the EGD Contract Specifications, the Environmental Management Manual for Environmental Protection during Pipeline Construction, and the recommendations in the EA Report for the proposed Ladysmith Loop pipeline as shown in Exhibit B, Tab 2, Schedule 3. Any additional requirements resulting from the final permitting, or the Board's Conditions of Approval will be incorporated into the Environmental Implementation Plan where necessary.
2. The Environmental Implementation Plan will incorporate recommended mitigation measures for the environmental issues and concerns associated with the proposed works and will be communicated to the construction contractor prior to the start of construction. A qualified Environmental Inspector will be available to assist the Project Manager in ensuring that environmental conditions contained in the Board's Conditions of Approval are followed and that commitments made to the public, landowner, and agencies are honoured. The Environmental Inspector and Project Manager will also ensure that any unforeseen environmental circumstances that arise before and during construction are appropriately addressed.
3. Through the use of the procedures outlined above, it is expected that environmental impacts resulting from construction of the Ladysmith Loop Pipeline will be negligible.

**TECUMSEH COMPRESSOR
STATION TO LADYSMITH
NATURAL GAS STORAGE POOL
ENVIRONMENTAL ASSESSMENT
UPDATE**

File No. 160960210



Prepared for:

Enbridge Gas Storage Operations
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November 2007

Executive Summary

Enbridge Gas Storage Operations ("Enbridge") is proposing to install a 20-inch (508 mm) Nominal Pipe Size (NPS) diameter steel pipeline to meet increased demand for natural gas storage capacity. The approximate length of the pipeline is 4.5 km. In 1993 ESG International Inc. (now Stantec Consulting Ltd. ("Stantec")) prepared an Environmental Assessment (EA) for this pipeline for Tecumseh Gas Storage (now Enbridge). Due to changing demands for natural gas supply the proposed pipeline was never constructed. In 2006, Enbridge reactivated the Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool Project ("the Project") and retained Stantec to re-evaluate and update the 1993 EA. Stantec conducted public and agency meetings, landowner surveys and updated resource data to produce the "Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool Environmental Assessment Update - 2007".

Stantec's 2007 EA Update incorporates the planning and information requirements of the Ontario Energy Board's (OEB) Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario Fifth Edition (2003) (*OEB Guidelines, (2003)*). It also outlines key changes made to the Guidelines and merges the new and old information in a Guideline compliant EA document. The EA Update will be filed as part of Enbridge's application to the OEB for Leave to Construct for the Project. If the application is approved construction is scheduled to commence in the summer of 2008.

The EA describes the process used to identify and evaluate route alternatives for the proposed pipeline, in order to select a Final Route. The EA also considers the environmental and socio-economic setting within the Study Area, and the potential environmental and socio-economic effects of the proposed pipeline. Mitigation measures are recommended to minimize any potential impacts.

In preparing the EA, input was received from interested parties and stakeholders through a public consultation program, including local, provincial, and federal government agencies, and residents within or close to the Study Area. This information provided important data concerning local environmental and socio-economic features. Stantec has considered this information during route selection to address the potential environmental effects of the proposed pipeline and recommend appropriate mitigation measures.

A Study Area was established, based on a general review of the area and preliminary assessment of routing opportunities and constraints between the Project endpoints. The principal objective in defining the Final Route was to select an acceptable route in consideration of socio-economic, environmental, technical, and economic factors.

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The route that was preferred in 1993 was analyzed by Enbridge and Stantec. In 2007 a new route alignment was identified using published information, field and aerial reconnaissance, aerial photo interpretation and information provided by landowners, tenants, agencies and members of the general public through direct contact with Stantec or at the Public Open House. After further consideration of these factors, and negotiations with landowners, the Final Route was selected.

Physical, natural, and socio-economic features were identified along the Final Route. A detailed review of the potential effects of the Project on these features is provided in the ER. One of the main changes to the fifth edition of the *OEB Guidelines, (2003)* is a more in-depth analysis of Cumulative Effects (CE). It focuses on four distinctive effects pathways when analyzing and assessing CE. Stantec undertook a review of the Cumulative Effects Assessment (CEA) completed as part of the 2007 EA Update to ensure that each pathway was identified. Through the implementation of financial compensation, environmental rehabilitation, and follow-up monitoring programs, the CEs associated with the proposed pipeline are not predicted to be significant.

In the opinion of Stantec, the recommended program of mitigation, monitoring, and contingency measures addresses the concerns raised to date during the public consultation program. It also addresses any effects, including potential CEs, identified during the detailed technical review of the Final Route. With the implementation of all of the above-noted measures during the construction and operation phases of the Project, Stantec is of the opinion that no significant adverse environmental or socio-economic effects will occur.

TECUMSEH COMPRESSOR STATION TO LADYSMITH NATURAL GAS STORAGE POOL ENVIRONMENTAL ASSESSMENT UPDATE

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1.0 Introduction

1.1 DESCRIPTION AND PURPOSE OF THE PROPOSED PIPELINE

Enbridge Gas Storage Operations (“Enbridge”) is proposing to install a 20-inch (508 mm) diameter steel pipeline to facilitate easier access to the Ladysmith Natural Gas Storage Pool. The proposed pipeline begins at Enbridge’s Tecumseh Compressor Station and ends at the Ladysmith Natural Gas Storage Pool. The Tecumseh Compressor Station is located in the north part of Lot 19, Concession 7, Township of St. Clair (formerly Moore Township). The Ladysmith Natural Gas Storage Pool underlies Lots 19 through 21 on Concessions 4 and 5, Township of St. Clair, County of Lambton. The approximate length of the proposed pipeline is 4.5 km (**Figure A1-4, Appendix A**). This Environmental Assessment (EA) has been prepared to accompany Enbridge’s application to the Ontario Energy Board (OEB) for Leave to Construct the proposed pipeline.

In 1993 ESG International Inc. (now Stantec Consulting Ltd. (“Stantec”)) prepared an EA for a similar pipeline for Tecumseh Gas Storage (now Enbridge) (**Appendix F**). It should be noted that the information presented in the 1993 EA, including all appendices, does not necessarily reflect Enbridge’s current practices. Due to changing demands for natural gas supply the pipeline project proposed in 1993 was never constructed. In 2006, Enbridge reactivated the Tecumseh Compressor Station to the Ladysmith Natural Gas Storage Pool Project (“the Project”) and retained Stantec to re-evaluate and update the 1993 EA.

1.2 PURPOSE AND ORGANIZATION OF THE REPORT

In May 2003 the OEB released a revised edition of their *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines (2003)* (“OEB Guidelines (2003)”). This Update Report is an addendum to the original EA (1993) that was completed under the OEB’s *Environmental Guidelines for Locating, Constructing and Operating Hydrocarbon Pipelines in Ontario, Third Edition (1989)*, and incorporates the requirements of the *OEB Guidelines (2003)*.

When seeking Leave to Construct approval, pipeline companies may apply to the OEB under appropriate sections of the *Ontario Energy Board Act, 1998*. Applications to the OEB must include information that allows the OEB to make an informed decision, including:

- Engineering design and construction plans for the proposed pipeline;
- An EA including a route evaluation study and mitigation plans in support of the Application; and,
- Easement acquisition, and landowner and tenant relations considerations.

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In order to fulfill these criteria, the information presented in this EA has relied on technically sound and consistently applied procedures that are replicable and transparent. This report provides documentation of the EA activities undertaken for development of the proposed pipeline; it is organized into eleven sections:

- Section 1 provides a description of the proposed facilities, the approval process, and the role of the EA study;
- Section 2 details the study process for the EA;
- Section 3 provides a summary of the inventory of existing environmental conditions (physical, natural, agricultural, and socio-economic) within the Study Area. Detailed background information pertaining to the Study Area is provided in **Appendix C**;
- Section 4 describes the public consultation program for the EA;
- Section 5 describes the route evaluation methodology;
- Section 6 describes existing environmental conditions (physical, natural, and socio-economic) along the Final Route; identifies potential impacts of construction and operation of the proposed pipeline; and recommends mitigation measures;
- Section 7 describes the potential impacts associated with hydrostatic testing, and mitigation measures;
- Section 8 provides an analysis of potential cumulative effects associated with the proposed project;
- Section 9 describes monitoring and contingency plans to address potential impacts of the proposed pipeline; and,
- Section 10 provides a summary and conclusions.

The EA also includes a list of references (**Section 11**) and appendices for supporting documentation. Environmental features maps and environmental alignment sheets are also compiled in the appendices.

1.3 OBJECTIVES OF THE EA

The primary objective of this EA is to ensure environmental protection during construction and operation of the proposed pipeline, and at the same time meet the intent of the *OEB Guidelines* (2003). To meet these objectives, the EA study:

- Identifies existing environmental and socio-economic features that could be affected by the Project;

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- Identifies an environmentally acceptable route for the proposed pipeline;
- Identifies stakeholder interests (including regulatory and landowner issues) and appropriate mitigation measures to ensure concerns raised by interested parties are addressed; and,
- Establishes the mitigation and protective measures required to avoid or minimize any potential environmental effects associated with construction and operation of the proposed pipeline.

In addition, this EA study considered relevant provincial and federal guidelines and regulations. The documents reviewed included:

- The Technical Standards and Safety Authority (TSSA) mandate derived from the Technical Standards and Safety Act (2000), specifically *Oil and Gas Pipeline Systems* Ontario Regulation 210/01 and the TSSA *Guidelines for Development in the Vicinity of Oil and Gas Pipeline Facilities* (1998a) and *Guidelines for Locating New Oil and Gas Pipeline Facilities* (1998b);
- The Department of Fisheries and Oceans (DFO) interests in fisheries (*i.e.*, no net loss policy, potential for Harmful Alteration, Disruption or Destruction of aquatic habitat; Government of Canada, 1995);
- The Ministry of the Environment's technical mandate derived from the Environmental Protection Act (1990b), and the Ontario Water Resources Act (1990c); and,

The *OEB Guidelines (2003)* define the major steps in selecting a route for a proposed pipeline. Based on these requirements, this report has been prepared to:

- Define a Study Area and compile an inventory of physical, natural, and socio-economic features and conditions within this area;
- Identify and evaluate potential pipeline route alternatives in light of their individual and comparative environmental impacts;
- Identify an environmentally acceptable route that minimizes environmental impacts and meets Enbridge's operating system requirements;
- Complete a detailed review of environmental features along the proposed route and assess the potential effects of the pipeline on these features;
- Define mitigation measures that may be utilized to minimize any potential environmental impacts of pipeline construction;
- Develop a consultation program to contact, record and reflect the concerns and comments of area residents, landowners, federal and provincial ministries and agencies,

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municipalities and conservation authorities having jurisdiction within the Study Area and along the proposed routes; and,

- Identify an environmental protection plan that includes monitoring, contingency plans, an inspection program, and commitments to additional work.

Key features of this study have been early and frequent contact with the public and regulatory agencies, and their continued involvement through all stages of the process, including:

- Notice of study commencement and Study Area definition;
- Invitation to attend a Public Open House to discuss the accuracy of environmental mapping, the EA study process, and potential mitigation and protection measures and to present the Preliminary Preferred Route;
- Specific input through discussions and meetings with affected residents and landowners concerning the selection of the Final Route and protection and mitigation needs along the Final Route; and,
- Telephone discussions and meetings with representatives from various environmental regulatory agencies.

Throughout the Project, contacts were made via letters, email and phone calls. A history of contacts with agencies, stakeholders and the public is assembled in **Appendix B**.

1.4 APPROVAL PROCESS AND REGULATORY REQUIREMENTS

In order to obtain approval to construct a pipeline, proponents must submit an application to the OEB that establishes that the Project is in the public interest. As a regulatory body, the OEB must be assured that project sponsors meet all standards and regulations relating to both the protection of the environment and public health and safety.

This EA is consistent with the *OEB Guidelines (2003)*, which must be considered when applicants, such as Enbridge, seek approval from the OEB. The *OEB Guidelines (2003)* provide direction as to the content of the EA with respect to project description, route selection process, environmental and socio-economic descriptions, environmental impact assessment, and mitigation. Other requirements of the *OEB Guidelines (2003)* include compliance and effects monitoring programs, specific mitigation and contingency plans for implementation during construction, and public participation throughout the planning process.

Once completed, the EA is circulated or made available to the Ontario Pipeline Coordinating Committee (OPCC), other federal and municipal government agencies, interest groups, landowners, and other interested parties for their review and comment prior to a hearing before the OEB.

2.0 EA Study Process

This EA study update was initiated and prepared in 2006 and 2007 by a multidisciplinary team of environmental scientists and planners. Enbridge provided additional environmental support and engineering expertise throughout the study, as required.

As described, the study has been completed with consideration to the requirements of the *OEB Guidelines (2003)*. The various steps outlined in the process have been divided into three phases, as presented in **Figure 2-1**.

2.1 PHASE I – INVENTORY AND MAPPING OF ENVIRONMENTAL FEATURES

The study update commenced with notification to relevant federal, provincial, and municipal agencies, as well as public interest groups. Updated environmental features and conditions in the Study Area were mapped and characterized based on published and unpublished literature, and maps. All geographically based environmental features and conditions were incorporated onto a series of digital base maps. Discussions with the St. Clair Region Conservation Authority (SCRCA), and the County of Lambton, as well as information collected from relevant sources, provided information essential to compilation of the environmental inventory.

2.2 PHASE II – PIPELINE ROUTE SELECTION PROCESS

Phase II involved a review of the feasibility of the 1993 Preferred Route as well as the identification of the 2007 Preferred Route, and public consultation regarding the 2007 Preferred Route. The alignment of the 1993 Preferred Route and 2007 Preferred Route are illustrated in **Figure A1-2, Appendix A**. The alignment of the 2007 Preferred Route was identified following discussions with Enbridge, a review of the data collected in Phase I, field surveys of the Study Area, and consideration of significant environmental features identified in the Study Area. To evaluate the 1993 and 2007 Preferred Routes, environmental constraints and opportunities were identified and used in conjunction with environmental features mapping, as well as Enbridge's criteria such as engineering, operations and cost.

A Public Open House was held at the beginning of Phase II, on March 21, 2007. The general public and interested parties were invited to attend the Public Open House through newspaper notices. Government agency representatives and all residents along the 1993 and 2007 Preferred Routes were invited to attend the Public Open House through an invitation sent via addressed mail. The Public Open House provided attendees an opportunity to review and comment on the study process, environmental features mapping, the 2007 Preferred Route and the proposed evaluation measures. **Appendix B4** includes copies of all correspondence relating to the Public Open House.

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There were seven attendees to the Public Open House residing directly adjacent to either the 1993 or 2007 Preferred Routes. Public Open House attendees voiced concerns regarding effects on tile drainage, land restoration and utilization, woodlot damage, and why the 1993 Preferred Route is not preferred in 2007.

Following the Public Open House, Enbridge met with several landowners in groups and individually to discuss the 2007 Preferred Route. After negotiations with landowners, Enbridge determined that an alignment parallel to the 1993 Preferred Route would be the Final Route. Detailed information pertaining to the route selection process can be found in **Section 5**.

The alignment of the Final Route is illustrated in **Figure A1-4, Appendix A**.

2.3 PHASE III – FINAL ROUTE ALIGNMENT AND RECOMMENDED MITIGATION MEASURES

Phase III included a survey along the Final Route, refining the Final Route alignment, identification of mitigative and protective measures, and a description of the net environmental effects along the Final Route. Net environmental effects are considered to be the state of environmental features following installation of the pipeline and implementation of the recommended mitigation measures.

Refining the Final Route involved a detailed review of the alignment of the pipeline along the Final Route corridor in order to avoid and/or minimize potential effects through minor route deviations. The proposed mitigation measures are based on Stantec's previous experience in reviewing pipeline construction practices and Enbridge's Construction Specifications. Additional mitigation measures, such as watercourse crossing techniques, were identified to address specific concerns along the Final Route. Photomosaics were prepared showing the alignment of the Final Route, the environmental features along the route, locations where relevant construction specifications apply, and locations where additional site specific mitigation is required.

Further analysis and refinement of the Final Route was conducted, based on public input and agency comments. The Final Route is illustrated in **Figure A1-4, Appendix A**.

An important principle of planning is public participation. This study invited the participation of government agencies, community interest groups, the public, and potentially affected landowners through letters and a notice in local newspapers. A Public Open House was held on March 21, 2007. Representatives from Stantec and Enbridge were available to answer questions. Additional communications about the Project were conveyed through direct agency contacts as well as telephone, facsimile, and written correspondence. A summary of the correspondence is provided in **Appendix B1**.

A CEA was carried out for the Final Route. The EA will be distributed to relevant agencies, directly affected landowners and to all others who request a copy.

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Figure 2.1 ER Study Process for the Proposed Pipeline

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Back of Figure 2-1

3.0 Environmental Features in the Study Area

3.1 DATA SOURCES AND MAPPING

Information provided by various agencies, residents and other stakeholders within the County of Lambton was used to identify environmental and socio-economic features within the Study Area.

By necessity, the analysis, integration, and synthesis of data are iterative processes, as information becomes available at various stages of the study and at different mapping scales. The level of detail of data and mapping increases as the study progresses from analysis of the Study Area, to analysis of route alternatives, and finally, to a site-specific survey of features along the Final Route.

The base for features mapping (**Figures C1-1 through C1-4, Appendix C1**), has been generated from air photos provided by Monteith and Sutherland (2002). Scales have been adjusted from the original to better represent the features mapped. Further mapping sources are identified in the Bibliography (**Section 11**). Stantec has digitally reproduced features added to the base map.

The environmental and socio-economic information presented in this EA is based on data provided by individuals and agencies during the Public Consultation Program, documented in published reports cited throughout the EA, and collected through ground surveys conducted by Stantec and Enbridge. Where agencies requested that information be kept confidential, such as the precise location of rare, threatened, vulnerable or endangered species and archaeological sites, such information has been withheld from the report or mapped in such a way that specific site locations are not identified.

A field survey of specific locations within the Study Area was completed prior to preparation of the EA. This information was used to confirm that the background information was sufficient to select a Final Route and develop the mitigation measures presented in the report.

3.2 STUDY AREA

The Study Area for the Project is shown in **Figure A1-1, Appendix A**. The Study Area was delineated in 1993 and was reassessed for this report based on several criteria including:

- The terminal points, as specified by Enbridge, including Tecumseh Compressor Station and Ladysmith Natural Gas Storage Pool;
- An area of sufficient size such that a range of alternate routes linking the end points could be considered without unduly lengthening routes (aside from construction costs,

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longer routes tend to encounter, and therefore affect, more environmental features in general);

- Incorporation of existing disturbed corridors or road rights-of-way where feasible and appropriate; and,
- Paralleling roads, lot lines, concession lines or Township boundaries to facilitate delineation of the Study Area where appropriate.

The Study Area boundary is just north of the division between Concessions VII and VIII, just east of the division between Lots 17 and 18, just south of County Road 80, and just west of Ladysmith Road in Township of St. Clair, County of Lambton.

The Study Area is in a predominantly rural area and agriculture is the dominant land use.

3.3 SUMMARY OF SIGNIFICANT ENVIRONMENTAL FEATURES IN STUDY AREA

The update of the environmental and socio-economic inventory of the Study Area is described in detail in **Appendix C2**. A summary of the most significant physical, biophysical, and socio-economic features in the Study Area is presented below.

3.3.1 Physical Features

The Study Area is an area of little relief with only tributary stream channels breaking the generally flat topography. Elevations range from approximately 193 m to 205 m above sea level (asl). Overall relief slopes downward towards the southwest.

Depth to bedrock is approximately 16 m to 27 m. Many of the borehole records also reveal the presence of a thin layer of sand or gravel overlying the bedrock. The gravel layer seldom exceeds 1 m in thickness.

The Study Area is located within the Lake Erie Counties Climate Region. This region is moderated by the presence of Lake Huron to the north, Lake Erie to the south, and Lake St. Clair to the west. Annually, the mean precipitation is 85 cm. On average there are 150 frost-free days in a year.

3.3.2 Agricultural Features

The majority of the Study Area is classified as agriculture in the Township of St. Clair Official Plan (County of Lambton, 2001). Most of the agricultural land within the Study Area is classified by the Canada Land Inventory as Class 3 land, and has been improved by artificial drainage systems (see **Figure C1-2 and C1-3, Appendix C1**).

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3.3.3 Biophysical Features

The Study Area is located within the Eastern Deciduous Forest Region of Canada, which includes the Carolinian Zone of Canada (Hosie, 1975). Ontario's Eastern Deciduous Forest lies along the northern shores of lakes Erie and Ontario and the southeastern shore of Lake Huron. It is the northern extension of the large deciduous forest of the northeastern United States. Many of the trees found in the Study Area are at the northern limit of their range.

The deciduous forest region contains one percent of Ontario's forests. In this region, the forest life is the most diverse in Ontario providing habitat for a number of nationally rare species of mammals, birds, plants and insects. Some examples are the sassafras and tulip tree and the southern flying squirrel (MNR, 2002).

There are no provincially significant wetlands in the Study Area. Seventeen plant and animal species of national concern, as listed under the Species at Risk Act (SARA), have habitats that overlap with the Study Area (Environment Canada, 2006). There are no plant or animal species within the Study Area that have been identified by the MNR as species exhibiting some level of concern (NHIC, 2005).

There are no natural watercourses located in the Study Area however, there are several municipal drains, regulated by the SCRCA, which flow through the Study Area.

3.3.4 Socio-Economic Features

The Study Area is located in the Township of St. Clair, which is within the County of Lambton. The population of the Township of St. Clair in 2006 was 14,649, a 0.1% decrease from 2001 (Statistics Canada, 2006). The Township of St. Clair represents approximately 11% of the population of the County of Lambton.

There is one church in the Study Area located at the corner of Moore Road 6 and Tecumseh Road.

According to the Township of St. Clair Official Plan (County of Lambton, 2001), land uses in the Study Area include Agriculture, Hazard and Environmental Protection, and Industrial Type 3. The majority of the Study Area is designated as Agriculture.

Agriculture is the dominant business activity in the area. The majority of land in the County of Lambton is used for agriculture, which is predominantly crop cultivation. In terms of employment, the County of Lambton as a whole has an estimated population of 128,204 people with an unemployment rate of approximately 6.6 % (Statistics Canada, 2006).

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4.0 Public Consultation Program

Public consultation is a critically important component of environmental assessment, and an essential requirement of the *OEB Guidelines (2003)*. Public consultation is the process of identifying and informing the public about the Project, soliciting information about their values and the local environmental and socio-economic circumstances, and receiving advice about key project decisions before those decisions are finalized. This study update included the meaningful participation of government agencies, interest groups, the general public, and potentially affected landowners through various communication channels including a Public Open House. Additional communication about the Project was undertaken through direct agency and landowner meetings, as well as telephone, email, facsimile and written correspondence.

The public consultation program included the following objectives:

- Identify interested and potentially affected parties;
- Inform and educate the public about the nature of the Project, potential impacts and how to participate in the public consultation process;
- Provide a forum for the identification of issues;
- Identify how public input will be used in the planning stages of the Project; and,
- Summarize issues for resolution, and resolve as many issues as possible.

The public consultation process for the Project was divided into three phases. The main goal of the first phase was to identify and notify the relevant public about the Project and to get their input early in the process. The focus of the second phase was to present the 2007 Preferred Route to the public and to solicit their input. The third phase involved the compilation and incorporation of all of the information received in the first two phases into the EA, and the selection of the Final Route and determination of specific mitigation measures while considering this information.

The main goal subsequent to the selection of the Final Route focuses on the review of the EA and ongoing availability of the study team for questions and concerns from agencies and landowners.

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4.1 IDENTIFYING, NOTIFYING, AND UPDATING THE PUBLIC

Newspaper ads and mailings were used to notify residents within the vicinity of the Study Area about the Project, and to invite them to become involved in the EA Update through the Public Open House held on March 21, 2007. Newspaper ads also helped identify other groups, persons, associations, or government agencies that could be affected, either directly or indirectly, in a positive or negative manner, during the planning, construction, or operation stages of the Project.

Agency contact letters, and project newsletters were developed to notify and introduce the public and agencies to the Project and to identify how they could be included in the decision-making process.

The Study Area is located in the Township of St. Clair, County of Lambton. The parties listed below were considered when identifying the initial relevant public:

- All residents along the 1993 Preferred Route and 2007 Preferred Route (through newspaper advertisements, direct mail and the Public Open House);
- The general public, and businesses in and around the Study Area (through newspaper advertisements and the Public Open House);
- Agencies, stakeholders and institutions e.g. SCRCA, and Ontario Ministry of Natural Resources (MNR) (through direct mailing, and newspaper advertisements);
- Interest groups in the Study Area (through direct mailings, newspaper advertisements, and the Public Open House); and,
- Members of Municipal, Provincial, and Federal government (through direct mailings).

4.1.1 Project Newsletter

A newsletter was developed for distribution at the Public Open House to inform the public of the study process. The newsletter identified key issues on which public and agency advice was being sought; the schedule of the Project, and important contact information for members of the Project team.

The newsletter was provided to Public Open House attendees on March 21, 2007. The newsletter introduced the Project, outlined a tentative project schedule, described the purpose of the Public Open House, and presented the 2007 Preferred Route. Through the newsletter, Stantec asked for input into selection of the Final Route and the study process. Issues discussed in the newsletter included how to get involved, route selection, and evaluation measures for the 2007 Preferred Route. A copy of the Project newsletter can be found in **Appendix B4**.

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4.1.2 Mailouts

Addressed letters were mailed to agencies on June 21, 2006, to inform them of the commencement of the Project. A copy of this agency correspondence can be found in **Appendix B2**. Letters were also sent out on March 5, 2007 to invite potentially affected landowners and agencies, to attend the Public Open House. A copy of this landowner and agency correspondence can be found in **Appendix B4**.

4.1.3 Newspaper Ads

Notice of project commencement and the Public Open House for the Project was published in four local newspapers (The Dresden Leader, The Wallaceburg News, The Lambton County Smart Shopper and The Sarnia Observer). The Public Open House was advertised on March 7, and March 14, 2007 (The Dresden Leader, The Sarnia Observer), and March 9 and March 16, 2007 (The Wallaceburg News and The Lambton County Smart Shopper). The advertisements identified the Project and the area being studied and were intended to generate public interest in the proposed project and the Public Open House. The advertisement also indicated the alignment of the 2007 Preferred Route. Interested parties were invited to comment on the 2007 Preferred Route, and construction procedures, and to suggest any areas where specific mitigation measures might be necessary. A copy of the newspaper notice is included in **Appendix B4**.

Once Enbridge has applied to the OEB, for Leave to Construct the proposed pipeline, they will be directed by the OEB to publish a Notice of Application in local newspapers.

4.2 RECEIVING INPUT FROM THE PUBLIC

The public provided invaluable input through two key mechanisms: the Public Open House, and exit questionnaires. The public provided input regarding important features within the Study Area and which routing factors were most important in the route selection process. All comments and input were considered in the route selection and EA process.

4.2.1 Agency Contacts

An agency contact letter requested all interested agencies, including local municipal and business leaders, MPs, MPPs, councillors, and adjoining municipalities, to provide Stantec with pertinent information that may affect the routing, construction, or operation of the proposed natural gas pipeline. This letter was circulated to agencies on June 21, 2006. Specific information was sought regarding policies, guidelines, and legislation that may affect the outcome of the EA. A copy of this letter and the contact list that was used is provided in **Appendix B2**.

A copy of all correspondence between Stantec and agencies is attached in **Appendix B3**. Recommendations and findings from corresponding agencies have been incorporated into the EA as required.

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4.2.2 Public Open House

The Public Open House was held within the Study Area, at the Sixth Line United Church on March 21, 2007, from 6:00 to 9:00 p.m. The purpose of the Public Open House was to provide landowners, agencies and other stakeholders an opportunity to:

- View the environmental features mapping and background data collected to date;
- Ask questions and comment on the planning process followed; and,
- Comment on the study methodology and the 2007 Preferred Route.

Stantec and Enbridge representatives were present at the Public Open House to provide information, answer questions, and receive comments. The sign-in book for the open house contained 14 signatures. Each attendee was offered a newsletter and an exit questionnaire. The questionnaire was to be completed and returned to Stantec either that evening or through the mail, using a postage paid envelope that was available at the Public Open House.

Analysis of the open house registration book and cross referencing with the landowners in the contact list indicates that seven attendees were landowners residing along either the 1993 or 2007 Preferred Routes. Questions and comments discussed with members of the public regarding the pipeline were mainly related to routing, and disturbances to the environment. Several attendees inquired as to why the route selected in 1993 was no longer preferred by Enbridge.

Exit questionnaires were developed to solicit input from attendees at the Public Open House. The exit questionnaire requested input regarding the route selection process, site-specific features, and any other comments or feedback. The exit questionnaires were distributed at the Public Open House (with self-addressed stamped envelopes for return to Stantec). A total of ten exit questionnaires were returned either during the Public Open House or by mail.

Exit questionnaires received from the Public Open House indicated that members of the public were primarily concerned with disturbance to artificial drainage systems, agricultural capability, and pipeline abandonment issues. Two responses indicated that the artificial drainage mapping was incorrect. One landowner notified Stantec that their property was systematically drained, and this information was used to update **Figure C1-3, Appendix C1**. One landowner notified Stantec that they had removed a woodlot, however, this woodlot will not be affected by either of the alternate routes, and therefore has not been removed from the figures. Seven of the responses received from the exit questionnaires were from landowners along the 1993 Preferred Route, or the 2007 Preferred Route

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No respondents indicated that the 2007 Preferred Route was the optimal route, and one respondent indicated that the 1993 Preferred Route was the optimal route.

A summary of the returned questionnaires from the Public Open House is included in **Appendix B5**.

4.2.3 Stakeholder Consultation

Following distribution of the agency and landowner contact letters, Stantec made and received various phone calls to interested parties including representatives of the SCRCA, County of Lambton, and the MNR to gather background information for the Project.

Enbridge held several meetings with individual landowners to discuss issues and concerns regarding the Project.

The landowners in Lot 19, Concession V, whose properties would be affected by the 2007 Preferred Route as well as the stakeholder that leases and farms these lands expressed concerns with the potential impact of the pipeline on their lands. Subsequent to the Public Open House, Enbridge has met with the landowners and tenant to suggest alternatives that would potentially reduce the amount of land affected by the construction and operation of the pipeline. These suggestions included a diagonal alignment as well as an alignment that would follow the border of the woodlot at the west edge of these properties. It was determined that neither of these options was more favourable than the alignment of the 2007 Preferred Route. After further discussions with the landowners and tenant, it was determined that the 2007 Preferred Route was not acceptable. Subsequently, Enbridge elected to pursue an alignment almost immediately adjacent to the 1993 Preferred Route.

Enbridge has met with several landowners in the Study Area, however, their main concerns were generally related to compensation, which is outside the scope of this report.

Stantec received written correspondence voicing issues or concerns with this project from the TSSA, and the MNR.

The TSSA informed Stantec that the Ontario Regulation on Oil and Gas Pipeline Systems has been updated and requirements are found in O. Reg. 210/01, entitled *Director's Order of Amendment to the Oil and Gas Pipeline System Code Adoption Document*. Consideration was given to this regulation while preparing this EA Update.

The MNR informed Stantec of the presence of several natural gas wells that will need to be considered during construction of the Project. They also informed Stantec that there are several woodlots in the Study Area and suggested contacting the municipality to determine their significance.

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The County of Lambton was contacted to determine the significance of the woodlots that could be affected by the Project. The County of Lambton referred Stantec to the Township of St. Clair Official Plan and the County of Lambton Official Plan which states that woodlots should be avoided if at all possible. Should tree clearing be necessary, for every tree removed two must be planted, ideally within the same general area removed.

A summary table displaying information, questions, and concerns received from stakeholders, as well as responses, is located in **Appendix B1**. Copies of correspondence with agencies are located in **Appendix B3**.

4.2.4 First Nations Consultation

Stantec contacted Indian and Northern Affairs Canada (INAC) on June 21, 2006 to seek information regarding the status of lands within the Study Area. A letter notifying them of the March 21, 2007 Public Open House was sent on March 5, 2007.

INAC replied to Stantec's information request on June 29, 2006. The letter notified Stantec that no specific claims have been submitted in the Study Area. However, they can only speak directly to claims filed under the Specific Claims Policy for the Province of Ontario. They suggested that the Comprehensive Claims Branch or the Litigation Management and Resolution Branch be contacted to receive information in regards to claims under Canada's Comprehensive Claims Policy or legal action by First Nations against the Crown.

INAC's Comprehensive Claims Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. Stantec was notified that there are no claims within the area southeast of Sarnia, and therefore the Study Area.

INAC's Litigation Management and Resolution Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. A map showing the Study Area was emailed to aid in the information request. A response was received on April 30, 2007 stating that there were active litigation cases in the vicinity of the Study Area. INAC stated that they could not comment with respect to the possible effect of these claims as the cases have not yet been adjudicated. INAC recommended consultation with legal counsel to determine the potential effects of these actions on the lands within the Study Area.

A summary of the agency consultation is included in Appendix B1 and copies of correspondence with INAC are located in **Appendix B3**.

4.3 COMPILATION AND INCORPORATION OF INPUT

At each stage of the public consultation process, input received from the public and agencies was compiled, reviewed, and incorporated into project mapping and EA decision-making. Responses were provided to relevant agency comments and all questions and concerns received from the public, either by letter, email, or telephone. Information and input provided by the public and agencies were considered throughout the process in identifying and describing

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environmental features within the Study Area, evaluating the 1993 and 2007 Preferred Routes, selecting and refining the Final Route, and developing appropriate mitigation measures.

4.3.1 Follow-up

The public consultation program has attempted to resolve all issues identified through clarification by project team members, or through selection of a Final Route that minimized potential impacts upon environmental or socio-economic features. Ongoing meetings with directly affected landowners are expected to resolve any outstanding issues.

Following completion, the EA Update will be circulated to relevant agencies, directly affected landowners, and members of the public who have requested a copy for review. Enbridge will continue to work to resolve issues of interest and concern to landowners and other stakeholders, through a combination of individual meetings with landowners and interested parties, and through other project initiatives. Communication channels will remain open throughout the regulatory, construction, and operational phases of the Project.

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5.0 Route Evaluation Methodology

In 1993 the Preferred Route for the proposed pipeline was selected through a process that involved several landowner interviews, as well as a quantitative prediction of the environmental impacts of pipeline construction on four alternate routes. The process confirmed many findings and assumptions made by the study team through the implementation of a public consultation program in 1993.

5.1 ROUTING OBJECTIVES AND ENVIRONMENTAL CONSTRAINTS

5.1.1 Routing Objectives

In 1993 the process of developing alternate routes commenced with the identification of routing objectives. Routing objectives are the general principles used to create reasonable and/or feasible alternate routes. The following objectives were considered to generate alternate routes within the Study Area:

1. Routes should follow a reasonably direct path between end-points, minimizing length as well as potential for environmental and socio-economic impacts;
2. Routes should avoid sensitive environmental features to the extent possible, where they cannot be avoided, routes should be located to minimize impacts;
3. Existing linear features should be utilized or paralleled to the greatest extent possible in order to minimize impacts to previously undisturbed land; and,
4. Where new easements are required, existing lot/property lines should be followed to avoid diagonal crossings of properties.

Consideration was also given to provincial planning policies, guidelines, and regulations that were in effect in 1993.

5.1.2 Environmental Constraints and Opportunities

Environmental constraints are features that would be adversely affected by pipeline construction or operation, or features that possess unique attributes. Opportunities are existing features, such as a linear corridor or physical boundary, which provides a suitable location for the alignment of a pipeline. The environmental inventory, undertaken in 1993, identified many of the features considered either as pipeline routing constraints or opportunities.

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The identification of sensitive environmental features (*i.e.* constraints) was based on the following criteria:

- Site-specific mitigation measures would be required to minimize potential impacts;
- The feature has been selected or designated for protection; or,
- The feature has been recognized through local, regional, provincial, or federal policy, plan, or statute, or is otherwise valued as a social or economic resource.

Considering the criteria listed above, examples of significant environmental and socio-economic features in the Study Area that were identified in 1993 include:

- Uniformity of poorly drained soils;
- Importance of the extensive system of private and public artificial drainage;
- Moore Township (now the Township of St. Clair) emphasis on routing parallel to existing man-made features;
- Limited vegetation (% cover);
- Absence of high fisheries potential;
- Importance of petroleum resources to local economy; and,
- Extensive network of hydro transmission lines and oil, gas, and water pipelines.

Sensitive environmental and socio-economic features were avoided wherever possible during the development of the alternate routes. The relatively small size of the Study Area resulted in the identification of very few sensitive features and very few routing opportunities. The location of some of these features precluded them from being avoided entirely in the generation of the alternate routes. The location and extent of all environmental and socio-economic features are illustrated in **Figure C1-4, Appendix C1**.

Within the Study Area existing opportunities that were considered in the generation of alternate routes include pipeline rights-of-way, lot and property lines, hydro easements, and road allowances.

5.2 GENERATE ALTERNATE ROUTES

Generation of the alternate routes was based on the routing objectives and environmental constraints and opportunities. Paralleling existing linear features presents opportunities to reduce the area of land potentially impacted by construction and operation of the proposed pipeline. In 1993, this opportunity allowed the study team to generate four alternate routes that could be considered for the alignment of the proposed pipeline. Each of these alternate routes

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and allowed a reasonably direct connection of the end points. In addition, each of these alternate routes was considered environmentally acceptable, provided that Enbridge's standard protection and mitigation measures were employed.

Alternate Route A

Alternate Route A starts at the point where a north-south oriented 115 kV steel tower transmission line crosses County Road 80. Route A runs west along the south side of County Road 80 to Ladysmith Road. At this point Route A turns north and parallels Ladysmith Road to the north limit of Concession VII before turning east. The route then parallels Cameron and Laur Drains east to the Tecumseh Compressor Station. Route A is 6.7 km in length.

Alternate Route B

Alternate Route B starts at the same point on County Road 80 as Route A, parallels an existing Ontario Hydro easement and an existing Union Gas easement northwards to the north limit of Concession VII. It then turns east parallel to the south side of the north limit of Concession VII to the Tecumseh Compressor Station. The total length of Route B is 4.5 km.

Alternate Route C

Alternate Route C starts at the same point on County Road 80 as Route A and parallels County Road 80 along the south side in an easterly direction to Tecumseh Road. It then turns north and parallels the east side of Tecumseh Road to the Tecumseh Compressor Station. Route C is 4.5 km long.

Alternate Route D

Alternate Route D starts at the same point on County Road 80 as Route A and heads due east along County Road 80 to the Wilkesport pipeline easement. It then parallels the easement on the west side to a point on Lot 18, Concession VII and then turns west to the Tecumseh Compressor Station. The total length of Route D is 5.4 km.

These alternate routes were presented to the public during landowner surveys, conducted by TGS's (now Enbridge) land agent in October 1992. Landowners commented on the environmental features mapping and alternate route preference.

5.3 1993 PREFERRED ROUTE

The comments made by the landowners and the expert opinion of ESG (now Stantec) led the study team to identify Alternate Route B as the Preferred Route ("1993 Preferred Route"). This route paralleled an existing Ontario Hydro easement and an existing Union Gas pipeline easement northwards to the north limit of Concession VII. The 1993 Preferred Route then turned east parallel to the south side of the north limit of Concession VII to the Tecumseh Compressor Station.

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5.4 2007 REVIEW OF THE 1993 PREFERRED ROUTE

Shortly after commencing the EA Update, Enbridge advised Stantec that they had become aware of substantial operation and construction concerns associated with the alignment of the 1993 Preferred Route. Specifically, Enbridge determined that pipelines in the vicinity of high voltage hydro corridors require special design, construction, and maintenance requirements to mitigate the potential impacts of electrostatic interference, electromagnetic interference, and resistive interference. These potential impacts are most effectively mitigated by increasing the separation distance between the pipeline and the transmission line.

Subsequent to the initiation of the EA Update and prior to the 2007 Public Open House, Enbridge solicited Stantec's opinion on the environmental acceptability of a revision to the 1993 Preferred Route that would shift the north/south section of the 1993 alignment approximately 300 m east. This alteration to the route was suggested in order to decrease the distance that the pipeline would be aligned parallel to the Ontario Hydro electrical transmission line. CSA clause 4.9 requires that pipelines in proximity to electrical transmission lines shall comply with CAN/CSA-C22.3 No. 6 *Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines*. This standard applies where the pipeline and hydro transmission line right-of-way boundaries are at, or within 100 m of each other and the transmission line voltage (to ground) exceeds 35 kV. It is recommended in the CSA standard that pipeline systems should avoid or minimize the length of pipeline running within 100 m of electrical transmission corridors in order to reduce the risk of voltage to be induced in the pipeline. As such, Enbridge prefers a route which provides at least 100 m of separation. Stantec reviewed the 2007 Preferred Route, developed by Enbridge, and found it to be environmentally acceptable provided that standard protection and mitigation measures were employed. The location of the alignment proposed in 2007 appears as a yellow-dashed line on **Figure A1-3, Appendix A**. The 2007 Preferred Route was identified to agencies and the public through written correspondence and public consultation.

No agencies expressed opposition or concern regarding the location of the 2007 Preferred Route. None of the attendees to the March 21, 2007 Public Open House indicated that the 2007 Preferred Route was the most ideal route. Most attendees inquired as to why the alignment of the route proposed in 1993 was no longer acceptable to Enbridge.

One attendee indicated that the 1993 Preferred Route was the optimal route despite Enbridge's construction and operational concerns. The attendee expressed particular concern with the location of the 2007 Preferred Route through the center of two agricultural fields located in Lot 19, Concession V. At this location, the 2007 Preferred Route crosses through the center of two agricultural fields for a distance of approximately 700 m before rejoining an existing fenceline.

In order to investigate this particular concern Enbridge and Stantec undertook detailed route investigations to identify modified alignments that would reduce the potential impacts upon agricultural operations in Lot 19, Concession V. Two modified alignments were identified, investigated, and discussed with the affected landowner and tenant farmer.

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The first modification follows the property line between Lots 19 and 20 of Concession V, following a small portion of the 1993 Preferred Route. This alignment impacts a woodlot designated as significant by the County of Lambton. In addition, Enbridge completed a field survey of this modified alignment which revealed that this area was very wet, likely requiring dewatering during construction. This modified alignment is also situated in close proximity to a high voltage electrical transmission line which is a concern to Enbridge during construction and operation of the proposed pipeline.

The second modification to the 2007 Preferred Route crosses a portion of Lot 19, Concession V diagonally; this modification reduces the area of land affected by the construction and operation of the pipeline. Neither of these modified alignments were acceptable to the landowner or the tenant farmer.

After negotiating with landowners, it was determined by Enbridge that an alignment acceptable to landowners affected by the 2007 Preferred Route could not be established. Subsequently, Enbridge decided that an alignment almost entirely adjacent to the 1993 Preferred Route would make up the alignment of the Final Route. Due to its similarity to the 1993 Preferred Route, Stantec determined that the Final Route, which would be situated approximately 15 m west of the 1993 Preferred Route, was environmentally acceptable, provided that the recommended protection and mitigation measures are employed by Enbridge.

5.5 CONFIRMATION OF FINAL ROUTE

The Final Route for the proposed pipeline was selected based on field surveys, environmental and socio-economic constraints, consultation with agencies and landowners, consideration of comments received during the Public Open House (held on March 21, 2007) as well as operational and technical considerations. The location of the Final Route is illustrated on **Figure A1-4, Appendix A**.

Comments regarding potential impacts upon environmental and socio-economic features were also used to help determine appropriate mitigation measures to further reduce potential impacts along the Final Route.

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6.0 Route Mitigation Measures

This section:

- Describes the physical, natural environment and the socio-economic features which occur along the Final Route;
- Discusses the impact of construction and operation of the Final Route; and,
- Recommends mitigation measures to reduce potential negative effects.

Specifically, this section identifies opportunities such as construction methods and timing to reduce potential negative impacts on environmental and socio-economic features along, or in close proximity to, the Final Route for the proposed pipeline. The mitigation photomosaics, included as **Appendix D**, illustrate the proposed alignment of the pipeline; as well they identify some of the mitigation measures outlined in this section.

For cross-country corridors, constructing adjacent to linear features significantly reduces the potential negative impacts that pipeline construction and operation could have. The Final Route is entirely adjacent to existing easements occupied by hydroelectric transmission corridor and/or pipelines. The Final Route parallels the east limit of Lot 20, Concessions V, VI, and VII and is adjacent to the west side of a Hydro One easement for approximately 1.3 km and a Union Gas easement for approximately 2.7 km. The Final Route then turns east paralleling the lot line between Concessions VII and VIII and is adjacent to a Niagara Gas easement for approximately 630 m. The alignment of the route reduces potential impacts to vegetation and agricultural operations. A number of mitigation measures are recommended to reduce or eliminate potential adverse effects, and are provided in the following sections.

6.1 PHYSICAL FEATURES

6.1.1 Physiography

Potential Impacts

Topography along the Final Route is virtually flat. Potential impacts to physiographic features typically occur on slopes adjacent to watercourses. Potential impacts may include surface soil erosion, trench slumping, and in extreme cases, sedimentation in watercourses. The alignment of the Final Route does not affect any areas where slope stabilization concerns exist. However, there are two municipal drains in the vicinity of the Final Route, Laur Drain, and Arnold Drain.

During construction, soils are more prone to erode due to the loss of vegetative cover, intensity and duration of rainfall events, antecedent soil moisture, surface soil cover, slope, soil texture, soil structure, and organic matter levels.

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The banks of Arnold Drain may require grading to accommodate installation of the pipeline. Grading involves the removal of topsoil from the drain banks and “cutting” into the bank to accommodate installation of the pipeline. Essentially, the slopes approaching the drain bed are temporarily removed, the pipeline is installed, and the drain banks are restored to their original pre-construction condition.

To reduce the risk of complications associated with grading the slopes of the waterways, site-specific mitigation measures are required. Preparation for grading, which includes vegetation clearing, should not be initiated until the date of the actual watercourse crossing is imminent. Retaining trees and grasses on the approach slopes of the municipal drain will minimize the risk of slope failure and siltation of the drain bed.

Clearing, topsoil stripping, and grading activities should be initiated as close as possible to the date of the drain crossing. Prior to any construction activity, silt fence, fronted with a row of straw bales, should be securely installed on both banks of the watercourse parallel to the waters edge. The silt fence should be set back from the waters edge at least 2 m, and potentially 10 m, depending if the watercourse is determined to be significant at the time of construction. This barrier will protect the flowing watercourse from the transport of sediment that may be carried into the municipal drain.

All soil removed from the slope of the watercourse, including topsoil and spoil, should be stockpiled away from the edge of the watercourse at a minimum of 5 m and as far as 10 m, depending if the watercourse is determined to be significant at the time of construction. The section of the municipal drain bank immediately adjacent to the drain bed (i.e. between the erosion control fences) should not be disturbed during grading activities.

As soon as possible following completion of the drain crossing, the slopes of the watercourse should be restored to their original grade. Topsoil should be replaced at a uniform depth, retaining the cross diversion berms across the slope. Seeding should be completed during favorable climatic conditions. Once sown, seed should be protected with a layer of erosion control matting that will assist in stabilizing the slope and propagation of the seed mixture. In the event that broadcast seeding is not feasible due to climatic season restrictions, hydroseeding should be considered. The silt fence, fronted with a row of straw bales, should remain securely installed on both banks of the watercourse throughout construction, restoration, and rehabilitation of the slopes.

If excavated, the banks of the drains or municipal drains, should be restored to the original grade, and profile and stabilized immediately following backfilling.

To protect agricultural lands, during and after storm events, Enbridge will implement a wet soil shutdown practice (WSSD). The WSSD practice involves constant assessment of the conditions during a precipitation event. If, in the opinion of Enbridge, conditions deteriorate to a situation where topsoil/subsoil separation becomes too difficult and the use of mats (plating) is not

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sufficient enough to prevent ruts under vehicles becoming deep enough to cause topsoil/subsoil mixing, or excessive compaction, then those operations would cease. Operations would continue when conditions improve and those soil qualities are protected. In addition, during and following periods of excessive rainfall, the area of land disturbed for construction should be monitored for erosion activity. Where evidence of erosion exists, corrective action should be implemented as soon as conditions permit. Recommended mitigation measures that may be considered include installation of silt fencing, straw bales, and erosion control matting.

Upon completion of construction and prior to September 30th, seeding should be done to allow for germination prior to winter. Where appropriate, seeded areas should be protected with appropriate stabilizing techniques. In the event that broadcast seeding is not feasible, hydroseeding should be considered. If installed, silt fencing should be maintained throughout construction, restoration, and rehabilitation until vegetative cover is fully established. The requirement for, and location of, silt fencing should be determined by Enbridge's Environmental Inspector.

With the effective implementation of the mitigation measures recommended above, construction activities should have no adverse environmental effects upon physiographical features traversed by the Final Route.

6.1.2 Bedrock Geology

Potential Impacts

The study area lies within the St. Clair Clay Plain physiographic region identified by Chapman and Putman (1984). The depth to bedrock is approximately 41 m. It is very unlikely that bedrock would be encountered during construction of the pipeline.

Mitigation and Protective Measures

Since bedrock is not anticipated to be encountered during construction of the pipeline, specific mitigation measures have not been developed.

6.1.3 Climate

Potential Impacts

Since the pipeline is proposed to be constructed almost entirely parallel to fencelines and property lines across agricultural land, potential impacts associated with inclement weather may occur. Working in wet soil conditions can result in impacts such as compaction and erosion. Consequently, impacts associated with wet soils must be avoided.

In dry conditions, high winds may generate airborne dust, which, if persistent, becomes a nuisance to residents adjacent to construction areas. Persistent, uncontrolled airborne dust is an irritant to residential and business properties located in close proximity to the proposed pipeline.

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A period of heavy rainfall may cause a significant increase in the surface and ground water levels. High water levels and rapid flows may result in flooding of the trench line, and flooding of adjacent lands.

Mitigation and Protective Measures

As discussed in the previous subsection, during wet soil conditions, construction activities on the cross-country section of the agricultural lands should be suspended in accordance with Enbridge's WSSD Practice. Construction should not resume until soils are deemed to be sufficiently dry by the Chief Inspector, as recommended by the Agricultural/Soil Inspector. Construction during wet soil conditions can also become more susceptible to compaction and rutting. If possible, construction activities should take place during the dry summer months and be completed by early fall, when soil moisture levels are anticipated to be low.

During periods of excessive rainfall or saturated soil conditions, construction activities should be monitored to ensure that excavated soils remain on-site and do not migrate off the work area. If excessive amounts of rain continue to fall, excavated soils should be secured by the use of silt fencing enhanced with straw bales where appropriate.

Erosion associated with high winds, resulting in soil loss and nuisance dust, can be reduced or eliminated by stabilizing spoil piles with straw mulch. Applying a low energy water spray to the work area can temporarily control nuisance dust.

If the mitigation measures recommended to reduce the impact of the inclement weather are followed, there should be no adverse environmental effects from climatic events that occur during construction.

6.1.4 Seismicity***Potential Impacts***

The Final Route is in zone 1 of the seismic ground motion zones with respect to relative seismic risk (Natural Resources Canada, 2005a; Natural Resources Canada, 2005b). The probability of significant seismic activity in the area traversed by the proposed pipeline is extremely low.

Mitigation and Protective Measures

Since seismicity is not a concern along the Final Route, mitigation and protective measures have not been developed.

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6.1.5 Hydrology***Surficial Watercourses******Potential Impacts***

There are no natural watercourses and several municipal drains in the Study Area. The Final Route crosses one municipal drain, Arnold Drain and runs parallel to Laur Drain, as described in **Appendix C2**.

Across the Study Area, Arnold Drain follows an east/west route running parallel to Moore Road 6. It commences just east of the area where the Final Route crosses it and ends at Ladysmith Road. This drain is a combination (open/closed) drain where an open ditch catches surface runoff which infiltrates to enter a buried 12-inch (305 mm) diameter tile that flows west. As discussed, the Study Area is extensively tile drained. In general, tile drains mirror the surface elevations and flow directions. The Arnold Drain flows west and outlets into the Coyle Drain. Except during rainfall events, the open drain does not hold water. Should flowing water be present at the time the crossing is proposed, Arnold Drain is recommended to be crossed using the dam and pump watercourse crossing method outlined in the MNR's Generic Sediment Control Plan.

The Laur Drain parallels the fenceline which divides Concessions VII and VIII. This open drain flows from the east, and outlets into Jarvis Drain. The drain has an average depth of 1.5 m. Except during rainfall events, the open drain does not flow or hold standing water. The Final Route travels parallel to the west side of Laur Drain and therefore will not cross the drain.

There is the potential for water quality to be affected during construction of the pipeline through the following means:

- Accidental spills, from construction vehicles working in or adjacent to the watercourses and due to inappropriate handling or storage of fuel, dust suppressants, lubricants, or other potential contaminants; and,
- Unavoidable removal of stabilizing vegetative cover.

Specific issues related to hydrostatic testing are discussed in **Section 7**.

Mitigation and Protective Measures

General mitigation measures to protect the watercourses during pipeline construction are provided below and on the mitigation mosaics (**Appendix D**). The bored crossing method is anticipated to be used for the Arnold Drain, and will be incorporated into the bored crossing of Moore Road 6. No impacts to Laur Drain are anticipated and as such, no mitigation measures have been developed.

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Prior to construction, the contractor must obtain adequate quantities of the materials listed below in order to control erosion and sediment deposition. Additional supplies, as dictated by the Environmental Inspector, should be maintained onsite in a readily accessible location for maintenance and contingency purposes. Required supplies may include:

- Silt fencing;
- Straw bales;
- Wooden stakes;
- Sand bags;
- Water energy dissipater;
- Filter cloth;
- Water pumps (including stand-by pumps and sufficient lengths of hose); and,
- Snow fencing with sufficient quantities of t-bars.

Prior to construction, silt fencing must be erected at the discretion of the Environmental Inspector. Silt fencing must be properly keyed-in and maintained at all locations in order to work effectively and achieve maximum sediment control. Silt fencing must be inspected on a daily basis for wear and tear. Damaged or worn silt fencing must be replaced immediately.

To minimize effects on fish and fish habitat, the pipeline is planned for construction when the surface drains in the area are typically dry. If flowing water is present in a drain at the time of the crossing, the dam and pump water crossing technique must be implemented following the approved MNR Generic Sediment Control Plan, and permits might be required from the SCRCA.

Groundwater***Potential Impacts***

There are two residential homes situated within 100 m of the Final Route. These homes are serviced by a municipal water system.

There is one well within 100 m of the Final Route. It is classified as having fresh water and being used for livestock (MOE, 2005). The static water level in this well is 8.5 m (MOE, 2005).

Mitigation and Protective Measures

Although not anticipated due to the alignment of the Final Route, if a high water table is encountered in isolated areas during trench excavation, dewatering may be required. Associated dewatering should be discharged in a vegetated, non-agricultural area, or into a filter system to eliminate ground scouring. An MOE Permit to Take Water is required if more than 50,000 L/day is withdrawn as a result of dewatering activities.

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Fuels, chemicals, and lubricants should be stored on level ground in properly contained/sealed storage areas. Refuelling activities should be monitored at all times; vehicles should never be left unattended while being refuelled. In the unlikely event of a spill, the MOE Spills Action Centre should be contacted, and spills containment and clean-up procedures implemented immediately.

Potential for effects to groundwater quality and quantity along the Final Route is moderate because for much of the route there is an adjacent drain where the water-bearing zone may occur within the potential zone of impact for normal pipeline trenching operations. With proper implementation of these measures, construction related activities should have no significant adverse effects upon hydrology along the Final Route.

6.2 AGRICULTURAL FEATURES

6.2.1 Surficial Soils

Potential Impacts

The pipeline alignment traverses agricultural land. Disturbance of agricultural soils is anticipated to occur as a result of pipeline construction. Pipeline construction during wet months or extended periods of heavy rainfall could have negative impacts on agricultural lands. The movement of heavy machinery on wet soil may cause deep rutting, severe compaction, and mixing of topsoil and subsoil. These potential impacts may break down soil structure and affect soil fertility thereby reducing soil productivity.

During construction, soils are more prone to erode due to the loss of vegetative cover. The degree of erosion is also affected by the intensity and duration of rainfall events, soil moisture, surface soil cover, slope, soil texture, structure, and organic matter content.

Soils that are disturbed during construction of the proposed pipeline are a valuable resource for rehabilitation and reclamation of the disturbed construction area following pipeline construction.

Improperly salvaged topsoil can result in topsoil and subsoil mixing, compaction, rutting, and excessive erosion. This can potentially affect re-vegetation of the construction area and potentially decrease crop yields.

Mitigation and Protective Measures

Where agriculturally productive lands are impacted by heavy rainfall events and wet soil conditions, construction should be suspended, in accordance with Enbridge's WSSD Practice, until suitable soil conditions return. When wet soil conditions occur, heavy tracked and rubber-tired vehicles should be restricted from movement on the pipeline right-of-way. Construction during wet soil conditions can result in unnecessary mixing of topsoil and subsoil, as well as surface erosion by water. Soil also becomes more susceptible to compaction and rutting during these conditions. A Soil Inspector should be present to deem soils sufficiently dry for

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construction. As construction is scheduled to occur during dry summer months, impacts associated with wet climatic conditions are reduced. This period will ensure that construction will occur during the driest time of the year and that environmental impacts associated with wet soils would be minimal.

On agricultural lands, topsoil and subsoil should be stripped and stockpiled separately to avoid topsoil/subsoil mixing. Topsoil stripping methods should ensure adequate separation of topsoil and subsoil stockpiles. Colour and texture changes between the topsoil and subsoil interface should be monitored to ensure proper stripping occurs. Topsoil should be stockpiled for use during rehabilitation and reclamation of the agricultural land.

Where subsoil has been compacted by heavy construction equipment, appropriate compaction relief, by means of an agricultural subsoiler prior to replacing the topsoil, may be necessary. In high traffic areas of the right-of-way, soil compaction may occur to depths greater than 45 cm – 60 cm and additional deep tillage or subsoiling may be required on a site-specific basis. Soil density and/or penetrometer measurements on and off the right-of-way may be used as a means of assessing the relative degree of soil compaction.

Where agriculturally productive lands are not affected, and the pipeline is located entirely within utility corridors, it is not necessary to separate topsoil. It is expected that heavy equipment traffic and movement will not result in extensive compaction of the previously disturbed utility corridor soils. It is recommended that soil conditions along the Final Route be monitored throughout construction, especially in areas where erosion may occur.

Where erosion develops or is evident, silt fence and straw bales should be installed to reduce soil transport. Reseeding should occur as soon as possible following installation of the pipeline when climatic conditions permit.

6.2.2 Artificial Drainage

Potential Impacts

Artificial drainage mapping obtained from OMAFRA confirmed that tile drained fields will be traversed by the proposed pipeline route. Both random and systematic tile drains will be encountered. Where tile drainage infrastructure is encountered during construction, tile operation and performance can potentially be affected. Temporary or permanent disruption of water flow caused by severed or crushed tiles could result in soil erosion or crop loss due to flooding. The location of artificially tile-drained fields is indicated on **Figure C1-3, Appendix C1**.

Mitigation and Protective Measures

A drainage contractor or specialist should be contacted prior to construction to advise on any issues related to potential impacts to agricultural drains. Landowners should be contacted to determine the precise location of the tile system prior to construction. Future plans for improvements to farm drainage should also be identified and discussed.

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Tile drains severed during trenching must be recorded, flagged, and repaired immediately following the backfilling of the trench. If a main drain, header tile, or large diameter tile is severed, a temporary repair should be made to maintain field drainage and prevent flooding of the trench and adjacent lands. Severed tile drains that are not immediately repaired should be capped to prevent the entry of soil, debris, or rodents.

After the repair of each severed tile, and prior to backfilling, landowners should be invited to inspect and approve the repair. If flooding of fields occurs as a result of a severed tile and subsequently soils are damaged or crops are lost, the impacted area should be rehabilitated as soon as possible.

6.2.3 Soybean Cyst Nematode

Potential Effects

While its presence has not been confirmed in agricultural lands traversed by the Final Route, the soybean cyst nematode (SCN) is known to have infested several agricultural fields in southwestern Ontario. Once a field has been infested, there is significant potential for soybean crop loss (Olechowski, 1990), and the concern is that "there is no effective method of eradicating SCN". During pipeline construction, equipment will be transported from field to field and, under certain circumstances, equipment will be "floated" or transported from one section of the route to another. If a field is infested with the soybean nematode, there will be potential for transporting it to non-infested fields if soil remaining on construction equipment contains SCN, or infested soil is imported to adjacent properties.

Mitigation and Protective Measures

A pre-construction soil-sampling program should be implemented to identify fields traversed by the Final Route that are infested with SCN. This program will provide contractors with the location of properties that may be of concern during construction. The pre-construction program should include soil analysis of each field to determine the extent of SCN infestation along the Final Route alignment.

The pre-construction soil sampling program should include the collection of one composite sample from each field crossed by the Final Route. A composite sample consists of approximately 0.5 kg total from 10 to 15 sub-samples of topsoil collected systematically, for the length of each field along the right-of-way. The sub-samples should be collected to a depth of 15 cm to 20 cm with a narrow shovel, trowel, or soil probe. The composite sample collected from each field should be sent to a laboratory capable of testing for SCN, as soon as possible, or should be kept cool (not frozen) and sealed to minimize moisture loss until analysis can be conducted.

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Any fields that are impacted with SCN should be recorded on Enbridge's line list that in-turn should be provided to the Construction Contractor. Landowners whose properties are infested with SCN should be advised of the infestation and provided with the OMAF "Fact Sheet" - Order #90-119 (Olechowski, 1990).

Additionally, any imported topsoil should have a composite sample analyzed for SCN before it is placed on the right-of-way.

If SCN fields are identified along the Final Route, appropriate mitigation measures should be developed. Examples of mitigation measures may include:

1. Remove soil from equipment before moving to fields that have not been infested by SCN during construction. This may involve thorough washing of equipment before transporting it from an infested to a non-infested field. This is especially important, if equipment is "floated" (i.e. moved by trailer) from a field with a positive SCN indication to a field without SCN.
2. Start construction activities on non-infested fields first. Equipment from non-infested or less-infested fields (as determined from soil analysis) could be moved to more infested fields but not vice-versa.

With implementation of these recommendations, no significant adverse effects upon crop yield resulting from SCN infestation are anticipated.

6.3 BIOPHYSICAL FEATURES

6.3.1 Watercourses and Fisheries

Potential Impacts

The Final Route crosses the Arnold Drain and runs parallel to the Laur Drain. Water does not flow in these drains except during and following rainfall events, however, at roadsides and isolated low spots these drains may contain standing water. There has been no assessment of these drains with regards to their potential to support fisheries.

The primary concern regarding potential effects of pipeline construction on fish and fish habitat is species viability and potential impacts to spawning/nursery activities.

Mitigation and Protective Measures

The bored crossing method is anticipated to be used for the Arnold Drain, and will be incorporated into the bored crossing of Moore Road 6. If water is present at the time of construction, the following mitigation measures should be followed for all watercourse crossing types when constructing in or near fish habitat. These actions should be completed in accordance with the MNR Generic Sediment Control Plan where necessary:

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- Water crossings should be constructed during the summer months, when fish are not migrating or spawning, and water flow is low;
- Prior to removal of the vegetation cover, effective mitigation techniques for erosion and sediment must be in place to protect water quality. Limit disturbance to the area during construction and delay grubbing activities until immediately prior to grading operations;
- Materials removed or stockpiled during construction (e.g. excavated soil, backfill material) must be deposited and contained in a manner to ensure sediment does not enter the watercourse;
- There must be no fording of any flowing stream;
- Except during construction, Enbridge will not obstruct any watercourse in a way that impedes the free movement of water and fish;
- All exposed mineral soil must be graded to a stable slope and treated as quickly as possible to prevent erosion and sediment from entering the water; and,
- Enbridge is to ensure that additional materials (e.g. rip rap and silt fencing) are readily available in case there is an urgent need for erosion and sediment control.

6.3.2 Forest and Vegetation Cover***Potential Impacts***

The Final Route alignment traverses approximately 9,100 m² of woodlot, while paralleling an existing hydroelectric transmission corridor as shown in **Figure C1-4, Appendix C1**.

The Final Route crosses one road. In order to ensure safe sightlines and stable grades, road allowances are continually maintained. Grass and brush cutting, pesticide spraying, and salt deposition are common occurrences. As a result, vegetative cover within road allowances generally consists of common and hardy plant species that are adaptable to disturbed environments. These species can be anticipated to be encountered when the Final Route approaches the road.

Mitigation and Protective Measures

When designing and planning the right-of-way for the Final Route, Enbridge should consider the minimum width required to facilitate construction. Specifically, Enbridge should give consideration to clearing the least amount of trees as possible.

To minimize the extent of disturbance to forest and vegetation cover, vehicle movement and equipment storage should be confined to the right-of-way areas.

It is anticipated that a quick recovery of herbaceous ground cover will result due to natural in-growth from adjacent areas. The seed mix, fertilizer, and application rates should be determined prior to initiation of construction. Should any trees require to be cut, Enbridge will implement their Tree Replacement Program.

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6.3.3 Wetlands***Potential Impacts***

The Final Route for the proposed pipeline does not impact any provincially significant or municipally designated wetland areas.

Mitigation and Protective Measures

Since no provincially significant or municipally designated wetlands are affected along the Final Route, no mitigation or protective measures are necessary.

6.3.4 Natural Heritage and Areas of Natural and Scientific Interest (ANSIs)***Potential Impacts***

The Final Route for the proposed pipeline does not affect any provincially recognized natural heritage areas, ESAs or ANSIs.

Mitigation and Protective Measures

Since no provincially recognized natural heritage or environmentally significant areas are crossed along the Final Route, no mitigation or protective measures are necessary.

6.3.5 Wildlife***Potential Impacts***

Due to the presence of woodlots, watercourses, and fencelines in close proximity to the Final Route, opportunities for bird, mammal, reptile or amphibian habitat exists. Species that could possibly be encountered during construction include white-tailed deer, raccoons, groundhogs, squirrels, skunks and various bird species.

As discussed in **Appendix C2**, a review of the NHIC (2005) and National Species at Risk (Environment Canada, 2004) databases identified 17 rare or at-risk wildlife species that could possibly inhabit the Study Area. The exact location of rare species is kept confidential, no rare or significant species are affected by the Final Route alignment.

Mitigation and Protective Measures

No rare or significant wildlife species are anticipated to be encountered during construction. In the event that significant species are encountered during construction, Enbridge should cease construction of the affected portion of the pipeline and consult the MNR regarding appropriate protective measures.

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6.4 SOCIO-ECONOMIC ENVIRONMENT

6.4.1 Municipal Structure

Potential Impacts

The Final Route crosses agricultural lands, two rural homes are situated within 100 m of the proposed pipeline alignment. According to MOE records, there is one well within 100 m of the Final Route (MOE, 2005).

After short-term disruption and use of municipal roads during the construction phase, it is expected that the overall impact to this area will be positive. The anticipated municipal taxes paid by Enbridge on an annual basis will be a significant long-term economic benefit of the pipeline. The amount of these taxes has not yet been determined, but will be based upon provincial assessment standards for the length of the pipeline.

While the increased number of personnel present in the area during pipeline construction will demand some services from the local municipality, the demand is expected to be minimal and short-term. Once the pipeline is in operation, it will require minimal municipal services.

Mitigation and Protective Measures

Typically, well locations cannot be precisely identified based on well records alone. The presence of recently drilled or non-documented water wells will be investigated with landowners and corridor tenants along the Final Route prior to construction. Prior to construction, Enbridge should retain the services of a hydrogeologist to identify the wells that require monitoring.

Prior to commencing construction of the proposed pipeline, Enbridge should consult with municipalities to identify specific concerns and potential mitigation measures to eliminate present and future problems. Concerns expressed during construction and operation of the proposed pipeline by affected municipalities should be addressed in an expeditious and courteous manner.

No significant adverse impacts on municipal structure are anticipated.

6.4.2 Existing Linear Facilities

Linear facilities that may be affected along the Final Route include: roads, telecommunication and hydroelectric transmission lines.

Potential impacts include limitations to access to business properties, emergency vehicle access and general impedance to traffic. The potential also exists for the temporary disruption of services such as telephone and electricity due to accidental severance of these services during trench excavation.

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Roadways***Potential Impacts***

The Final Route crosses one road allowance, Moore Road 6. Working near roads presents a different set of potential impacts as compared to cross-country construction. Impedance to vehicle transportation is the largest potential impact to residents, businesses and vehicles using the roadways.

Road crossings represent the construction activity with the most potential to disrupt traffic flow. The potential impact of constructing within the road allowance and road crossing includes the temporary disruption of traffic flow throughout construction. Typically, the bored crossing method is used for paved roads with mid to high traffic volumes. This is the crossing method planned for Moore Road 6.

Mitigation and Protective Measures

The road crossing is recommended to be bored. This method is commonly used when there are existing utilities within the road allowance, and when there are medium to high levels of traffic. When installation is complete, the road should be returned to its original condition or better. Enbridge should meet with the Township of St. Clair Road Superintendent to address the following issues:

- Deterioration of local roadways due to increased traffic;
- Final method of road crossing;
- Crossing procedures including resurfacing or grading of roadways, and traffic safety;
- Road restrictions and haul routes; and,
- Road surface and municipal drain restoration.

To reduce the risk of vehicle accidents or pedestrian injury, warning signs and construction barricades should be erected at all areas of construction activity near the road crossing. Appropriate traffic control measures should be used if construction activity occurs before dawn or after dusk.

Although a short-term disruption in traffic will result from construction of the proposed pipeline, no long-term significant adverse impacts on roadways are anticipated with proper implementation of the measures described above.

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Hydroelectric Transmission Lines***Potential Impacts***

Overhead wood pole electrical wires are located adjacent to most roads within the Study Area. They are located on the north side of the Moore Road 6 road allowance. These lines present the potential for accidental contact during construction resulting in injury or loss of services to local customers.

The Final Route will parallel a 115 kV hydroelectric transmission corridor for almost its entire length before crossing this corridor. When constructing pipelines in the vicinity of high voltage hydro corridors special design, construction, and maintenance requirements to mitigate the potential impacts of electrostatic interference, electromagnetic interference, and resistive interference are required.

Mitigation and Protective Measures

During construction, all machine operators should be informed that power lines are present overhead. Lines that may interfere with the operation of construction equipment should be identified with warning poles strung together with rope and suspended red flags. Signs should be posted along the alignment of the Final Route stating "Danger - Overhead Power Lines." The final alignment of the Final Route should consider the location of existing utility poles and their supporting guy wires.

The most effective way to mitigate construction within a high voltage hydro corridor is by increasing the separation distance between the pipeline and the transmission line. When this is not feasible, special monitoring and grounding procedures must be followed to prevent electrostatic voltage from reaching levels where it presents a shock hazard to workers who may contact any large, insulated metallic objects including coated pipe joints, rubber-tired vehicles, etc.

An induced voltage may be developed along any pipeline that parallels a high-voltage transmission line, depending on separation distance. The induced voltage can present a shock hazard to anyone contacting the pipe (or appurtenances). Induced voltage can damage the pipe, the coating, insulating flanges and interfere with the cathodic protection system. Unlike electrostatic interference, inductive interference does pose a risk once the pipeline is buried and in-service. To prevent a shock hazard, the pipeline design must include special grounding facilities at any location (e.g., valve, Cathodic Protection test post, In Line Inspection launcher/receiver) where workers may come in contact with the pipeline. Additionally, the cathodic protection system must be designed so that the induced voltage does not compromise the effectiveness of the system meant to provide corrosion protection.

Resistive interference is potentially the most damaging to a pipeline. High-voltage transmission systems can create large fault currents (thousands of amps) during a failure, which may travel along any pipeline in the vicinity. These currents can be very destructive, leading to coating

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damage and in some cases pipeline failure. Special grounding techniques can be used to mitigate resistive interference but not eliminate them.

Pipelines, Sewers, and Water Mains***Potential Impacts***

The Final Route crosses two natural gas pipelines and various buried utilities. Telephone, water, and natural gas pipelines are located along roadways in proximity to the Final Route. Careless trenching activities during construction may affect the operation of existing buried utilities. Heavy machinery crossing these utilities may potentially impact the integrity of the pipelines and disrupt their operation. Severing any of these utilities would result in disruptions to a number of residents and businesses.

Mitigation and Protective Measures

Prior to construction, Enbridge must coordinate with the appropriate agencies to determine the location of all buried utilities, and potential future utilities, in areas of excavation and construction activity. Heavy machinery should cross underground utilities to the least extent possible. All heavy machinery operators should be advised of the location of all buried utilities and the concerns associated with construction in their vicinity.

6.4.3 Population and Institutional Facilities***Potential Impacts***

As discussed in **Section 6.4.1**, a small portion of the Final Route comes in close proximity to rural residences. It is within 100 m of two rural homes.

During construction, residents may experience a temporary disruption in the use and enjoyment of their property. Disruption in the enjoyment and use of property that may occur during construction may result from noise, dust, or additional traffic volume.

Mitigation and Protective Measures

Enbridge should address concerns expressed by residents and businesses in an expeditious and courteous manner. Prior to construction, Enbridge should provide residents and businesses along the Final Route with a construction communication procedure and every reasonable effort should be made by Enbridge to address concerns and maintain good landowner relations.

Measures for reducing noise and dust on the affected properties, and post-construction landscaping requirements to replace or repair laneways should be taken.

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Should landowners express concerns during construction or operation of the pipeline, every effort should be made by Enbridge to address concerns and maintain landowner relations.

To minimize inconveniences brought on by excessive noise, all engines associated with construction equipment should be equipped with mufflers. Nuisance dust can be minimized by proper maintenance of road surfaces. Traveled surfaces should be kept moist during excessively dry and/or windy conditions by frequently applying a low energy water spray. Road surfaces should be cleared of debris as required.

Public safety is a primary focus of Enbridge. Safety issues, both perceived and real, can be mitigated by implementing the standard proven safety measures during construction, ensuring that the pipeline is constructed and operated in accordance with all applicable codes and regulations, and monitoring pipeline integrity once it is in service. Enbridge should continue landowner relations through construction and operation of the proposed pipeline.

The proposed pipeline will be constructed and operated in accordance with the applicable CSA's O Reg. 210/01 which adopts CSA's Z662 *Oil and Gas Pipeline Systems*, and the Technical Standards and Safety Authority (TSSA, 1998) guidelines.

Health and Safety Risks are the primary focus in the CSA design codes that this project will adhere to for design, construction and operation. The pipeline will be constructed and operated safely, allowing mitigation of perceived risks by implementation of risk communication strategies during construction and operation.

6.4.4 Land Use

Potential Impacts

Routing of the proposed pipeline has minimized potential impacts to land use by locating the proposed pipeline along agricultural lot lines and by avoiding driveways to the greatest extent possible. The entire alignment parallels existing rights-of-way or fencelines. Construction should not significantly impact the management of agricultural properties through its duration. The duration of the entire construction period is expected to be less than four weeks.

Short-term impacts associated with disturbance, disruption, or loss of use may occur during construction due to noise, dust, or additional traffic volumes. Residents and businesses may experience a temporary disruption in the enjoyment and use of their property during pipeline construction.

Construction activity and construction crews may pose an undesirable presence during pipeline construction. Furthermore, increased traffic along municipal roads may increase potential for vehicle accidents. Residents may experience occasional inconveniences where local purchases and pipeline purchases are from the same retail outlet. A temporary increase in economic activity, particularly at local restaurants, can be expected during pipeline construction.

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While the Final Route avoids direct impacts on urban areas, it does lie close to four rural residential homes and farm business operations. Dust, noise, or disruption related to construction can be expected to dissipate within 100 m of the construction area. Consequently, a 100 m distance was used as the environmental and socio-economic inventory boundary within which most features were identified. On occasion, noise and dust effects are anticipated to inconvenience each of the two rural residential homes that are within 100 m of the Final Route.

Safety issues, both perceived and real, can be mitigated by implementing proven safety measures during construction, ensuring that the pipeline is constructed and operated in accordance with all applicable codes and regulations, and monitoring pipeline integrity once it is in service.

Traffic safety planning, barriers to public access to construction sites, and other construction safety measures should be in place and minimized during construction. Signs indicating the presence of a buried pipeline should be placed at all road and waterway crossings.

The Enbridge Chief Inspector and Lands representative will be available to assist in maintaining good relations throughout construction and operation of the proposed pipeline. Concerns expressed during construction by residents in the area of the Final Route should be addressed in an expeditious and courteous manner.

To minimize inconveniences brought on by excessive noise, all engines associated with construction vehicles should be equipped with mufflers. Where possible, noise levels arising from equipment should be below the maximum acceptable limits at the nearest residence as recognized by the MOE.

Construction activities that could create noise should be restricted to daylight hours and adhere to any local noise by-laws. If construction activities must be carried out which cause excessive noise outside of these time frames, adjacent residents and the appropriate municipality should be notified.

Occasional disruptions at construction access locations can be minimized by providing advance notice to local police, posting construction signs to warn oncoming motorists of construction activity, assigning a traffic control duty officer to assist with truck entry and exit where possible, and providing proper training, safety attire and equipment to the traffic control officer.

Another potential effect on land use is the temporary removal of livestock, or other, fences. Fences cut on, or adjacent to, the pipeline alignment should be reconstructed to their pre-construction condition.

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6.4.5 Waste Disposal and Potentially Contaminated Sites***Potential Impacts***

There is one active landfill in the Study Area. The Moore Landfill Site is located approximately 1 km north of County Road 80 (Courtright Line) at 3198 Ladysmith Rd in the Township of St. Clair. The 143 acre site, encompassing a landfill area of 21 acres accepts household and commercial waste from residents of the County of Lambton only. There are restrictions on the material allowed into the site, including: construction and demolition material; liquid or hazardous waste; industrial waste; field stones or concrete; tree stumps or limbs; dead animals or animal waste; and, ashes.

The pipeline trench could potentially act as a preferred pathway for contaminants to exit the landfill where sufficient down gradient does not exist.

Mitigation and Protective Measures

As explained in **Section 8.0** of this report, the County of Lambton is planning the decommissioning of the Moore Landfill to commence in the summer of 2007.

It is recommended that Enbridge consult MOE Guideline D-4 *Land Use On or Near Landfills and Dumps* when constructing the pipeline. There is one ground water monitoring well that is in close proximity to the Final Route alignment. According to information gathered since April 2000 by the County of Lambton there were slightly elevated levels of Aluminum, Iron and Manganese at this location. These levels have been steadily decreasing, and when last sampled on September 6, 2006, only Manganese existed at an elevated amount over the MOE Ontario Drinking Water Standard, Aesthetic Objective. At this time Manganese was measured as being 0.03ppm above the MOE guideline. The County of Lambton has advised that the pipeline alignment is far enough east of the landfill that no leachate impacts are anticipated. In addition, the County of Lambton has advised that the pipeline alignment is sufficiently downgradient from the landfill (County of Lambton, 2007) and therefore no mitigation measures will be required.

6.4.6 Heritage and Archaeological Features***Potential Impacts***

A Stage I archaeological assessment background study, completed for the Original EA (1993), resulted in the identification of no known sites. The fact that no sites were known to be located in close proximity to the 1993 Preferred Route resulted in a potential for unrecorded sites to occur, especially near historic transportation routes.

As a result of the Stage I findings, Archaeological Research Associates Ltd. (ARAL) undertook a Stage II archaeological assessment in 1992 to determine the presence of any archaeological resources that may exist along the 1993 Preferred Route. There were no sites found along the

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1993 Preferred Route. The study was undertaken in accordance with the Ministry of Culture and Communications guidelines for archaeological assessments.

To ensure that there had been no additional archaeological findings since the 1993 EA report, Stantec contacted John MacDonald from the Ministry of Culture in July 2006. He stated that if the Preferred Route changed from that in 1993, a Stage II Archaeological Assessment is recommended to be completed before construction can commence.

Mitigation and Protective Measures

Since the Final Route is approximately 15 m west of the 1993 Preferred Route, prior to construction, additional archival research and a Stage II Archaeological Assessment should be undertaken along the Final Route by a licensed archaeologist. The survey should be undertaken in accordance with the Ministry of Culture guidelines. The survey will serve to confirm the presence or absence of significant archaeological resources subject to potential impact from the proposed pipeline. In addition, the Stage II should determine the extent to which the inherent archaeological potential of the alignment has been degraded by previous disturbances. Recommendations for mitigation and protection, outlined in the Stage II report, should be implemented during construction.

If deeply buried cultural remains are encountered during construction, all activity should be suspended and the Heritage Operation Unit of the Ministry of Culture should be contacted to determine an appropriate course of action.

6.4.7 Land Claims***Potential Impacts***

As stated in **Section 4.2.4**, INAC replied to Stantec's information request on June 29, 2006. The letter notified Stantec that no specific claims have been submitted in the Study Area. However, they can only speak directly to claims filed under the Specific Claims Policy for the Province of Ontario. They suggested that the Comprehensive Claims Branch or the Litigation Management and Resolution Branch be contacted to receive information in regards to claims under Canada's Comprehensive Claims Policy or legal action by First Nations against the Crown.

INAC's Comprehensive Claims Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. Stantec was notified that there are no claims within the area southeast of Sarnia, and therefore the Study Area.

INAC's Litigation Management and Resolution Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. A map showing the Study Area was emailed to aid in the information request. A response was received on April 30, 2007 stating that there were active litigation cases in the vicinity of the Study Area. INAC stated that they could not comment with respect to the possible effect of these claims as the cases have

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not yet been adjudicated. INAC recommended consultation with legal counsel to determine the potential effects of these actions on the lands within the Study Area.

Copies of correspondence with First Nations are located in **Appendix B3**.

Mitigation and Protective Measures

There are First Nations claims within the Study Area, as such the ownership of the land is being disputed with regards to this claim. Enbridge should continue to work closely with the appropriate First Nations in the case that information regarding the land claim and affecting the routing of the proposed pipeline is brought forward by INAC.

6.4.8 Conservation Lands***Potential Impacts***

The Final Route traverses areas under the jurisdiction of the SCRCA. There are no Conservation Areas in the Study Area.

Mitigation and Protective Measures

Although the Final Route is located on agricultural lands, Enbridge should consult with the SCRCA to identify specific concerns and potential mitigation measures to eliminate present and future problems. Concerns expressed during construction and operation of the proposed pipeline by the SCRCA should be addressed in an expeditious and courteous manner.

6.5 PERMITS REQUIRED

Permits should be secured prior to construction of the pipeline. Permits may be required from federal and provincial levels of government.

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7.0 Hydrostatic Testing

The hydrostatic test is proposed to be completed for the entire length of the proposed pipeline. The required volume of water (approximately 925,000 L) may be obtained from either a municipal source or from the pond on the Tecumseh Compressor Station property. It is recommended that a municipal water source be used and in the event that municipal water cannot be used, the pond be used as the source if it can provide enough water to accommodate the volume required to fill the pipe.

When the hydrostatic test is complete, the discharge water is released. This water can be discharged into a municipal drain, with the Township of St. Clair and the SCRCA's approval, or potentially into the pond on the Tecumseh Compressor Station property.

The flow of the hydrostatic test water has the potential to impact downstream domestic users, as well as, fish, and aquatic and waterfowl habitats. An uncontrolled discharge of water from the hydrostatic test could cause downstream flooding, erosion or sedimentation. Other potential effects associated with uncontrolled discharge include the introduction of foreign aquatic organisms to a drainage basin and introduction of hazardous materials or pollutants to soils or bodies of water. Careless refuelling or failure of pumps that are adjacent to watercourses could result in watercourse contamination. In addition, the high pressures associated with testing could potentially endanger the general public or construction personnel in the event of line failure.

Nearby residents may experience temporary inconveniences related to noise associated with the operation of pumps utilized to fill the pipeline with test water, as well, lighting may inconvenience residents if pumping and testing continues into the night.

A Permit to Take Water from the MOE must be obtained should water be withdrawn from a natural source and the volume exceeds 50,000 L/day. Prior to the withdrawal of water from a municipal source, the Township of St. Clair should be contacted to confirm the maximum rate of withdrawal.

Temporary lighting should be turned on at dusk and extinguished at dawn. Lighting should be directed towards the work site but away from the direction of any nearby residences. To reduce noise levels all pumps should be properly muffled.

The MOE and the SCRCA should be consulted to determine the discharge method of the hydrostatic test water. To reduce the potential for erosion and scouring at dewatering points, appropriate energy dissipation techniques should be utilized. At all dewatering points, discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking during surging. The rate of discharge should be monitored to ensure no erosion or flooding

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occurs. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or ceased until satisfactory mitigation measures are in place.

8.0 Cumulative Effects

Policy makers are increasingly seeing Cumulative Effects Assessment (CEA) as representing a *best practice* for effects assessment (IAIA, 1999). Consequently, the recognition of CEA as a best practice is now reflected in many provincial regulatory documents. With regard to development of hydrocarbon pipelines in Ontario, this best practice principle is reflected in the *OEB Guidelines (2003)*, Section 4.3.13, which notes that Cumulative Effects (CE) of pipeline construction should be identified and discussed in the EA as an integral part of the assessment.

Building upon the intent of the *OEB Guidelines (2003)*, the OEB issued a decision regarding Leave to Construct a new pipeline system to serve a proposed generation facility in Southern Ontario (RP-2005-0022). The OEB (2006) specified that only those effects that are additive or interact with the effects that have already been identified as resulting from the pipeline construction are to be considered a CE. If the environmental impacts are compounded, it will be necessary to determine whether these effects warrant mitigation measures such as alterations in routing, timing of construction or other measures that can address the cumulative impacts.

This CEA has been prepared with consideration of this recent direction from the OEB.

8.1 METHODOLOGY

This CEA describes the potential CE of pipeline construction in combination with the existing environment and the effects of unrelated existing or approved projects that have a high likelihood of proceeding. CEs include the temporal and spatial accumulations of change that occur within an area or system due to past, present, and future activities. Change can accumulate within systems in either an additive (*i.e.* cumulative) or interactive (*i.e.* synergistic) manner.

In terms of CEA methodology, it is generally accepted that due to the uncertainty and complexity of CE, no standard method of assessment exists. There are two distinct approaches to CEA: i) analytical and ii) planning. Analytical approaches focus on information generation using evaluation tools such as research design and scientific analysis, whereas planning approaches extend beyond analysis, applying planning principles and procedures to set values and address multiple objectives.

Selection of an appropriate approach and evaluation tools depends upon the objectives and issues surrounding the CEA. For construction of the proposed pipeline, the OEB suggests the use of a planning based approach. By applying the best practice principles of avoidance, minimization, and compensation to limit project-specific effects (**Chapter 6**), potential adverse effects on socio-economic features and the natural environment have been greatly minimized prior to accounting for the effects of other unrelated projects (*i.e.* CEs).

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Specifically, this CEA methodology is designed to evaluate and manage the additive and interactive effects from the following sources:

- Existing infrastructure, facilities, and activities as determined from available data sets;
- The proposed pipeline and associated infrastructure as described in **Section 1.1** of this EA; and,
- Future activities where the undertaking will proceed, or has a high probability of proceeding.

This planning approach facilitates a landscape level analysis that supplements the regional analysis discussed in **Appendix C2**, and is consistent with recommendations to evaluate potential CE at various levels. This level of analysis allows the CEA to focus on the issues that are pertinent to the Project, to avoid the generation and evaluation of information that is of little diagnostic value.

8.2 STUDY BOUNDARIES

8.2.1 Spatial

The spatial study boundaries for the CEA were extended beyond the Final Route alignment. To make conservative assumptions about the magnitude and probability of possible effects, the original Study Area boundary that was used for the EA was also used for the CEA. The Study Area boundary is beyond the *zone of influence* of pipeline construction and operation activities (e.g. dust and noise), and consequently, the identified effects will have diminished to background levels. The Study Area is also considered conservative in terms of managing both effects and risks.

8.2.2 Temporal

The temporal boundaries for this CEA reflect the nature and timing of pipeline activities and the availability of information surrounding future projects with a high probability of proceeding. The Project schedule identifies three key milestone activities, including i) EA Update and technical design - 2007; ii) construction - 2008; and, iii) operation - 2008 through 2058. Fifty years of pipeline operation is used as an assumption for the purpose of this CEA, although the pipeline may be operational beyond fifty years. Based upon these milestone activities, three time periods were selected for evaluation in the CEA: 2007, 2008, and 2012.

Existing conditions were considered as those that existed and were identified during the EA Update process (*i.e.* 2007). In some cases, published data were not current to 2007 and thus the assessment relied on a combination of best available information, public input, and field investigations. The year 2008, covering post construction clean-up activities, was selected to represent the construction and reclamation period, and the year 2012 was selected to represent the operation and maintenance period. Forecasting beyond 2012 increases the uncertainty in predicting whether projects will proceed, and the effects associated with these unrelated projects.

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Although rare in occurrence, it is plausible that accidental or emergency events may arise due to an unforeseen chain of events during the pipeline's operational life. As a result of the rarity and magnitude of such events, they have not been assessed here, as they are extreme in nature when compared to the effects of normal maintenance activities, and require separate response plans. Pipeline retirement is another event that is beyond the temporal boundaries of this CEA and will not be assessed here.

8.3 ANALYSIS OF CUMULATIVE EFFECTS

Section 6 of this EA Update report considered the potential effects of construction and operation of the pipeline on specific features and conditions, and proposed mitigation measures to avoid or reduce the potential for impact. This CEA evaluates the significance of residual effects (after mitigation) of the construction and maintenance of the pipeline and pools along with the effects of other unrelated projects.

A number of agencies were contacted to determine the nature of any unrelated projects planned or scheduled in the Study Area that are in the final stages of implementation or approval. The agencies and companies contacted include:

- St. Clair Region Conservation Authority;
- County of Lambton;
- Township of St. Clair;
- TransCanada PipeLines;
- Union Gas Limited;
- Enbridge Gas Storage Operations;
- Ministry of the Environment;
- Ministry of Natural Resources; and,
- Rural Lambton Steward Group.

Construction activities associated with the development of the proposed pipeline, and its associated facilities, between 2007 and 2008, will include:

- Field investigations as required along the Preferred Route (fall 2007 through spring 2008);
- Mainline Construction - pipe installation, tie-ins, and commissioning (spring and summer 2008); and,
- Post construction clean-up activities (fall 2008).

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Existing, ongoing, or highly probable developments in the Study Area include:

- Decommissioning of Moore Landfill.
- Routine maintenance of Township roads; and,
- Routine maintenance of County roads.

8.3.1 Year 2007: Baseline Conditions

The Study Area lies in a rural section of the Township of St. Clair, County of Lambton. The soil capability for agriculture (CLI) rates most of the Study Area as Class 3. There are small polygons of Class 2 soils. As a result, the area is almost entirely comprised of prime agricultural land (Classes 1-3). As such, the land use in the Study Area is dominated by agriculture, which includes woodlots of various sizes. Existing farm operations have fields in various stages of crop rotation.

As discussed in **Section 3**, the forest region of the Study Area is Eastern Deciduous Forest. It is the northern extension of the large deciduous forest of the northeastern United States. Many of the trees found within the Study Area are at the northern limit of their range.

Enbridge's Tecumseh Compressor Station is situated in the north eastern section of the Study Area. There are many buried natural gas transmission pipelines within the Study Area, many of which connect to the Tecumseh Compressor Station. Additionally, there are three underlying natural gas storage pools in the Study Area comprised of access roads, wellheads, and gathering pipelines. These pools are Enbridge's Ladysmith Pool, and their Kimball-Colinville Pool, and Union Gas's Payne Pool. Union Gas also has a Compressor Station in their Payne Pool.

There are four rural roads in the Study Area. One is owned by the County of Lambton and three are owned by the Township of St. Clair. These roads are maintained and upgraded by their respective owners.

The Study Area watershed falls within the jurisdiction of the SCRCA and is subject to the SCRCA Regulations. There are no natural watercourses and several municipal drains which flow through or within the Study Area.

Enbridge operates and maintains a network of natural gas pipelines throughout the Study Area. The existing pipeline system has been operational for many years, and residual impacts on vegetation outside of pipeline right-of-ways no longer exist. Detailed environmental and socio-economic conditions within the Study Area are provided in **Appendix C2**.

Discussion

Since baseline conditions are from the pre-construction timeline, cumulative net impacts occurring during baseline conditions, within the Study Area, cannot be related to the Project. As mentioned above, the land use in the Study Area is dominantly agriculture, which creates

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potential impacts common to the agricultural industry such as: farm vehicles traveling on roadways, and soil sensitivity to compaction potentially affecting a decline in yield. These effects are expected to continue to be produced by farm operators during the construction period of the Project and further into the future, however, due to the progressive nature of the agricultural community, there are no net impacts anticipated from agriculture in the Study Area.

The four roads within the Study Area are not scheduled for upgrading but they are anticipated to be regularly maintained as required.

Mitigation methods during construction and operation were discussed in **Section 6** of this report.

8.3.2 Year 2008: Construction

Based on information provided by the agencies and companies contacted, there are three projects, unrelated to this proposed pipeline, which has been identified as having a high probability of proceeding concurrently with construction of the proposed pipeline.

Decommissioning of Moore Landfill

The County of Lambton is planning to decommission the Moore Landfill located on Ladysmith Road. Refer to **Figure C1-4, Appendix C1** for the exact location of this landfill.

Decommissioning of this landfill is planned to take place in the summer of 2007, however, it is possible that work may need to continue in the summer of 2008. A clay cap of approximately 1 m, most of which will be extracted from on site, and approximately 10 cm to 15 cm of topsoil which will be trucked in from off site.

Assessment of the potential environmental and socio-economic impacts associated with the decommissioning project is outside the scope of this study. However, noise, dust, and an increase in vehicular traffic on local roads related to this decommissioning project can be anticipated. The effect of this landfill decommissioning project to the prime agricultural land is anticipated to be negligible as it is expected to be within the boundaries of the Moore Landfill. There are no woodlots affected by this project.

Routine Maintenance of Township Roads

The Township of St. Clair routinely maintains the roads under their jurisdiction. Within the Study Area, there are three Township roads. During the construction period there is potential for the need to perform routine maintenance as required on those roadways.

In this instance an increase in noise and dust resulting from road maintenance can be anticipated, however it is expected to be very short-term in duration resulting in only a minor impact.

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Routine Maintenance of County Roads

The County of Lambton routinely maintains the single road in the Study Area that is under their jurisdiction. During the construction period there is potential for the need to perform routine maintenance as required on this roadway.

As with the Township roads, in this instance an increase in noise and dust resulting from road maintenance can be anticipated, however it is expected to be very short-term in duration resulting in only a minor impact.

Discussion

To consider the additive and interactive effects at their maximum intensity, this CEA assumes that construction of the Project, and each of the above noted projects would occur concurrently. An example of a potential CE could be increased noise and dust, resulting from construction vehicles using local roads.

Primarily, significant effects associated with construction of the proposed pipeline have been minimized through the route selection process and the recommended mitigation measures. By paralleling property lines, disruption to agricultural lands has been minimized, and restrictions to unplanned future development have been reduced. By limiting the Project-specific effects, the potential interaction of effects from construction of the proposed pipeline with other unrelated projects has been considerably reduced.

Noise and dust disturbances are localized and can be largely dissipated through mitigation. Once construction is complete, noise and dust will no longer be issues with these projects. The prime agricultural land will not be significantly affected by these projects. Therefore, the majority of the impacts associated with construction of the proposed project and interaction with the construction of other projects are considered to have no cumulative significance.

Vegetation removal, including loss of terrestrial habitat, is also considered short-term, as when construction is complete, the cross-country corridor will return to a natural terrestrial landscape. The effects of any vegetation impacts, will be minimized through careful pipeline alignment and implementation of Enbridge's Tree Replanting Program.

No CE is anticipated concerning archaeological resources because none are anticipated to be associated with the proposed pipeline, although a Stage II archaeological study will confirm this. The approval of the other proposed developments are also likely contingent on no archaeological resources being discovered.

Physical and chemical transport, on groundwater, surface water, and aquatic organisms, has not been included in this analysis because of the hydrologically isolated nature of the other projects and the proven success of the mitigation measures to be implemented during pipeline construction.

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Surface waters are not expected to experience any disturbance because of the extensive mitigation measures used to protect water bodies during pipeline construction.

A CE of low significance is the impact of multiple construction projects, such as the decommissioning of the Moore Landfill, routine road maintenance, and construction of Enbridge's pipeline occurring concurrently. Construction of these developments will result in the demand, both locally and regionally, for labour and project supplies such as food, accommodation, steel, gravel, and equipment. All projects, including the proposed pipeline are anticipated to have long-term effects on the economy through tax contribution to local governments, with limited demand on government services and resources, and their periodic demand for supplies and services.

8.3.3 Year 2012: Maintenance

In addition to pipeline maintenance activities, projects will inevitably take place within the CEA Study Area in the future. However, during Stantec's inquiries, other than routine maintenance of existing infrastructure and roadways, no projects were identified as being planned or scheduled. The lack of scheduled projects within the Study Area is not uncommon considering the small size and predominantly rural use of the Study Area.

Routine Maintenance of Township Roads

The Township of St. Clair routinely maintains the roads under their jurisdiction. Within the Study Area, there are three Township roads. During the operation period there are no planned road improvements; however, they intend to perform routine maintenance as required on those roadways.

In this instance an increase in noise and dust resulting from road maintenance can be anticipated, however it is expected to be very short-term in duration resulting in only a minor impact. This routine maintenance would have no effect on the surrounding agricultural land or local woodlots.

Routine Maintenance of County Roads

The County of Lambton routinely maintains the roads under their jurisdiction. Within the Study Area, there is one County road. During the operation period they intend to perform routine maintenance as required on those roadways.

As with the Township roads, in this instance an increase in noise and dust resulting from road maintenance can be anticipated, however it is expected to be very short-term in duration resulting in only a minor impact. This routine maintenance would have no effect on the surrounding agricultural land or local woodlots.

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Discussion

The proposed pipeline project, mostly located adjacent to the existing fence lines will be designed so as to minimize fragmented land parcels.

The proposed pipeline will affect limited vegetation removal in 2008 to facilitate construction. Vegetation removal, including loss of terrestrial habitat, is considered short-term because when construction is complete, the cross-country corridor will return to a natural terrestrial landscape. The effects of any vegetation impacts will be minimized through careful pipeline alignment and implementation of Enbridge's Tree Replanting Program.

Potential CEs to terrestrial fauna will diminish between 2007 and 2012, since re-establishment of trees will be underway and dust, noise, and other disturbances will be limited to very infrequent occurrences associated with maintenance activities.

Potential CEs to aquatic fauna are expected to be negligible because of the mitigation measures implemented during construction and the time elapsed for regeneration. Under these conditions, CEs should dissipate to the 2007 baseline conditions.

Taken collectively, the above CEs are expected to be low in magnitude by 2012. Consequently, no significant CEs are predicted based upon the available data and conservative assumptions made.

In addition to these effects, effects to the economy from the proposed project and the other projects might result in CEs of minimal significance. Each project will provide local governments with an additional tax base with limited demand on government services and resources. Periodic demand for supplies and services will also be experienced with each project.

8.4 SUMMARY

The potential CEs of construction and maintenance of the pipeline were assessed by considering other projects that have a high probability of commencing during construction of the proposed pipeline, or that may commence sometime in the future. The Study Area boundary was used to assess the potential for additive and interactive effects of the proposed pipeline and the other projects on environmental and socio-economic features. Given the limited spatial size of the proposed project, and the limited scale of projects proposed within the Study Area, the potential for CEs is considered to be insignificant.

9.0 Monitoring and Contingency Plans

9.1 MONITORING

The primary objective of compliance and effects monitoring is to ensure mitigation measures are effectively implemented and to measure the effects of activities associated with development on environmental and socio-economic features. Ultimately, the knowledge gained from monitoring is used to avoid or minimize problems during subsequent construction projects.

Previous pipeline construction experience, and review of post-construction monitoring reports from other pipeline projects, indicates that effects from pipeline construction are for the most part, temporary. The mitigation measures to reduce and avoid effects are well known and have been shown to be effective. With this in mind, Enbridge should adhere to the following general monitoring practices:

- Trained staff should be on-site to monitor construction and should be responsible for ensuring that the mitigation and monitoring requirements within this report are executed effectively. Enbridge should implement an orientation program for inspectors and contractor staff to provide information regarding Enbridge's environmental program and commitments, as well as Safety Education measures;
- Mitigation recommendations made in this report should be incorporated into the contract specifications;
- Contact between landowners and company liaison should be maintained to ensure that the concerns of landowners are quickly addressed; and
- An inspection of the route should be conducted approximately one and two years after construction to determine whether any areas require further rehabilitation.

9.1.1 Watercourse Crossing

An Environmental Inspector should be on-site during the boring of Arnold Drain to ensure adherence to specifications and site plans. In particular, the Environmental Inspector should ensure that pre-construction preparation is complete prior to commencement of work and that the floodplain conditions are restored to preconstruction conditions. The Environmental Inspector should be responsible for monitoring weather forecasts prior to the crossing.

Follow-up inspections, one year after construction following spring run-off, should be completed to review effectiveness of the bank and slope re-vegetation program, to check bank and slope stability and to ensure floodplain drainage has been maintained. Appropriate remediation measures should be completed as necessary, and additional follow-up monitoring should be conducted.

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9.1.2 Municipal Roads

The municipal road affected by pipeline construction should be restored to its pre-construction condition to the satisfaction of municipal engineers. Road Superintendents should be given an opportunity to inspect any repairs or modifications. Once re-established, the crossing location of the road should be monitored following heavy rain events and a year after construction following spring runoff, to ensure no road subsidence or major rutting has occurred and that the drainage system is functioning properly.

9.1.3 Vegetation

During pre-construction clearing and during construction, the Environmental Inspector should ensure that the contractor respects the limit of clearing and does not damage adjacent vegetation. The Environmental Inspector should identify, for removal, any trees that pose a potential hazard.

Establishment of vegetative cover should be monitored. Silt fencing and other protective measures should be retained in place until cover is fully established.

A year following construction, new woodlot edges should be inspected for any potential hazard trees. Planted trees should also be inspected for survival; in areas of severe dieback or in areas important environmental functions (e.g. riparian or slope cover), dead and diseased trees should be replaced. Enbridge's inspection program should include annual monitoring until a "free-to-grow" condition is reached.

9.1.4 Landowner and Community Relations Program

Social effects should be monitored through a communications program. As part of this program, all residents and absentee landowners affected by construction should be notified in advance of construction activities in their area. The notification should indicate the name and contact number of Enbridge's Project Manager and should invite the resident or landowner to contact the Chief Inspector should concerns arise.

The Chief Inspector should file a report detailing time and date of any call, the nature of the concern, the corrective action taken where appropriate, and the time and date of follow-up contact. The Project Manager should establish contact with the Township of St. Clair indicating the nature of the work to be undertaken, traffic management plans, and the size and origins of the workforce. In this manner, any traffic and security concerns will be brought directly to the attention of Enbridge's Project Manager for corrective action, and a report will be filed.

Following completion of construction, Enbridge should contact all residents along the right-of-way and continue ongoing communications where necessary. During the first two years, particular attention should be paid to monitoring and documenting any effects associated with construction and operation of the pipeline.

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9.2 CONTINGENCY

Contingency planning is necessary to prevent a delayed or ineffective response to unexpected events or conditions that may occur during construction of the proposed pipeline. An essential element of contingency planning is the preparation of emergency plans and procedures that can be activated if unexpected events occur. The absence of contingency plans may result in short or long term environmental effects and possibly threaten public safety.

Unexpected events requiring contingency planning that may occur during construction of any pipeline include: extreme climatic events, changes to the construction schedule, and human error. Although unexpected problems are not anticipated to occur during construction, Enbridge and the pipeline contractor should be prepared to take appropriate action quickly. The Environmental Inspector should identify situations where contingency plans should be implemented. The Contractor should also know when to immediately cease operations, for example in the case of watercourse siltation. All staff should be made aware of and know how to implement contingency emergency response measures.

9.2.1 Watercourse Siltation

Even with appropriately installed erosion and siltation control measures, extreme runoff events could result in collapse of silt fencing, slope or trench failures and other problems which could lead to siltation of watercourses. If siltation to a watercourse occurs, construction should cease immediately until the situation is rectified. Immediate action should be taken to install temporary measures to contain the extent of erosion and siltation as quickly as possible. Temporary protection measures such as silt fencing, sand bags, riprap, logs or planks should be utilized.

When site conditions permit, permanent protection measures should be installed on erodable surfaces including hydroseeding, erosion control matting, rip-rap, and willow staking. Additional layers of silt fencing or a more sturdy type of base fencing may be appropriate in erosion prone areas, until vegetative cover is established.

If siltation has occurred, due to a construction related activity (e.g. dewatering), the activity should be halted immediately until the situation is rectified. A supply of emergency materials (*i.e.* silt fencing, rip rap, shovels, *etc.*) should be available on-site. The Contractor should be fully prepared to respond quickly to siltation events.

9.2.2 Vegetation Damage

Potential for damage to vegetation situated adjacent to the Final Route increases during wet soil conditions. In the event of flooding and/or siltation of lands adjacent to the right-of-way, small swales should be hand dug to direct water away from the pipeline right-of-way. In areas where topography will not allow natural drainage, it may be necessary to use pumps to prevent prolonged standing water.

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If the Contractor damages woody vegetation beyond the identified limit of clearing, the Environmental Inspector should assess the damage and recommend appropriate measures. The Contractor should be shown the damage to ensure the problem does not reoccur.

9.2.3 Construction Delays

Delays in the construction schedule may be necessary due to field conditions, work progress or land acquisition issues. To minimize the impact of a construction delay, and if field conditions permit, equipment should be moved and construction should be resumed in a more suitable location. Once field conditions permit, construction should commence or resume at problem areas.

9.2.4 Accidental Spills

During construction, an accidental spill of construction fluids may occur. Fluids may include fuels, lubricating oil and grease, as well as, hydraulic fluids. Upon release of a hydrocarbon-based construction fluid, Enbridge should immediately determine the magnitude and extent of the spill and rapidly take measures to contain it. Release of sediment should also be treated as a potential spill depending on the magnitude and extent. All spills should be immediately reported to the Chief Inspector, Environmental Inspector and Enbridge's environmental department. If necessary, the MOE Spills Action Center should be notified at 1-800-268-6060.

A Spills Response Plan should be developed by the Contractor, reviewed with staff and posted in site trailers. Appropriate spill containment apparatus and absorbent materials should be available on-site, especially near water or sensitive wells. Staff should be trained in the use of spill containment equipment and materials.

9.2.5 Unexpected Finds**9.2.5.1 Heritage and Archaeological**

Every reasonable effort should be made to identify archaeological or heritage resources along the Final Route prior to construction. However, it is possible that such resources could be encountered along the route during construction. Should buried archaeological material and/or human remains be encountered during construction, construction in the vicinity should cease immediately. The Ontario Ministry of Culture and an archaeologist licensed in the Province of Ontario should be notified immediately. An appropriate site-specific response plan should then be employed following further investigation of the specific find.

9.2.5.2 Contaminated Sites

Efforts have been made to identify potential sites in the vicinity of the Final Route through a review of landfill records and contact with County of Lambton. Through circulation of the EA, the MOE will have further opportunities to review the route in the event that other unknown areas of potential contamination may exist.

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Regardless, the potential still exists for unknown material to be encountered during construction. If evidence of potential contamination is found, such as buried tanks, drums, oil residue or gaseous odour, construction should cease until the source of the material is further investigated. MOE must be notified if the source is not immediately obvious or containable in the opinion of the Environmental Inspector.

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10.0 Conclusion

This EA Update describes the process to select an appropriate route for the proposed Enbridge pipeline, and identifies and addresses potential impacts associated with the construction and operation of the proposed pipeline. Public input was integral to finalizing the Final Route and developing mitigation measures.

The Preferred Route was selected based on an environmental and socio-economic evaluation of the original alternate routes, construction and operational factors, and was presented at the Public Open House. Input from the public was received and used to confirm the Final Route selection.


In the opinion of Stantec, the recommended comprehensive program of mitigation, restoration, inspection, monitoring and contingency measures addresses all of the concerns raised during the public consultation process, as well as impacts, including potential CEs, identified during a detailed review of the Final Route (**Section 6**).

No significant adverse effects on environmental and socio-economic features are likely to occur as a result of the Enbridge pipeline project, with the implementation of the recommended mitigation measures and related programs. Furthermore, the mitigation measures presented are consistent with the construction of a 20-inch (508 mm) diameter pipeline.

Monitoring and contingency measures are important components of the mitigation program to ensure mitigation measures have been effective in both the short and long term. In addition, knowledge gained throughout this process can be used to better identify and prevent and/or rectify problems in the future.

The mitigation, inspection and monitoring, recommended additional studies and contingency programs outlined in **Sections 6, 7, and 9**, supported by Enbridge's construction specifications, practices and policies, should form part of the contract specifications. Pre-construction meetings and liaison between Enbridge staff and the contractor, Environmental Inspector(s) and landowners and agencies, and/or their representatives, should be conducted to ensure full understanding of responsibilities, importance of the various environmental issues and details regarding the measures proposed to address them. With the implementation of the recommended mitigation and related programs in conjunction with on-going landowner and agency communication and consultation, the adverse environmental effects of the proposed pipeline are not likely to be significant.

STANTEC CONSULTING LTD



David Wesender, Project Manager

**TECUMSEH COMPRESSOR STATION TO LADYSMITH NATURAL GAS STORAGE POOL
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11.0 Bibliography

County of Lambton. 2001. Township of St. Clair. Lambton County Planning and Development Department

Environment Canada. 2004. Geographic Query. Reviewed April 2007. Available:
http://www.speciesatrisk.gc.ca/map/default_e.cfm.

Hosie, R.C. 1975. Native Trees of Canada. Canadian Forestry Service. Department of the Environment. Ottawa.

Government of Canada. 1995. Fisheries Act. R.S. 1985, c. F-14.

International Association for Impact Assessment (IAIA). 1999. Principles of Environmental Impact Assessment Best Practice. IAIA: Fargo, U.S.A.

Natural Heritage Information Centre (NHIC). 2005. Geographic Area Query. Reviewed April 2007. Available: <http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic.cfm>.

Ontario Energy Board (OEB). 1989. Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario. Third Edition.

Ontario Energy Board (OEB). 2003. Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario. Fifth Edition.

Ontario Ministry of Natural Resources (MNR). 2002. *Overview of Ontario's Forests*. Reviewed November 2006. Available:
<http://ontariosforests.mnr.gov.on.ca/forestoverview.cfm#regions>.

Statistics Canada. 2001. Community Profiles. Reviewed May 2007. Available:
<http://www12.statcan.ca/english/Profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CD&Code1=3538&Geo2=PR&Code2=35&Data=Count&SearchText=Lambton%20County&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=&GeoCode=3538>.

Statistics Canada. 2006. Community Highlights. Reviewed May 2007. Available:
<http://www12.statcan.ca/english/census06/data/profiles/community/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=3538003&Geo2=CD&Code2=3538&Data=Count&SearchText=St.%20Clair&SearchType=Begins&SearchPR=01&B1=All>.

Technical Standards and Safety Authority (TSSA). 1998a. Guidelines for Development in the Vicinity of Oil and Gas Pipelines. Reviewed October 2005. Available:
<http://www.tssa.org/corporate/corporateResource.asp>.

Technical Standards and Safety Authority (TSSA). 1998b. Guidelines for Locating New Oil and Gas Pipeline Facilities. Reviewed October 2005. Available:
<http://www.tssa.org/corporate/corporateResource.asp>.

Appendix A

Figures



Base Map Source: Monteith and Southerland, 2002, Original Scale 1:6,100.

Metres 0 165 330
Scale 1:16,500

INDEX MAP OF
SOUTHERN ONTARIO

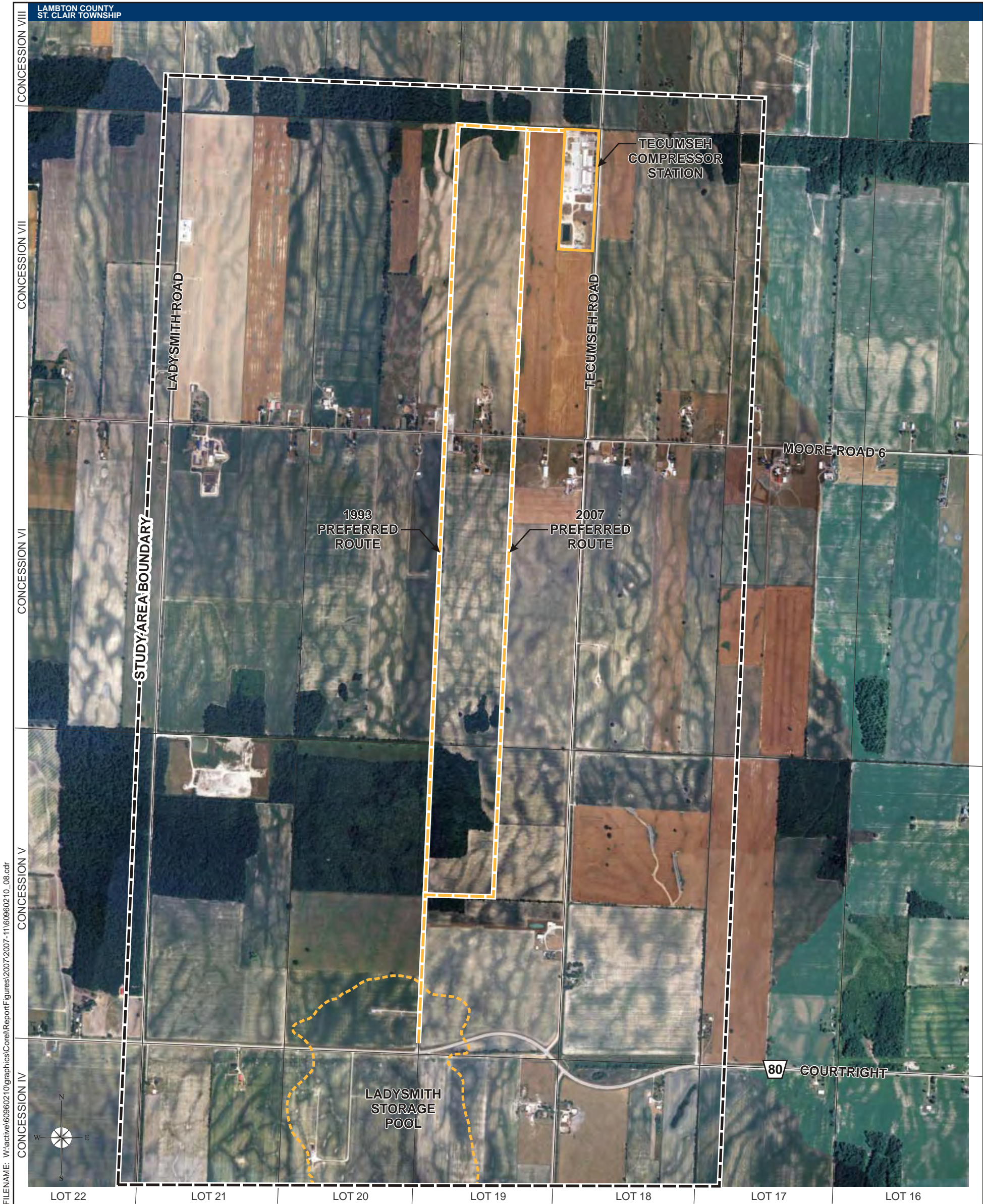


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| FIGURE NO. | |
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STUDY AREA



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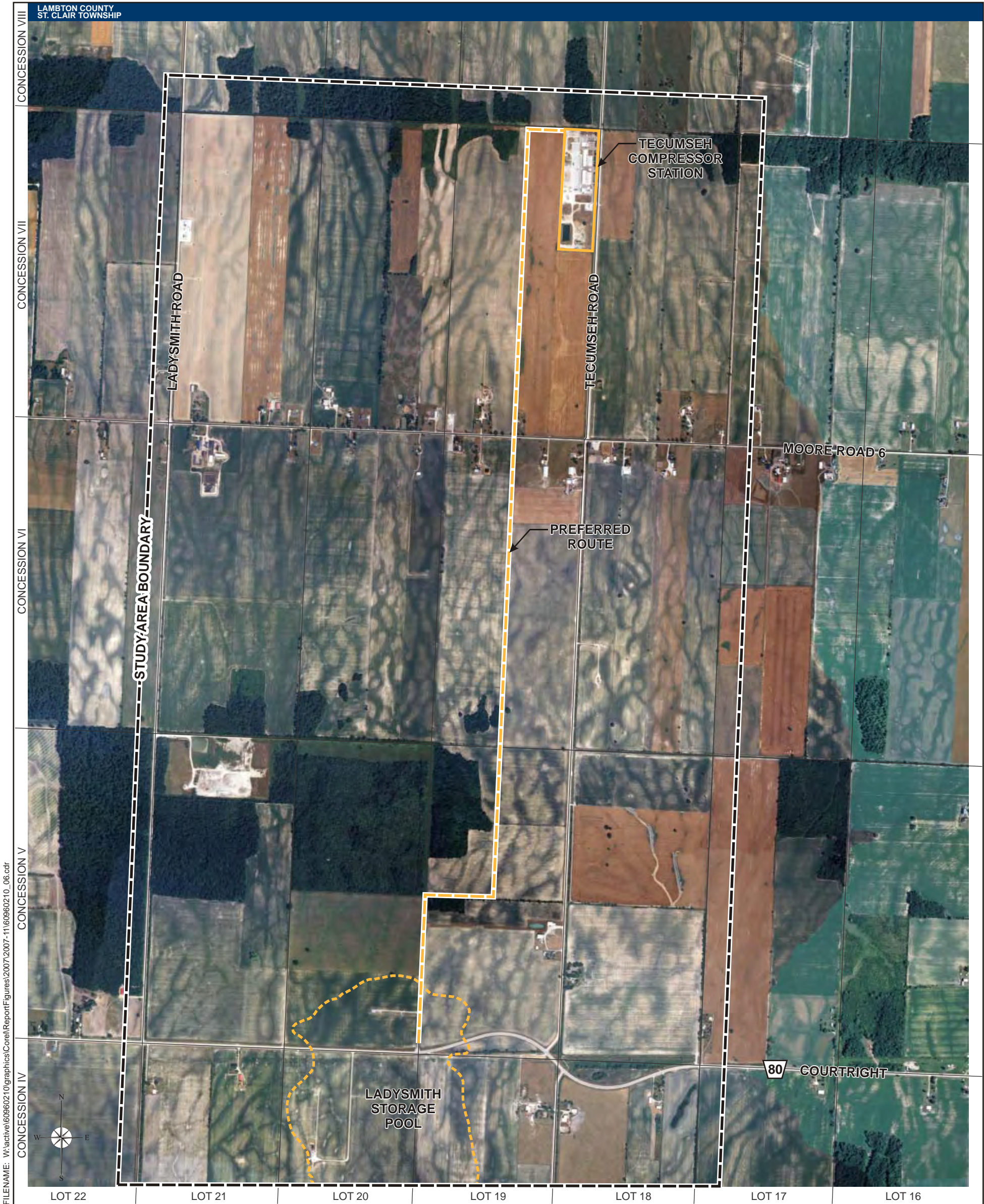
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| FIGURE NO. A1-2 | |

ALTERNATE
ROUTES

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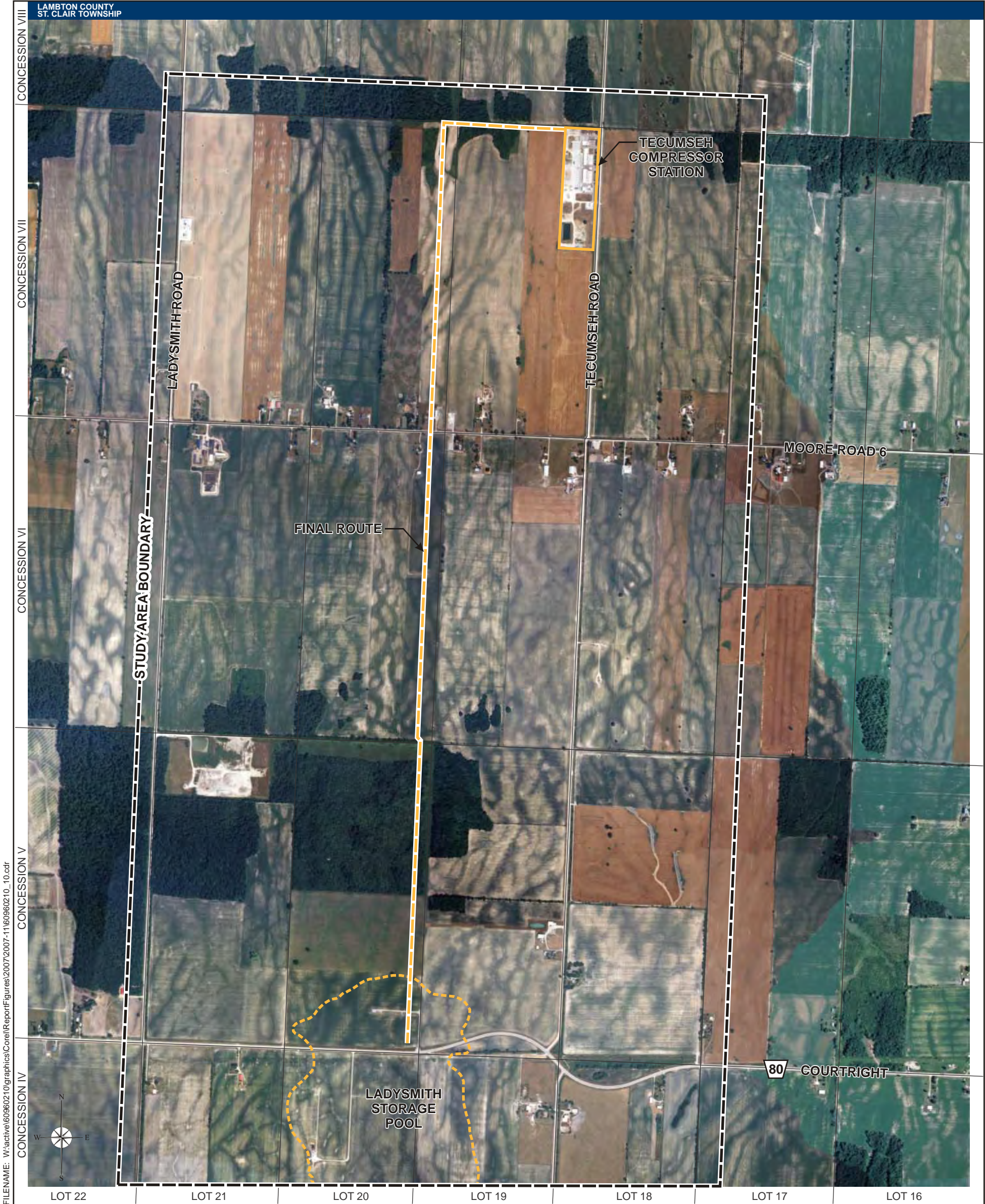
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| FIGURE NO. A1-3 | |

PREFERRED ROUTE

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Base Map Source: Monteith and Southerland, 2002, Original Scale 1:6,100.

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FINAL ROUTE



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Appendix B

Public Consultation

Appendix B1

Stakeholder Summary Communications

APPENDIX B1 - SUMMARY OF STAKEHOLDER COMMUNICATION

| Stakeholder | Type of Correspondence | Date | Issue or Concern | Type of Correspondence | Date | Response |
|--|------------------------|----------|--|------------------------|----------|--|
| Archaeological Research Associates Ltd. | Letter | 07/14/98 | <ul style="list-style-type: none"> No additional archaeological finds other than those noted in original 1993 EA will be impacted by project. Construction can proceed with same recommendation as original report outlined. | | | <ul style="list-style-type: none"> No response required |
| City of Sarnia ~ Planning and Building Department | Email | 06/26/06 | <ul style="list-style-type: none"> Project does not have any direct impact on City of Sarnia. | | | <ul style="list-style-type: none"> No response required |
| Ministry of Transportation (MTO) ~ Southwestern Region | Email | 06/26/06 | <ul style="list-style-type: none"> MTO has no concerns for this project. | | | <ul style="list-style-type: none"> No response required |
| Ministry of Municipal Affairs and Housing (MMAH) ~ Provincial Planning and Environmental Services Branch | Email | 06/27/06 | <ul style="list-style-type: none"> Forwarded Stantec's Notice of Commencement letter on to Bruce Curtis, Manager Southwestern Office. | | | <ul style="list-style-type: none"> No response required |
| Ministry of the Environment (MOE) ~ West Central Region` | Email | 06/27/06 | <ul style="list-style-type: none"> Informed Stantec that the information request should be forwarded to the MOE's Southwest Region and asked whether Stantec wanted them to forward it on. | Email | 06/27/06 | <ul style="list-style-type: none"> Asked to forward message on in Stantec's behalf. |
| Indian and Northern Affairs Canada (INAC) ~ Specific Claims Branch | Email | 06/29/06 | <ul style="list-style-type: none"> There are no specific claims filed under the Specific Claims Policy for the Province of Ontario in the Study Area Suggested contacting the Specific Claims Branch or the Litigation Management and Resolution Branch. | | | <ul style="list-style-type: none"> No response required |

APPENDIX B1 - SUMMARY OF STAKEHOLDER COMMUNICATION

| Stakeholder | Type of Correspondence | Date | Issue or Concern | Type of Correspondence | Date | Response |
|---|------------------------|----------|--|------------------------|----------|--|
| Technical Standards & Safety Authority (TSSA) | Email | 06/30/06 | <ul style="list-style-type: none"> Informed Stantec that the Ontario Regulation on Oil and Gas Pipeline Systems has been updated and requirements are found in O. Reg. 210/01, entitled Director's Order of Amendment to the Oil and Gas Pipeline System Code Adoption Document. | | | <ul style="list-style-type: none"> No response required |
| MOE ~ West Central Region | Letter | 07/04/06 | <ul style="list-style-type: none"> Informed Stantec that the information request should be forwarded to the MOE's Southwest Region and asked whether Stantec wanted them to forward it on. | | | <ul style="list-style-type: none"> No response required |
| Ministry of Natural Resources (MNR) | Email | 07/08/06 | <ul style="list-style-type: none"> Requested a PDF of a map showing the alignment of the proposed pipeline. Informed Stantec of the presence of several natural gas wells that will need consideration during the project. Informed Stantec that there are several woodlots in Study Area that could be significant. Suggested that the municipality should be contacted to determine significance of woodlots. | Email | 07/23/06 | <ul style="list-style-type: none"> Sent a PDF of an aerial photograph of Study Area. Was notified that Stantec had identified that the route will pass through three forested areas and one hedgerow. Informed MNR that a comprehensive study of the features was conducted in 1992 and is being updated as part of the 2006 study process. Informed MNR that municipality is being contacted. |
| MOE ~ Southwestern Region | Email | 07/11/06 | <ul style="list-style-type: none"> He had been forwarded Notice of Commencement from the MOE's West Central Region and requested that all further correspondence with regards to this project be sent to him | | | <ul style="list-style-type: none"> No response required |
| Ministry of the Attorney General | Fax | 07/25/06 | <ul style="list-style-type: none"> Is in the process of conferring with colleagues in the Ontario Secretariat for Aboriginal Affairs. | | | <ul style="list-style-type: none"> No response required |
| Ontario Federation of Agriculture | Email | 08/03/06 | <ul style="list-style-type: none"> Requested that address be changed for future correspondence | | | <ul style="list-style-type: none"> No response required |

APPENDIX B1 - SUMMARY OF STAKEHOLDER COMMUNICATION

| Stakeholder | Type of Correspondence | Date | Issue or Concern | Type of Correspondence | Date | Response |
|---|------------------------|----------|---|------------------------|----------|---|
| MNR ~ Chatham Office | Email | 10/25/07 | <ul style="list-style-type: none"> No specific impacts to fish and wildlife are anticipated as a result of the Project. | | | <ul style="list-style-type: none"> No response required |
| County of Lambton | Letter | 04/11/07 | <ul style="list-style-type: none"> Concerned about impact to local woodlot areas. Referred Stantec to St. Clair Township Official Plan and County Official Plan which states that woodlots should be avoided if at all possible. Should tree clearing be necessary, for every tree removed, two must be planted, ideally within the same general area that they were removed. | | | <ul style="list-style-type: none"> No response required |
| INAC ~ Litigation Management and Resolutions Branch | Phone Call | 04/12/07 | <ul style="list-style-type: none"> Stantec requested that a search be conducted for any First Nations Claims within the Study Area. Stantec sent email with Study Area map. | | | <ul style="list-style-type: none"> |
| INAC ~ Comprehensive Claims Branch | Phone Call | 04/12/07 | <ul style="list-style-type: none"> Stantec requested that a search be conducted for any First Nations Claims within the Study Area. | Phone Call | 04/12/07 | <ul style="list-style-type: none"> No claims were found within the area of Sarnia. |

Appendix B2

Agency Contact List and Notice of Commencement

TECUMSEH COMPRESSOR STATION TO LADYSMITH STORAGE POOL PIPELINE PROJECT – AGENCY CONTACT LIST

| Agency | Title | First Name | Last Name | Position | Phone | Fax | Address | City | Prov | Postal Code |
|--|-------|------------|--------------|---|--------------|--------------|---|------------|------|-------------|
| Environment Canada | Mr. | Rob | Dobos | Head - Assessment | 905-336-4953 | 905-336-8901 | 867 Lakeshore Road | Burlington | ON | L7R 4A6 |
| Hydro One Inc. | Mr. | Tony | Ierullo | Manager | 416-345-6408 | 416-345-5396 | 483 Bay St., 11th Floor, North Tower | Toronto | ON | M5G 2P5 |
| Ministry of Agriculture and Food - Southwestern Region | Mr. | Dwayne | Evans | Rural Planner, Agricultural Land Use | 519-873-4085 | 519-826-3259 | London Resource Centre | London | ON | N6E 1L3 |
| Ministry of Agriculture, Food, and Rural Affairs | Mr. | David | Cooper | Manager, Agriculture Land Use | 519-826-3117 | 519-826-3259 | 667 Exeter Road 3rd Floor 1 Stone Road | Guelph | ON | N1G 4Y2 |
| Ministry of Citizenship and Culture | Mr. | George | Potter | Manager, Southwest Area | 519-571-6050 | 519-578-1632 | 4th Floor, Suite 405, 30 Duke St. W. | Kitchener | ON | N2H 3W5 |
| Ministry of Municipal Affairs and Housing - Southwest Ontario Office | Mr. | Scott | Oliver | Planner (Chatham Area) | 800-265-4736 | 519-873-4018 | 659 Exeter Rd, 2nd Floor | London | ON | N6E 1L3 |
| Ontario Federation of Agriculture | Mr. | Peter | Jeffery | Member Service Specialist | 416-485-3333 | 416-485-9027 | OFA 100 Stone Rd. West Suite 206 | Guelph | ON | N1G 5L3 |
| Ministry of Transportation – Southwestern Region | Mr. | Kevin | Bentley | Manager, Engineering Office | 519-873-4373 | 519-873-4388 | 659 Exeter Road | London | ON | N6E 1L3 |
| Ministry of Natural Resources – Chatham Division | Mr. | Ken | Yaraskavitch | Area Supervisor | 519-354-7340 | 519-354-0313 | 870 Richmond Street W. PO Box 1168 | Chatham | ON | N7M 5L8 |
| Ministry of Natural Resources – Chatham District | Mr. | Fred | Johnson | Lambton County Fish and Wildlife Technical Specialist | 519-354-7340 | 519-354-0313 | 870 Richmond Street W. PO Box 1168 | Chatham | ON | N7M 5L8 |
| Ministry of Environment – Sarnia District Office | Mr. | Chris | Hutt | Senior Environmental Officer | 519-383-3784 | 519-336-4280 | 1094 London Rd | Sarnia | ON | N7S 1P1 |
| Ministry of Agriculture and Food – Southwestern Ontario | Mr. | John | Turvey | Land Use Policy Specialist | 519-826-3555 | 519-873-4062 | 1 Stone Rd. West | Guelph | ON | N1G 4Y2 |
| Ministry of Transportation – Corridor Control Office | Mr. | Shawn | McGuire | Regional Development Review Coordinator | 519-873-4597 | 519-873-4600 | 659 Exeter Rd. 4 th Floor | London | ON | N6E 1L3 |
| Ministry of Culture – Southwest Archaeological Field Office | Mr. | John | MacDonald | Heritage Planner / Archaeologist | 519-675-7742 | 519-675-7777 | 900 Highbury Ave. | London | ON | N5Y 1A4 |
| St. Clair Region Conservation Authority | Mr. | Ralph | Coe | General Manager | 519-245-3710 | 519-245-3348 | 205 Mill Pond Crescent | Strathroy | ON | N7G 3P9 |

**TECUMSEH COMPRESSOR STATION TO TECUMSEH COMPRESSOR STATION TO LADYSMITH STORAGE POOL PIPELINE PROJECT –
AGENCY CONTACT LIST**

| Agency | Title | First Name | Last Name | Position | Phone | Fax | Address | City | Prov | Postal Code |
|---|-------|-------------------------|-------------|---|--------------------|--------------|---|---------------|------|-------------|
| Lambton County - Planning and Development Services Department | Mr. | Bill | Bilton | Chair | 519-845-0801 | 519-845-3817 | 789 Broadway St., PO Box 3000 | Wyoming | ON | N0N 1T0 |
| City of Sarnia - Planning Department | Mr. | Michael | Shnare | Director, Planning and Building | 519- 332-0330 | | City Hall, 255 North Christina St., PO Box 3018 | Sarnia | ON | N7T 7N2 |
| Lambton County - Planning and Development Department | Mr. | Ezio | Nadalin | Planner | 519-845-0801 X343 | 519-845-3817 | 789 Broadway St., PO Box 3000 | Wyoming | ON | N0N 1T0 |
| Ministry of Municipal Affairs and Housing - Southwestern Municipal Services | Mr. | Bruce | Curtis | Manager of Community Planning and Development | 519-873-4026 | 519-873-4018 | 659 Exeter Rd. 2 nd Floor | London | ON | N6E 1L3 |
| St. Clair Twp | Mr. | John | Rodey | CAO | 519-867-2021 | 519-867-5509 | 1155 Emily St. | Mooretown | ON | N0N 1M0 |
| St. Clair Twp | Mr. | John | DeMars | Clerk | 519-867-2021 | 519-867-5509 | 1155 Emily St. | Mooretown | ON | N0N 1M0 |
| Ducks Unlimited – Ontario | Mr. | Dave | McLachlin | Senior Resource Specialist | 705-721-4444 X7231 | 705-721-4999 | 566 Welham Rd | Barrie | ON | L4N 8Z7 |
| Federation of Ontario Naturalists | Mr. | James | Faught | Executive Director | 416-444-8419 | 416-444-9866 | 355 Lesmill Rd | Toronto | ON | M3B 2W8 |
| Ontario Nature | | | | | | | | | | |
| Ontario Federation of Agriculture | Mr. | Peter | Jeffrey | Senior Researcher | 416-485-3333 | 416-485-9027 | 40 Eglinton Ave. E., 5 th Floor | Toronto | ON | M4P 3B1 |
| Ontario Federation of Agriculture - Middlesex-Lambton | Ms. | Rebecca | Lunn-de Wit | Member Service Representative | 519-264-1444 | 519-264-9091 | 633 Lions Park Drive, P.O. Box 639 | Mount Brydges | ON | N0L 1W0 |
| Lambton Federation of Agriculture | Mr. | Dennis | Bryson | President | 519-828-3311 | | RR 8 | Watford | ON | N0N 1A0 |
| Sarnia-Lambton | Ms. | Caroline | Di Cocco | MPP | 519-337-0051 | 519-337-3246 | First Sarnia Place 201 Front St. N., Suite 407 | Sarnia | ON | N7T 7T9 |
| Sarnia-Lambton | Mr. | Patricia | Davidson | MP | 519-383-6600 | 519-383-0609 | 1000 Finch Drive Unit #2 | Sarnia | ON | N7S 6G5 |
| Union of Ontario Indians | | Nippising First Nations | | | 705-497-9127 | 705-497-9135 | P.O Box 711 | North Bay | ON | P1B 8J8 |
| Ministry of the Attorney General – Crown Law Office - Civil | Mr. | Robert | Ratcliffe | Deputy Director | 416-326-4128 | 416-326-4181 | 8 th Floor, 720 Bay St. | Toronto | ON | M5G 2K1 |
| | | | | | | | | | | |

**TECUMSEH COMPRESSOR STATION TO TECUMSEH COMPRESSOR STATION TO LADYSMITH STORAGE POOL PIPELINE PROJECT –
AGENCY CONTACT LIST**

| Agency | Title | First Name | Last Name | Position | Phone | Fax | Address | City | Prov | Postal Code |
|--|-------|------------|-----------|-------------------------------------|--------------|--------------|---|----------------|------|-------------|
| Indian and Northern Affairs Canada – Ontario Research Team | | Maryanne | Pearce | Senior Claims Research Team | 819-953-1940 | 819-997-9873 | 10 Wellington St. | Gatineau | QC | K1A 0H4 |
| Indian and Northern Affairs Canada – Comprehensive Claims Branch | | Louise | Trepanier | Director of Claims East of Manitoba | 819-994-1211 | 819-953-3109 | 10 Wellington St. | Gatineau | QC | K1A 0H4 |
| Ontario Secretariat for Aboriginal Affairs – Policy and Relations | | Barry | Silver | Senior Policy Advisor | 416-326-2364 | 416-326-4017 | 4 th Floor, 720 Bay St. | Toronto | ON | M5G 2K1 |
| Ministry of Agriculture, Food, and Rural Affairs - Ontario Pipeline Coordinating Committee | Ms. | Donna | Mundie | | 519-826-3120 | 519-826-3259 | 1 Stone Road West | Guelph | ON | N1G 4Y2 |
| Technical Standards and Safety Authority - Ontario Pipeline Coordinating Committee | Mr. | Oscar | Alonso | Fuels Safety Engineer | 416-734-3353 | 416-326-8248 | 3300 Bloor Street West 14 th Floor | Etobicoke | ON | M8X 2X4 |
| Ministry of Culture - Ontario Pipeline Coordinating Committee | Mr. | Michael | Johnson | | 416-314-7144 | 416-314-7175 | 400 University Avenue 4 th Floor | Toronto | ON | M7A 2R9 |
| Ontario Energy Board - Ontario Pipeline Coordinating Committee | Ms. | Zora | Crnojacki | | 416-440-8104 | 416-440-7656 | 2601-2300 Yonge Street, 24 th Floor PO Box 2319 | Toronto | ON | M4P 1E4 |
| Ministry of Transportation - Ontario Pipeline Coordinating Committee | Mr. | Doug | Peeling | | 905-704-2916 | 905-704-2030 | 301 St. Paul Street 2 nd Floor | St. Catharines | ON | L2R 7R4 |
| Ministry of Environment – West Central - Ontario Pipeline Coordinating Committee | Mr. | Carl | Slater | Technical Support Manager, APEP | 905-521-7720 | | 119 King Street West 12 th Floor | Hamilton | ON | L8P 4Y7 |

4



T-52-510

Ontario
Energy
Board

Commission
de l'Énergie
de l'Ontario

P.O. Box 2319
2300 Yonge Street
26th Floor
Toronto, Ontario
M4P 1E4
(416) 481-1967
Fax (416) 440-7656

C.P.2319
2300, rue Yonge
26^e étage
Toronto (Ontario)
M4P 1E4
(416) 481-1967
Télécopieur (416) 440-7656

August 16, 1993

RECEIVED
AUG 25 1993
TECUMSEH GAS
STORAGE

Mr. Ray Schnegelsberg, P.Eng.
Manager, Engineering
Tecumseh Gas Storage
P.O. Box 520
Corunna, Ontario
N0N 1G0

Dear Mr. Schnegelsberg:

Re: Review of Environmental Report - Ladysmith Pool

The Ontario Pipeline Coordination Committee has completed its review of the environmental report for the Ladysmith Pool. No outstanding issues have been identified. I have enclosed a copy of all correspondence received from OPCC members.

Yours truly,



Neil McKay
Chair OPCC

Encl. MA - May 20, 1993
MTO - May 31, 1993
MCCR - June 4, 1993
MNR - June 8, 1993
OMAF - June 16, 1993
MOEE - August 6, 1993

Appendix B3

Agency Correspondence



Archaeological
Research
Associates Ltd.

2, Petersburg, Ontario N0B 2H0
[519] 744-7729
Fax [519] 884-8853
248 Ruby St., Midland, Ontario L4R 2L4
[705] 526-9518
Fax [705] 526-4541

July 14, 1998
Mr. Matthew MacCullough
ESP International
361 Southgate Dr.
Guelph, Ontario
N1G 3M5

Dear Sir:

Re our reports: Tescumseth Gas Storage, Lady Smith-1993 and
Coveny Pool and Transmission Pipe-1996

Further to my conversation with Geoff Carnagie of your office, Archaeological Research Associates Limited reviewed the archaeological site files of the Ontario Ministry of Citizenship, Culture and Recreation for the above properties. It would appear that there are no additional archaeological finds other than those noted in our original reports that could be impacted by the proposed construction. Therefore, construction may proceed with the same recommendations as noted in our original report.

Please contact our office if we can be of further assistance in this matter.

Yours truly,

Dean Knight Phd.

ARCHAEOLOGICAL RESEARCH ASSOCIATES LIMITED

Dean Knight, Ph.D.

Isobel Ball, B.A.

James Hunter, MMST

Bud Parker, M.A.

Adamson, Melanie

From: Wesenger, David
Sent: Monday, June 26, 2006 11:13 AM
To: Adamson, Melanie
Subject: FW: EA Ladysmith Natural Gas Storage to Enbridge Gas Tecumseh Compressor Station

-----Original Message-----

From: Mike Schnare [mailto:mschnare@sarnia.ca]
Sent: Monday, June 26, 2006 11:11 AM
To: Wesenger, David
Subject: EA Ladysmith Natural Gas Storage to Enbridge Gas Tecumseh Compressor Station

Dear Mr. Wesenger:

This project is located fully within the Township of St. Clair. The project does not have any direct impact on the City of Sarnia. If I am misunderstanding this project please advise me.

Michael Schnare
Director of Planning and Building

This e-mail transmission cannot be guaranteed to be secure or error-free and the sender does not accept liability for such errors or omissions. The e-mail and all attachments may contain confidential information that is intended solely for the addressee(s). If you received this communication in error, please reply to the sender or notify them by telephone at (519) 332-0330 and delete or destroy any copies.

Adamson, Melanie

From: Wesenger, David
Sent: Monday, June 26, 2006 1:46 PM
To: Adamson, Melanie
Subject: FW: EA - Enbridge Gas Distribution Inc. Ladysmith, Natural Gas Storage Pool to Enbridge Gas Tecumseh Compressor System

-----Original Message-----

From: Santos, Paul (MTO) [mailto:Paul.Santos@mto.gov.on.ca]
Sent: Monday, June 26, 2006 1:44 PM
To: Wesenger, David
Cc: Boudreau, Kevin (MTO); vandenBoorn, Richard (MTO); Hitchcock, Jack (MTO)
Subject: EA - Enbridge Gas Distribution Inc. Ladysmith, Natural Gas Storage Pool to Enbridge Gas Tecumseh Compressor System

We have received the notice regarding your participation in the EA Update for the project noted above.

We note from the attached map that the westerly boundary of the study area is situated approximately 1km east of Highway 40, and that the preferred route for the pipeline is situated approximately 2km east of Highway 40.

As such, the Ministry of Transportation has no concerns with respect to this project. Please continue to circulate us on any future change to the proposal that may impact the provincial highway system.

Regards,

Paul

Paul Santos
Regional Development Review Coordinator
Planning and Design Section
MTO Southwestern Region, London.
Tel.: (519) 873-4593, Fax.: (519) 873-4600

Adamson, Melanie

From: Wesenger, David
Sent: Tuesday, June 27, 2006 3:39 PM
To: Adamson, Melanie
Subject: FW: Environmental Assessment- Ladysmith Pipeline Project- Sarnia

-----Original Message-----

From: Ahmed, Usman (MAH) [mailto:Usman.Ahmed@mah.gov.on.ca]
Sent: Tuesday, June 27, 2006 3:19 PM
To: Wesenger, David
Cc: Barton, Howard (MAH); Curtis, Bruce (MAH)
Subject: Environmental Assessment- Ladysmith Pipeline Project- Sarnia

Dear Mr. Wesenger:

Thank you for your letter dated June 21, advising us of the preparation of an EA for the above noted project and inviting us to provide input. I have forwarded your correspondence to Mr. Bruce Curtis, Manager, Southwestern Office, for his attention. His office will be in touch with you directly regarding our involvement into this study. Mr. Curtis can be reached at (519) 873-4026.

Thank you again for inviting us to participate in this study.

Usman Ahmed

Provincial Planning and Environmental Services Branch
Ministry of Municipal Affairs and Housing
Tel: (416) 585-7181
Fax: (416) 585-4006/4245
Email: usman.ahmed@mah.gov.on.ca

Adamson, Melanie

From: Wesenger, David
Sent: Tuesday, June 27, 2006 10:49 AM
To: 'Jensen, Phil (ENE)'
Cc: Adamson, Melanie
Subject: RE: File 160960210 Ladysmith to Enbridge Compressor Stn

Phil,

Thanks for bringing this to my attention. If it is a simple matter for you please forward the document to the appropriate contact in Southwest Region and provide me with the contact so I can ensure that our contact list is amended.

Dave

-----Original Message-----

From: Jensen, Phil (ENE) [mailto:Phil.Jensen@ene.gov.on.ca]
Sent: Tuesday, June 27, 2006 10:41 AM
To: Wesenger, David
Subject: File 160960210 Ladysmith to Enbridge Compressor Stn

Hi David. Your letter of June 21, 2006 regarding this file was forwarded to Carl Slater, who is away this week. It appears to us, however, that the project is located in Southwest Region (not West Central) and should be going to a contact in our London Office. Would that be your understanding and, if so, do you want us to forward? Do you have a contact in SW?

P

Phil Jensen
Supervisor (A)
APEP, West Central Region
Ministry of the Environment
119 King St. W., 12th Floor
Hamilton, ON L8P 4Y7
(905) 521-7716 Fax (905) 521-7820
phil.jensen@ene.gov.on.ca

Adamson, Melanie

From: Wesenger, David
Sent: Thursday, June 29, 2006 10:13 AM
To: Adamson, Melanie
Subject: FW: Environmental Assessment - Enbridge Gas Distribution Inc - St.Clair Township, Ontario

-----Original Message-----

From: Steven Begg [mailto:beggs@ainc-inac.gc.ca]
Sent: Thursday, June 29, 2006 10:11 AM
To: Wesenger, David
Cc: Barbara MacComb; Maryanne Pearce
Subject: Environmental Assessment - Enbridge Gas Distribution Inc - St.Clair Township, Ontario

Dear Mr. Wesenger,

This email is in response to your request for information dated June 21, 2006, regarding whether the Specific Claims Branch had any input to provide regarding the environmental assessment for the natural gas line that will connect the Enbridge Gas Tecumseh Compressor Station to the Ladysmith Natural Gas Storage Pool, in St. Clair Township, Ontario.

We have conducted a search of our records and determined that no specific claims have been submitted in the area of interest. Although no specific claims affecting the indicated municipalities have been filed to date, we cannot make any representations regarding potential or future claims.

Please rest assured that it is the policy of the Government of Canada as expressed in *Outstanding Business: A Native Claims Policy* that "In any settlement of specific native claims the government will take third party interests into account. As a general rule, the government will not accept any settlement which will lead to third parties being dispossessed".

We can only speak directly to claims filed under the Specific Claims Policy for the Province of Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Comprehensive Claims Policy or legal action by First Nations against the Crown. You will have to contact the Comprehensive Claims Branch at (819) 994-7521 or the Litigation Management and Resolution Branch at (819) 934-2185 directly for more information.

Specific Claims has developed a "Public Information Status Report" on all claims which have been submitted to date. This information is available to the public on the Indian and Northern Affairs Canada website and can be found at http://www.ainc-inac.gc.ca/ps/clm/pis_e.html

I hope this information will assist you in any further queries. As there are no claims in the affected area, **it is not necessary to keep this office informed of the project's progress.** I trust that this satisfactorily addresses your concerns. If you wish to discuss this matter further please contact Maryanne Pearce, Senior Claims Analyst for Ontario, at (819) 953-1940.

Sincerely,
 Steven Begg

Steven Begg
Research Assistant | Adjoint de recherche
SCB Ontario Research Team | DGRP Équipe de recherche d'Ontario
Indian and Northern Affairs Canada | Affaires Indiennes et du Nord Canada
10 Rue Wellington, Gatineau, PQ, K1A 0H4
(819)956-4231, fax: (819) 997-9873
beggs@ainc-inac.gc.ca

Adamson, Melanie

From: Wesenger, David
Sent: Friday, June 30, 2006 4:49 PM
To: Adamson, Melanie
Subject: FW: Environmental Assessment - Enbridge Gas Distribution Inc. - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station.

-----Original Message-----

From: oalonso@tssa.org [mailto:oonso@tssa.org]
Sent: Fri 6/30/2006 4:44 PM
To: Wesenger, David
Cc:
Subject: Fw: Environmental Assessment - Enbridge Gas Distribution Inc. - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station.

----- Forwarded by Oscar Alonso/TSSA on 30/06/2006 04:45 PM -----

Oscar Alonso/TSSA
30/06/2006 04:17 PM

To
dwessenger@stantec.com
cc

Subject
Environmental Assessment - Enbridge Gas Distribution Inc. - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station.

Mr. David P. Wessenger
Senior Project Manager
Stantec Consulting Ltd.,
361 Southgate Drive,
Guelph, ON N1G 3M5

This is in response to your letter of June 21, 2006, about the proposed construction of the referenced NPS 24 pipeline.

The Ontario Regulation on Oil and Gas Pipeline Systems has been updated and now the applicable requirements are contained in document issued under the O. Reg. 210/01, entitled Director's Order of Amendment to the Oil and Gas Pipeline System Code Adoption Document.

Should you have any questions, please call me.

Yours truly,

Oscar Alonso
Fuels Safety Engineer
Tel.: 416 734 3353
e-mail: oalonso@tssa.org

Technical Standards & Safety Authority -- "Putting Public Safety First"
website: www.tssa.org
toll-free: 1-877-682-8772

Ministry of the Environment

119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement

119 rue King ouest
12^e étage
Hamilton (Ontario) L8P 4Y7
Tél. : 905 521-7640
Télec. : 905 521-7820



July 4, 2006

David Wesenger
Senior Project Manager
Stantec Consulting Ltd.
361 Southgate Drive
Guelph, Ontario
N1G 3M5

Dear Mr. Wesenger:

This is to respond to your letter dated June 21, 2006 regarding a proposed natural gas pipeline that will connect the Ladysmith Natural Gas Storage Pool to the Enbridge Gas Compressor Station in St. Clair Township, Lambton County.

It appears from the maps provided that the extent of the proposed undertaking lies completely within Lambton County. It is the South West Region of the Operations Division which has mandate for that geographical area. I presume that that office in London, Ontario has been circulated for comments. Accordingly, no further review or action is planned from this office.

If you require additional information or clarification, please contact me at (905)521-7716.

Yours truly,

A handwritten signature in black ink, appearing to be "Phil Jensen", with a long horizontal stroke extending to the right.

Phil Jensen
Supervisor (A), Air, Pesticides and Environmental Planning
West Central Region

Adamson, Melanie

From: Wesenger, David
Sent: Monday, August 14, 2006 10:03 AM
To: Adamson, Melanie
Cc: Kozak, Mark
Subject: FW: EA - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station

From: Noordhof, Jake (MNR) [mailto:jake.noordhof@mnr.gov.on.ca]
Sent: Tuesday, August 08, 2006 10:58 AM
To: Wesenger, David
Cc: Noordhof, Jake (MNR)
Subject: RE: EA - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station

Dear Mr. Wesenger,

The Ministry of Natural Resources would like to thank you for your notice regarding the Environmental Assessment for Ladysmith Natural Gas Storage Pool to Enbridge Gas Tecumseh Compressor Station. We would ask that you send an electronic copy (i.e. PDF) of the map showing the proposed location of the natural gas pipeline so that we can circulate to our Petroleum section. There are a number of natural gas wells in the study area that will need to be given consideration through your proposed development. Furthermore, we have determined there to be a number of large woodlots that could potentially be impacted by the proposed pipeline. Have the potential impacts of the proposed pipeline on these features been looked at in any detail? The municipality is responsible for determining significance of woodlands and so it is recommended that they consulted through this EA process.

Any information you could provide in regards to the comments above would be appreciated.

Thanks,

Jake

Jake Noordhof
Acting District Planner
Aylmer District Office
Ministry of Natural Resources
Phone: 519-773-4750
Email: jake.noordhof@mnr.gov.on.ca

Adamson, Melanie

Subject: FW: Ladysmith Pool to Enbridge Compressor (Your FILE 160960210)

From: Aggerholm, Bob (ENE) [mailto:Bob.Aggerholm@ene.gov.on.ca]
Sent: Tue 7/11/2006 1:46 PM
To: Wesenger, David
Subject: Ladysmith Pool to Enbridge Compressor (Your FILE 160960210)

Dear Mr. Wesenger:

Your June 21, 2006 correspondence regarding the above was referred to the Ministry's London Office (St. Clair Township is the Southwestern Region administrative district of MOE)

Please forward all correspondence relating to this OEB EA project to me at the London Office.

Bob Aggerholm
Environmental Planner
Ministry of Environment
Southwestern Region
733 Exeter Road
London, Ontario N6E 1L3
Voice Direct: (519) 873-5012
Office Switchboard: (519) 873-5000
Office Fax: (519) 873-5020
E-mail Direct: bob.aggerholm@ene.gov.on.ca

Adamson, Melanie

From: John.Macdonald@mcl.gov.on.ca
Sent: Monday, July 24, 2006 3:23 PM
To: Adamson, Melanie
Subject: RE: Archaeological Assessment Update

Hi Melanie,

If the current proposed pipeline route is the same as that of the 1993 project, then we have no further concerns for this project. The two registered sites of archaeological significance, and that were identified in 1992, are not located within the proposed pipeline route. If the current proposed pipeline route is different from the archaeologically assessed route, then a Stage 2 field assessment would be required.

I trust that this is of assistance.

John MacDonald
Ministry of Culture

From: Adamson, Melanie [mailto:madamson@stantec.com]
Sent: July 24, 2006 1:37 PM
To: John.Macdonald@mcl.gov.on.ca
Subject: RE: Archaeological Assessment Update

Hello John,

I have attached the letter sent to us from ARAL in 1998 to confirm that there were no more archaeological sites found in the study area other than what was discovered in the Stage II assessment conducted in 1992. This was the only additional information in the 1998 *Environmental and Socio-Economic Impact Assessment* report that was not included in the Stage I and Stage II assessments found in our 1993 report.

If you require more information on this topic, please let me know.

Thank you,
Melanie.

From: John.Macdonald@mcl.gov.on.ca [mailto:John.Macdonald@mcl.gov.on.ca]
Sent: Monday, July 24, 2006 11:46 AM
To: Adamson, Melanie
Subject: RE: Archaeological Assessment Update

Hi Melanie,

I was able to find a report by Archaeological Research Associates dated 1992 for the Ladysmith project. I have not been able to find the 1998 the *Environmental and Socio-Economic Impact Assessment* report. Could you forward the section of this report that pertains to the archaeology?

Thanks,
John MacDonald
Ministry of Culture

From: Adamson, Melanie [mailto:madamson@stantec.com]

Sent: July 21, 2006 4:30 PM

To: john.macdonald@mcl.gov.on.ca

Subject: Archaeological Assessment Update

Hello John,

We spoke on the phone on Friday, July 21 about performing an update on a Stage 1 and 2 Archaeological Assessment that was done back in 1993 by Archaeological Research Associates Ltd. The original project was never completed, however an alternate project was completed in 1998, in the same study area, and there was an update to the 1993 report finished at that time. Stantec Consulting is currently updating the information collected for the 1993 and 1998 reports for the original project proposed in 1993.

The name of the original report from 1993 completed by ESG International (now Stantec Consulting Ltd.) is *Ladysmith Pool NPS 14 Pipeline Route Selection/Environmental Assessment and Storage Pool Environmental Management Plan*. The name of the update report from 1998 is *Environmental and Socio-Economic Impact Assessment: Ladysmith Connection Project*.

The study area is in St. Clair Township (formerly Moore Township) between concessions 4 and 8, and lots 17 and 21. The client for the project is Enbridge Gas Distribution Inc. (formerly Tecumseh Gas Storage). The current project is for the construction of an NPS 24 pipeline from the Tecumseh Compressor Station to the Ladysmith Natural Gas Storage Pool. We sent you an initial agency contact letter dated June 21, 2006 that gave a brief description of the project, which included a small map of the area.

Please let me know if you require any more information about this project in order to determine if any additional archaeological work is required in the study area.

Thank you,

Melanie Adamson, B.Sc. (Env.)

Environmental Scientist

Stantec

Ph: (519) 836-6050

Fx: (519) 836-2493

madamson@stantec.com

www.stantec.com

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**Ministry of the
Attorney General**

Crown Law Office
Civil Law

720 Bay Street
8th Floor
Toronto ON M5G 2K1

Tel/Tél: (416) 326-4112
Fax/Téléc.: (416) 326-4181

**Ministère du
Procureur général**

Bureau des avocats
de la Couronne Droit civil

720 rue Bay
8^e étage
Toronto ON M5G 2K1

Please refer to File
S.V.P. Se référer au dossier
No. 31894



Delivered VIA FACSIMILE

July 25, 2006

David P. Wesenger
Senior Project Manager
Stantec Consulting Ltd.
361 Southgate Drive
Guelph, Ontario
N1G 3M5

Dear Mr. Wesenger:

**Re: Environmental Assessment – Enbridge Gas Distribution Inc. – Ladysmith
Natural Gas Storage pool to Enbridge Gas Tecumseh Compressor Station**

This matter has been referred to me and I am in the process of conferring with my colleagues in the Ontario Secretariat for Aboriginal Affairs (OSSA) on the matters you have raised in your correspondence. Due to vacation schedules I will not be able to get back to you until the early weeks in August.

Yours very truly,

PLI: Grant Wedge
Counsel – Aboriginal Legal Issues Office

GW/mm

Adamson, Melanie

From: Wesenger, David
Sent: Thursday, August 03, 2006 2:42 PM
To: Adamson, Melanie; Candido, Mike
Subject: FW: address change

From: Peter Jeffery [mailto:peter.jeffery@ofa.on.ca]
Sent: Thursday, August 03, 2006 2:37 PM
To: Wesenger, David
Subject: address change

David;

Please note that the Ontario Federation of Agriculture has moved. Our new office address is;

Ontario Federation of Agriculture
Ontario Agri-Centre
100 Stone Rd. West, Suite 206
Guelph, ON, N1G 5L3

PH: 519-821-8883
FX: 519-821-8810

Peter Jeffery
Sr. Policy Researcher
Ontario Federation of Agriculture

email: peter.jeffery@ofa.on.ca

Adamson, Melanie

From: Adamson, Melanie
Sent: Wednesday, August 23, 2006 12:55 PM
To: 'jake.noordhof@mnr.gov.on.ca'
Subject: EA - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station
Attachments: 60960210_01.pdf

Hello Jake,

Thank you for your comments regarding the Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station Project. I have attached an aerial photograph of the study area showing the preferred route. As seen on the map the preferred route passes through 3 forested areas and one hedgerow. A comprehensive study of these features was completed in 1992, and is currently being updated. Thank you for the suggestion of contacting the municipality regarding this matter, consultation with the municipality is ongoing as part of the 2006 EA process.

Thank you,
 Melanie

From: Wesenger, David
Sent: Monday, August 14, 2006 10:03 AM
To: Adamson, Melanie
Cc: Kozak, Mark
Subject: FW: EA - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station

From: Noordhof, Jake (MNR) [mailto:jake.noordhof@mnr.gov.on.ca]
Sent: Tuesday, August 08, 2006 10:58 AM
To: Wesenger, David
Cc: Noordhof, Jake (MNR)
Subject: RE: EA - Ladysmith Natural Gas Storage Pool to Enbridge Gas Compressor Station

Dear Mr. Wesenger,

The Ministry of Natural Resources would like to thank you for your notice regarding the Environmental Assessment for Ladysmith Natural Gas Storage Pool to Enbridge Gas Tecumseh Compressor Station. We would ask that you send an electronic copy (i.e. PDF) of the map showing the proposed location of the natural gas pipeline so that we can circulate to our Petroleum section. There are a number of natural gas wells in the study area that will need to be given consideration through your proposed development. Furthermore, we have determined there to be a number of large woodlots that could potentially be impacted by the proposed pipeline. Have the potential impacts of the proposed pipeline on these features been looked at in any detail? The municipality is responsible for determining significance of woodlands and so it is recommended that they consulted through this EA process.

Any information you could provide in regards to the comments above would be appreciated.

Thanks,

Jake

Jake Noordhof

Acting District Planner

Aylmer District Office

Ministry of Natural Resources

Phone: 519-773-4750

Email: jake.noordhof@mnr.gov.on.ca

Adamson, Melanie

From: Wesenger, David
Sent: Thursday, October 26, 2006 11:37 AM
To: Adamson, Melanie
Subject: FW: Enbridge Gas - Ladysmith to Tecumseh

From: Simpson, Holly (MNR) [mailto:holly.simpson@mnr.gov.on.ca]
Sent: Wednesday, October 25, 2006 4:46 PM
To: Wesenger, David
Subject: Enbridge Gas - Ladysmith to Tecumseh

Hello David –

Please add me to your distribution on this project. I have reviewed your notice for the update of the EA for this proposed pipeline construction to connect the Ladysmith Natural Gas Storage Pool to Enbridge Gas Tecumseh Compressor Station. At this time I can see no specific impacts to fish or wildlife as a result of the proposed pipeline, but I please keep me notified on this project as it proceeds.

Thanks,

Holly Simpson

Area Biologist
Chatham MNR
p.(519) 354-8210
f. (519) 354-0313
holly.simpson@ontario.ca

April 11, 2007

Santec Consulting Ltd.
361 Southgate Drive,
Guelph, ON, N1G-3M5

Attn: Melanie Adamson

Re: Enbridge Gas Distribution Inc. – Tecumseh compressor Station to Ladysmith
Natural Gas Storage Pool

Further to our conversation on Tuesday, April 10, 2007 I would like to offer the following comments.

Our concerns are generally with the impact of the proposal on local woodlot areas. The County Official Plan (ie. Section 7.7 “Utility Corridors”) and local municipal St. Clair Township Official Plan direct utility corridors away from significant natural areas.

The St. Clair Township O.P. specifically states that *“public services and facilities... will be prohibited in significant natural areas (ie. Significant Woodlands) unless they are authorized under an environmental assessment process, or subject to the Drainage Act.”*

The general rule of thumb when looking at these type of proposals is to limit any new damage to established woodlots as much as possible and to consider other alternate routes when at all possible.

While it is our wish that no woodlots be affected by this project we do recognize that there may be occasions when woodlots may have to be broached. In the event of such a need we would draw your attention to subsection 7.7 3 of the County Official Plan and Section 16.2.6 and Section 16.2.7 of the local St. Clair Township Official Plan which state that *“where woodlot locations cannot be avoided, tree cover removed will be replaced with twice the area of tree cover that is removed”*, further to this we would require that these trees be planted within the Municipality that the removal occurred, and, if possible, within the same area that the removal took place.

Thank you for the opportunity to comment, and look forward to receiving further information on the progress of this project. If you have any questions regarding or comments or the Official Plan policies please feel free to call.

Best Regards,

Ezio Nadalin,
Planner

CONTACT RECORD

**Stantec**NAME(S): Lyn BernardPROJECT NO.: 160960210TELEPHONE: 819-994-7521REPRESENTING: INAC Comprehensive ClaimsDATE/TIME: April 12, 2007 11am BrandRE: First Nations ClaimsRECORDED BY: M. Adamson☐ CALL RECEIVED☒ CALL PLACED☐ MEETING

Left message
NOTES: - Inquiring about any claims filed w/i their branch of INAC for area south east of Sarnia

- Responded on April 12, 2007 that there are no claims w/i area southeast of Sarnia

| NO. | FOLLOW-UP TASK | TIMING | BY | DONE |
|-----|----------------|--------|----|------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Adamson, Melanie

From: Jonathan Allen [AllenJO@ainc-inac.gc.ca]
Sent: Monday, April 30, 2007 4:26 PM
To: Adamson, Melanie
Cc: Leah Lloyd; Shelley Messerschmidt
Subject: Re: Information Request

Ms. Adamson,

I am writing in response to your emails of April 12, 2007, and April 30, 2007 addressed to Shelley Messerschmidt inquiring about any claims that may affect the subject property.

We can advise that our inventory includes active litigation cases in the vicinity of this property. They are entitled:

Walpole Island First Nation, Bkejwanong Territory v. Attorney General of Canada, Her Majesty the Queen in Right of Ontario, court file #00-CV-189329, Ontario Superior Court of Justice;

Chippewas of Sarnia, Chippewas of Kettle Point, Chief Ray Rogers, James Oliver, Joanne Rogers, Phil Maness, Errnol Gray, Thomas Maness, Leslie Henry, Thelma Simon, Chief and Councillors of Chippewas of Sarnia, Chief Charles K. Shawkence, Earl D. Bressette, Robert George Jr., Melva George, Thomas M. Bressette, Donald Keith Bressette, Robert A. Bressette, Angeline Ruther Shawkence, Brian Monague, Chief and Councillors of the Chippewas of Kettle Point on behalf of themselves and the Chippewa Nation or Tribe of Indians at Sarnia and Kettle Point and all members of the Chippewa Nation or Tribe at Sarnia and Kettle Point, court file # 1796/87, Ontario Court of Justice;

Angeline Shawkence on behalf of herself and the other heirs of the Estate of Edgar Shawnoo Sr. (deceased) and on behalf of all persons, estates or heirs who have or have had beneficial interests in the lands comprising, from time to time, the Stoney Point Indian Reserve v. Her Majesty the Queen, court file #T-702-85, Federal Court of Canada;

Corporation of Township of Bosanquet v. Attorney General of Canada, Chippewas of Kettle and Stoney Point, court file #24085, Ontario Court of Justice; Chippewas of Kettle and Stoney Point First Nation v. Her Majesty the Queen, court file #T-863-95, Federal Court of Canada;

Rosalie Winnifred Manning, Bruce Manning, Joanne Jackson, C. Jane Manning, Tom Manning, Murray Manning, Harvey Manning, Steven Manning, Reta Pearl George, Maynard Travis George, R. Janet Cloud, Christina Melva George, Marcia Flora Simon, Marlin D. Simon, Kevin C.D. Simon, Nellie Rogers, Carl Bressette, Geneva George v. Her Majesty the Queen, Chippewas of Kettle and Stoney Point, Tom Bressette, Allan B. Bressette, Robert A. Bressette, Yvonne Bressette, Milton George, Gerald C. George, Bernard George, Norman F. Shawnoo, Brian Monague, court file # T-3077-94, Federal Court of Canada;

Chippewas of Kettle and Stoney Point v. Her Majesty the Queen in Right of Canada as represented by Attorney General of Canada and Minister for Department of Indian Affairs and Northern Development, Corporation of Township of Bosonquet, Paul Hendrick Wilmlink, Joanne Cecilia Wilmlink, Joyce Van Geel, Martha Jean Morrison, Paul L. Winger, Agnes J. Winger, Leon Edward, St. John, Margaret J. St. John, Daniel Albert Vincent Ruscirolelli, Rachel Emma Ruscirolelli, Domenico Abrogio, Maurina Ambrogio, William Walter Ellison, Gail Ann Ellison, National Trust Company, Joseph John Huybers, Joanne Maria Huybers, Karl Huetter, Inge Huetter, Annie Jeanette Dunston, Grace Marie Lasenby, Jack Harold Lasenby, Amin Mussani (in Trust), Donald Bruce Gray, Juliaan Alfons D'Hanyns, Simonne Clara D'Hanyns, Brian Bernard McGowan, Margaret Ann McGowan, Mary Lou LaPratte, Christopher Thomas Allan King, William John Harkness, Frances Curry Harkness, Barbara L. St. Louis, Eugene M. Sorin, Bank of Montreal, Frank Thoren, Cynthia Marie Thoren, The Toronto-Dominion Bank, Daniel Leo Bosnak, Ellen J. Bosnak, Edward G. Paschalidis, Veronika E. Paschalidis, Jack Malcolm Galbraith, Margaret Irene Galbraith, John Archibald Pedden, Dorothy Harriet Pedden, Gloria Ann Redmond, Carolyn Jane Sheprak, Diana Mary Susan Sheprak, Lotte Nachtnebel, Josef Szela, Erika Szela, Roy Francis Giroux, Madonna Giroux, Derek Leslie Barker, Nan Francis Barker, George C. Wallis, Janet Wallis,

Bernardus Josephus Veel, Hendrika Petronella Veel, St.
Willibrord Community Credit Union Limited, David A. Voll, Diane M. Voll, CIBC Mortgage Corporation, Pierre Conrad Morisset, 876709 Ontario Ltd., court file #13182/92, Ontario Superior Court of Justice.

I am unable to comment with respect to the possible effect of these claims as the cases have not yet been adjudicated and any statement regarding the outcome of the litigation would be speculative at this point. It is recommended that you consult legal counsel as to the effect these actions could have on the lands you are concerned with.

If you are interested in further details about the claims, copies of the pleadings can be obtained from the Courts for a fee; please contact the appropriate Court Registry Office and make reference to the court file numbers listed above.

We cannot make any comments regarding potential future claims, or claims filed under other departmental policies. I note that you have already contacted Specific Claims for information. For information on any current comprehensive claims you should also contact Guy Morin of the Comprehensive Claims Branch at (819) 956-0325.

If you have any further questions please do not hesitate to contact me at (819)956-3181.

Sincerely,

Jonathan Allen
A/Litigation Team Leader
Atlantic / Ontario Litigation
Litigation Management and Resolution Branch Indian and Northern Affairs Canada
p: 819-956-3181
f: 819-953-6143

>>> "Adamson, Melanie" <melanie.adamson@stantec.com> 04/12/07 11:15 AM
>>>
Hello,

I have received information from INAC's Specific Claims Branch indicating there are no specific claims filed under the Specific Claims Policy for the Province of Ontario. However, they informed me that I should contact INAC's Litigation Management and Resolutions Branch or INAC's Comprehensive Claims Branch for further information relating to First Nations Claims within this Study Area.

Please find attached a map showing the location of the Study Area within St.Clair Township, County of Lambton, Ontario.

I response by April 27th, 2007 would be greatly appreciated.

Thank you,
Melanie.

<<60960210_06_Mailout.pdf>>

Melanie Adamson, B.Sc.
Environmental Scientist
Stantec
361 Southgate Drive
Guelph ON N1G 3M5
Ph: (519) 836-6050
Fx: (519) 836-2493
melanie.adamson@stantec.com
stantec.com

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Ministry of the
Environment

Ministère de
l'Environnement

733 Exeter Road
London, ON N6E 1L3
Tel.: (519) 873-5000
1-800-265-7672
Fax: (519) 873-5020

733, chemin Exeter
London, ON N6E 1L3
Tél. : (519) 873-5000
1-800-265-7672
Télééc. : (519) 873-5020



May 2nd, 2007

Stantec Consulting Ltd.
361 Southgate Drive
Guelph, Ontario
N1G 3M5

Attention: Ms. Melanie Adamson, Environmental Scientist

Re: Cumulative Effects Assessment For The Tecumseh Compressor Station To
Ladysmith Natural Gas Storage Project, St. Clair Township, Lambton County

Dear Ms. Adamson:

I am providing you this letter today in response to your April 20th, 2007 e-mail addressed to this ministry wherein you advised that Stantec Consulting Ltd. are currently performing a Cumulative Effects Assessment for the Tecumseh Compressor Station to the Ladysmith Natural Gas Storage Pool Project, in St. Clair Township. Of particular interest to Stantec Consulting Ltd. is whether this ministry's Southwest Region is aware of any projects that will be taking place in the Study Area during the summer of 2008, when construction of the pipeline is reportedly scheduled to commence.

In response to your query, please be advised that this Ministry's Southwestern Region does not maintain a listing of the multitude of construction projects being carried out in this Region. It is up to you, as the proponent's consultant, to ensure that you exercise due diligence in this regard.

That said, the study area identified in your e-mail of April 20th, 2007 for this proposed project is located near the proposed Shell Refinery Study Area. As such, the MOE Southwest Region recommends that you liaise directly with Shell Canada Products at 1-866-450-7221 and their consultant Jacques Whitford Limited to determine whether or not the two Study Areas overlap and if they do, what impact, if any, one project might have on the other. The Ontario Energy Board itself could conceivably advise you of any other proposed projects within your study area. Also, the Township of St. Clair itself (519) 867-2021 may be cognizant of other projects and/or other Environmental Assessments proposed near or within the study area scheduled during the summer of 2008. As such, you may want to consider approaching the municipality with this same question, if you have not done so already.

In addition to the foregoing, the MOE Southwestern Region offers the following additional comments for your due consideration.

If the installation of the pipeline will result in de-watering (i.e. removing impounded water or groundwater) from the construction area, the proponent should be aware that this activity can create hydrology concerns. As a result of exposure to various soils and construction materials, such impounded water may have high concentrations of suspended sediment or may be contaminated with high nutrient content and/or toxic substances. If toxic substances are involved, contingency plans should be in place which outlines the proposed method of handling the material based on the contaminant identity and concentration. Protective measures should be taken to prevent such water from affecting the water quality of adjacent watercourses.

Also, as a reminder, in accordance with section 34(3)(c) of the Ontario Water Resources Act (OWRA), if the water removed during a dewatering operation is greater than 50,000 litres/day from any water source, a permit to take water (PTTW) must be obtained from the MOE Regional Office (please refer to attached Appendix "A" and Appendix "B" for PTTW and other legislative considerations).

This ministry would also like to draw your attention to the issue of water course crossings. This ministry's interest with these undertakings includes sediment/erosion control and minimization of bank disturbance as they relate to water quality issues. In addition, the management of excavation wastes is also of significance. For further information on water crossing considerations please refer to attached Appendix "D" in association with Appendices "A" and "B".

The Ministry of Environment has published a listing of closed and active waste sites. It is entitled "Waste Disposal Site Inventory" and is dated June 1991. MOE's interests regarding the development on or in the periphery of these waste sites is based on Section 46 of the Environmental Protection Act and MOE Guideline D-4. MOE Guideline D-4 (Publication No. 2158) is available on the MOE internet site at <http://www.ene.gov.on.ca> under "Publications" and "Forms, Manuals and Guidelines" tabs. Any project located on or in the periphery of any closed or active waste sites should take into due consideration MOE Guideline D-4, and Section 46 of the Environmental Protection Act..

Section 46 of the *Environmental Protection Act* states:

"46. No use shall be made of land or land covered by water which has been used for the disposal of waste within a period of twenty-five years from the year in which such land ceased to be so used unless the approval of the Minister for the proposed use has been given."

It is important to note that the 1991 Waste Disposal Site Inventory Report has not been updated since its publication. Consequently, Stantec Consulting Ltd. may want to consider confirming the information contained in the report in the field through on-site investigations. Historical waste sites may vary in size, waste composition and

environmental impact. The Inventory Report describes sites known to this Ministry in 1991; there could conceivably be other waste sites within the study area, not listed therein. The local municipality(s) may be aware of other active or closed waste disposal sites not listed therein, or you as the proponent might also be aware of additional waste disposal sites as a consequence of site reconnaissance(s) and/or negotiations with private landowners arising from this proposed project.

MOE recommends that Stantec Consulting Ltd. review the June 1991 Waste Disposal Site Inventory listings, in the context of the information provided in MOE Guideline D-4, and Section 46 of the Environmental Protection Act, and make a determination as to what impact, if any, the existence of these closed and active waste disposal sites, and should any other active or closed waste disposal sites exist, but are not listed in the June 1991 Waste Disposal Site Inventory, may have on this proposed project. Appendix C is a photocopy excerpt of the Active and Closed Waste Disposal Sites listed in MOE's June 1991 Waste Disposal Site Inventory for Lambton County. A complete copy of the Ministry's June 1991 Waste Disposal Site Inventory can be obtained from this Ministry's Public Information Centre and can be reached by dialing 1-800-565-4923 or (416) 325-4000.

Finally, this ministry recommends that the proponent approach the First Nations to advise them of the proposed details of the project and to share with them details of all actions to prevent impact to the watershed that may be associated with construction activities.

Please find immediately below, five agencies and contact names that should be approached to determine potentially affected Aboriginal communities in the project study area:

1. **The Ontario Secretariat for Aboriginal Affairs**
(Contact: Ms. Pam Wheaton, Director, Policy and Relationships Branch, Ontario Secretariat of Aboriginal Affairs, 720 Bay St., 4th Floor, Toronto ON M5G 2K1; fax: 416-326-4017; pam.wheaton@ontario.ca)
2. **Indian and Northern Affairs of Canada – Specific Claims Branch**
(Contact: Mr. Don Boswell, Senior Claims Analyst, Specific Claims Branch, Department of Indian and Northern Affairs, 10 Wellington St., Room 1310, Gatineau QC K1A 0H4; fax: 819-956-2258; boswelld@inac.gc.ca);
3. **Indian and Northern Affairs of Canada – Litigation Management and Resolution Branch**
(Contact: Mr. Franklin Roy, Director, Litigation Management and Resolution Branch, Department of Indian and Northern Affairs, 10 Wellington Street, Gatineau QC K1A 0H4; fax: 819-997-1679; royf@inac.gc.ca);

4. Indian and Northern Affairs of Canada – Comprehensive Claims Branch

(Contact: Ms. Louise Trepanier, Director, Claims East of Manitoba, Comprehensive Claims Branch, Department of Indian and Northern Affairs, 10 Wellington St., Room 1310, Gatineau QC K1A 0H4; 819-953-3109; trepanierl@inac.gc.ca)

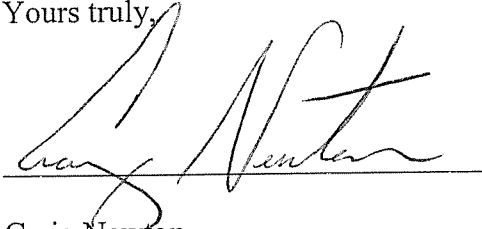
5. Ministry of the Attorney General – Aboriginal Legal Issues Office

(Contact: Ms. Ria Tzimas, Council, Crown Law Office-Civil, Ministry of the Attorney General, 720 Bay Street, 8th Floor, Toronto ON M5G 2K1; fax: 416-326-4181; ria.tzimas@ontario.ca)

Once identified, it is recommended that the proponent provide notification directly to the Aboriginal communities who may be affected by the project and provide them with an opportunity to participate in the planning of the project.

Should you have any further questions, please feel free to give me a phone call at (519) 873-5014 and I will do my best to answer them.

Yours truly,

A handwritten signature in black ink, appearing to read 'Craig Newton', is written over a horizontal line.

Craig Newton
Regional Environmental Planner / EA
Ministry of the Environment
Southwestern Region
(519) 873-5014

Cc – Mr. D. Hayes, Sr. Environmental Officer, MOE Sarnia District

Appendices (4)

Appendix “A” – Legislation Highlights

Environmental Protection Act, RSO 1990 (EPA)

Section 14: establishes general prohibition against creation of "adverse effects"

Section 27: prohibits alteration of a waste disposal site without a Certificate of Approval (CofA)

Section 46: requires approval for use (e.g., right-of-way) of any landfill which has been non-operational for 25 years or less

Section 91-123: establishes notification and cleanup requirements and liability for discharges related to spills

O.Reg. 347: regulates waste management

EPA S.9/ O.Reg. 346/ O.Reg. 419: regulate atmospheric emissions. Requires a CofA (Air) for construction, alteration, extension or replacement of any plan, structure, equipment, etc., that may result in atmospheric emission of contaminants or altered rate of emission. Contaminants include: gas, particulate, odour, heat, sound, vibration, etc.

Ontario Water Resources Act, RSO 1990 (OWRA)

Section 30(1): prohibits discharge of polluting material

Section 30(2): requires notification to Minister when polluting material is discharged or escapes into waterbody

Section 33(1): areas defined for protection of public water supply

Section 34(3)(c): requires a permit for the diversion or storage of water in excess of 50,000 litres per day

Section 34(4): requires a permit when water taking interferes with any public or private interest in any water

Section 53(1): requires approval of industrial sewage works. The approval is required for the establishment, alteration, extension or replacement of new or existing sewage works. As defined in Section 1, "sewage works" means any works for the collection, transmission, treatment and disposal of sewage, or any part of any such works and "sewage" includes drainage, stormwater, commercial wastes and industrial wastes

Environmental Assessment Act, RSO 1990 (EA)

Section 3: requires environmental assessment of undertakings by public bodies. This can affect pipelines on land or easements owned by public bodies (e.g., Ontario Hydro)

Appendix “B” - Highlighted Issues and Considerations

| Issue | Considerations |
|---------------------------------|---|
| Water Quality/Quantity | Surface and groundwater quality and quantity, including water in lakes, rivers, streams, wetlands and in the subsurface, as related to such activities as water crossings, blasting, dewatering, and hydrostatic testing of pipelines (and as it relates to permits to take water (PTTW), diversions, and discharge treatment requirements including such treatment as dechlorination, etc.) |
| Erosion and Sedimentation | Erosion and sedimentation controls and other practices for managing surface run-off and water crossings, to prevent entry of contaminants into water bodies, including proper discharge of hydrostatic test water and proper siting and disposal of excess fill and excavated material. |
| Sewage and Water Systems | Sewage treatment and water supply systems, including individual sewage system interference and individual water well interference. |
| Waste Management | <p>Management of waste materials generated as a result of the proposal, including those from:</p> <ul style="list-style-type: none"> • construction (e.g., waste from equipment maintenance), • excavation (e.g., contaminated sediments/soils), and • pipeline/facility operation <p><u>Note:</u> Management of waste should include its collection, storage, transport and disposal</p> |
| Sediment and Soil Contamination | <p>Management of sediment and soil contamination, including:</p> <ul style="list-style-type: none"> • identification of potential sources of contamination, (eg. Sampling protocols for the detection of historical contamination, as well as an assessment of contaminant sources inherent to the proposal itself, and their associated risk management) • determination of potential pathway(s) for contamination (eg. Existing subsurface pathways, etc.) • identification of control measures, • provision of proper containment, clean-up and disposal of contaminants |
| Air Quality | Air quality management, including the control of odour, dust and other contaminants during construction, operation (e.g., compressor stations) and contingency activities. |

| Issue | Considerations |
|--------------------------|---|
| Noise and Vibration | Noise and vibration during construction and during operation of facilities (e.g., compressor stations) |
| Land Use | Incompatible or conflicting land uses which affect or are affected by pipeline proposals (these include: existence of operating or non-operating landfill sites; existing or closed industrial sites both on or adjacent to the right-of-way and/or upstream of a water-crossing; and residences which might suffer adverse impact from noise and/or interference with water wells) |
| Stakeholder consultation | Need to evaluate the appropriate degree of consultation with interested parties such as the public, First Nations and government representatives/agencies. Initiated by the proponent in order to provide a two-way communication process to involve interested stakeholders in the planning, implementation and monitoring of an undertaking. The objective is to ensure responsible environmental decision-making, and protection of public interests. The goal of the process is the early identification of issues and their resolution where possible. |
| Spills | Spills management including contingency planning, notification, clean-up and restoration/restitution if required |
| Monitoring | Periodic inspection and surveillance of construction activities to ensure compliance with legislative requirements; review of sampling/analytical results to forecast and address environmental risk |

NOTE: The Ministry of Natural Resources, Petroleum Resource Centre in London Ontario should be contacted (Mr. Jug Manocha, Operations Engineer, Petroleum Resources Centre at 519-873-4637) regarding oil/gas or salt wells near/along the proposed pipeline routes.

APPENDIX C

EXCERPT FROM MOE JUNE 1991 WASTE DISPOSAL SITE INVENTORY
ACTIVE & CLOSED WASTE DISPOSAL SITES
LAMBTON COUNTY

JUNE 1991

EUROPEAN
COUNCIL



**Ministry
of the
Environment**

- 7 -

ACTIVE WASTE DISPOSAL SITES
SOUTHWESTERN REGION

REGIONAL INVENTORY OF ACTIVE WASTE DISPOSAL SITES

REGION: SOUTHWESTERN

| MAP ID NO | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | ZONE | EAST | NORTH | D | C | O | H | L | NH | SS | STAT'S CLASS |
|-----------------|----------|--------|------------------|-------------------------|---------------|-------|------|--------|---------|-----|----|-----|----|-----|-----|----|--------------|
| UTM COORDINATES | | | | | | | | | | | | | | | | | |
| 15 | A 162401 | HURON | USBORNE | PT 5 | SE BNDR | 40P06 | 17 | 475030 | 4798730 | 50 | 0 | 10 | 0 | 0 | 40 | 0 | A4 |
| 16 | A 162501 | HURON | WAWANOSH, EAST | PT 35 W1/2 | 3 | 40P14 | 17 | 462280 | 4846750 | 50 | 0 | 50 | 0 | 0 | 0 | 0 | A4 |
| 17 | A 162601 | HURON | WAWANOSH, WEST | PT 21 N1/2 | 8 | 40P13 | 17 | 459050 | 4057690 | 94 | 1 | 5 | 0 | 0 | 0 | 0 | B4 |
| 1 | A 021303 | KENT | CAMDEN | PT 5 S1/2 | 3 | 40J09 | 17 | 412000 | 4711300 | 90 | 0 | 10 | 0 | 0 | 0 | 0 | A4 |
| 2 | A 021304 | KENT | CAMDEN | PT 8 SW1/4 & W1/2 L 7 | 5 | 40J09 | 17 | 403500 | 4718050 | 0 | 5 | 95 | 0 | 0 | 0 | 0 | A3 |
| 3 | A 021601 | KENT | CAMDEN | 14-15 | 4 WCR | 40J08 | 17 | 413100 | 4685100 | 64 | 31 | 0 | 0 | 0 | 5 | 0 | A4 |
| 4 | A 021603 | KENT | HARWICH | PT 7 SW1/2 | TLR | 40I05 | 17 | 422400 | 4694200 | 85 | 10 | 2 | 0 | 0 | 0 | 0 | A4 |
| 5 | A 021701 | KENT | HARWICH | 11 | FRONT | 40I12 | 17 | 418800 | 4709050 | 98 | 2 | 0 | 0 | 0 | 0 | 0 | A4 |
| 6 | A 021801 | KENT | HOWARD | PT 4 N1/2 | 7 | 40I12 | 17 | 430400 | 4705550 | 85 | 5 | 5 | 0 | 0 | 5 | 0 | B4 |
| 7 | A 021903 | KENT | ORFORD | PT 6 | 8 | 40J08 | 17 | 397980 | 4683040 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | B4 |
| 8 | A 022002 | KENT | RALEIGH | PT 11 | 4 | 40J01 | 17 | 379750 | 4665750 | 98 | 0 | 2 | 0 | 0 | 0 | 0 | A4 |
| 9 | A 022103 | KENT | ROMNEY | LOT 182 N1/2 | Conc B | 40J08 | 17 | 398000 | 4683025 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | A3 |
| 10 | A 030104 | LAMTON | TILBURY EAST TWP | PT 10-11 | RANGE 3 | 40J16 | 17 | 386200 | 4755600 | 0 | 0 | 0 | 46 | 26 | 28 | 0 | A1 |
| 1 | A 030105 | LAMTON | SARNIA | PT 8-9 | RANGE 3 | 40J16 | 17 | 386250 | 4754900 | 0 | 0 | 80 | 0 | 0 | 20 | 0 | A3 |
| 2 | A 030107 | LAMTON | SARNIA | PT 10, 1 | RANGE 3 | 40J16 | 17 | 386620 | 4755550 | 0 | 0 | 0 | 5 | 60 | 35 | 0 | A1 |
| 3 | A 030112 | LAMTON | SARNIA * | PT 10, 11 | RANGE 2 RP122 | 40J16 | 17 | 386600 | 4754700 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | A1 |
| 30 | A 030113 | LAMTON | SARNIA * | 17-21 | RIVER R | 40J16 | 17 | 383050 | 4753175 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | A1 |
| 4 | A 030116 | LAMTON | SARNIA | PT 10, | RANGE 2 RP122 | 40J16 | 17 | 386650 | 4754800 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | A3 |
| 31 | A 030303 | LAMTON | PETROLIA | PT 16 S1/2 | 10 | 40J16 | 17 | 408490 | 4747000 | 68 | 20 | 2 | 0 | 0 | 10 | 0 | B4 |
| 5 | A 030330 | LAMTON | PETROLIA | Blind Line and Tank St. | LRE | 41J16 | 17 | 406500 | 4750100 | 0 | 0 | 0 | 0 | 50 | 50 | 0 | A1 |
| 6 | A 031301 | LAMTON | BOSANQUET | PT 15, S of E1/2 | 12 | 40P05 | 17 | 434680 | 4790240 | 93 | 5 | 2 | 0 | 0 | 0 | 0 | A3 |
| 7 | A 031402 | LAMTON | BROCKE | PT 21 E1/2 | 5 | 40J16 | 17 | 406800 | 4749050 | 90 | 0 | 10 | 0 | 0 | 0 | 0 | B4 |
| 8 | A 031502 | LAMTON | DAHN | PT 12 | 12 | 40J16 | 17 | 406340 | 4726350 | 80 | 0 | 20 | 0 | 0 | 0 | 0 | A4 |
| 9 | A 031602 | LAMTON | ENWICKILL | PT E 1/2 26 | 12 | 40J16 | 17 | 384100 | 471200 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | A1 |
| 10 | A 031801 | LAMTON | MOORE | PT 16-19 | FRONT | 40J16 | 17 | 380930 | 4739460 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | A2 |
| 11 | A 031802 | LAMTON | MOORE | PT 8 & 9 | 10 | 40J16 | 17 | 393770 | 4747570 | 0 | 0 | 0 | 0 | 9 | 10 | 81 | A4 |
| 12 | A 031806 | LAMTON | MOORE ** | PT 3 | 9 | 40J16 | 17 | 397360 | 4747070 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | A2 |
| 13 | A 031807 | LAMTON | MOORE | PT 21 N1/2 | 5 | 40J16 | 17 | 386830 | 4741870 | 70 | 20 | 10 | 0 | 0 | 0 | 0 | B2 |
| 14 | A 031808 | LAMTON | MOORE | PT 22 W1/2 | 12 | 40J16 | 17 | 385850 | 4750950 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | A4 |

* Land Farming ** Brine Well. A 011501E is A 011501 Partitioned to receive Industrial Waste.

REGIONAL INVENTORY OF ACTIVE WASTE DISPOSAL SITES

REGION: SOUTHWESTERN

| MAP | SITE | NO | COUNTY | MUNICIPALITY | OR STREET NO | CONCESS | NTS | ZONE | EAST | NORTH | D | C | O | H | L | NH | SS | STAT'S CLASS |
|-------|----------|-----------|-------------------|-------------------------------|--------------|---------|-----|--------|---------|-------|----|-----|---|---|-----|----|----|--------------|
| ID NO | | | | | LOT | | | | | | | | | | | | | |
| 18 | A 031819 | LAMBTON | MOORE * | PT 67-68 | FRONT | 40J16 | 17 | 302000 | 4750870 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | A1 |
| 32 | A 031820 | LAMBTON | MOORE | PT 24 | 12 | 40J16 | 17 | 385800 | 4750900 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| 33 | A 031821 | LAMBTON | MOORE | PT 25 | 9 | 40J16 | 17 | 384000 | 4749100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A1 |
| 19 | A 031901 | LAMBTON | PLYMPTON | PT 29 & 30 | 13 | 40001 | 17 | 417400 | 4770160 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| 20 | A 032001 | LAMBTON | SARNIA ** | PT 7 | 1 | 40J16 | 17 | 395340 | 4751500 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A4 |
| 21 | A 032002 | LAMBTON | SARNIA | PT 11 & 12 | 3 | 40J16 | 17 | 392340 | 4755160 | 80 | 18 | 2 | 0 | 0 | 0 | 0 | 1 | B4 |
| 22 | A 032005 | LAMBTON | SARNIA | PT 17 W 1/2 | 8 | 40J16 | 17 | 389470 | 4761380 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| 23 | A 032006 | LAMBTON | SARNIA | PT 47-51 | FRONT | 40J16 | 17 | 389700 | 4762450 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| 26 | A 032014 | LAMBTON | SARNIA | PT 42-43 N | 9 | 40001 | 17 | 391000 | 4763270 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| 27 | A 032103 | LAMBTON | SOMBRA | PT 11 | 12 | 40J09 | 17 | 386230 | 4731130 | 80 | 10 | 10 | 0 | 0 | 0 | 0 | 1 | A4 |
| 29 | A 032203 | LAMBTON | WARRICK | PT 20 E1/2 | 3 SER | 40P04 | 17 | 429150 | 4758150 | 50 | 10 | 0 | 0 | 0 | 40 | 0 | 1 | A4 |
| 1 | A 040201 | MIDDLESEX | PARKHILL | PT 7 | PLAN 562 | 40P04 | 17 | 443780 | 4779620 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| 2 | A 040901 | MIDDLESEX | ADELAIDE | PT 15 E1/2 | 1 NER | 40P04 | 17 | 444650 | 4762550 | 95 | 3 | 1 | 0 | 0 | 1 | 0 | 1 | B4 |
| 3 | A 041002 | MIDDLESEX | BIDDULPH | PT 24 | 3 | 40P03 | 17 | 465830 | 4783490 | 75 | 5 | 5 | 0 | 0 | 15 | 0 | 1 | A4 |
| 4 | A 041101 | MIDDLESEX | CARADOC | PT 20 N1/2 | 1 | 40114 | 17 | 461640 | 4750070 | 94 | 1 | 0 | 0 | 0 | 5 | 0 | 1 | A3 |
| 5 | A 041202 | MIDDLESEX | DELAWARE | PT 7-8 | 0 | 40114 | 17 | 465250 | 4748600 | 99 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | A4 |
| 6 | A 041305 | MIDDLESEX | DORCHESTER, NORTH | PT 14 N1/2 | 4 SRT | 40114 | 17 | 498240 | 4752770 | 94 | 5 | 1 | 0 | 0 | 0 | 0 | 1 | A4 |
| 7 | A 041403 | MIDDLESEX | EKFRID | PT 22 N1/2 | RANGE 1 | 40112 | 17 | 444900 | 4731480 | 75 | 5 | 0 | 0 | 0 | 20 | 0 | 1 | A4 |
| 8 | A 041502 | MIDDLESEX | LOBO | PT 6 | 2 | 40114 | 17 | 464750 | 4755860 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| 9 | A 041701 | MIDDLESEX | MCGILLIVRAY | PT 15-16 | 16 | 40P04 | 17 | 451670 | 4782940 | 80 | 0 | 20 | 0 | 0 | 0 | 0 | 1 | A4 |
| 10 | A 041801 | MIDDLESEX | METCALFE | PT 13 | 2 | 40113 | 17 | 443070 | 4752280 | 90 | 0 | 10 | 0 | 0 | 0 | 0 | 1 | B4 |
| 11 | A 041902 | MIDDLESEX | MOSA | PT 23 | 3 | 40112 | 17 | 431080 | 4723850 | 90 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | A4 |
| 8 | A 070808 | OXFORD | SW OXFORD | N/PT 12 RP/41R1300 & N/3/4 11 | 2 | 40115 | 17 | 476040 | 5015400 | 40 | 0 | 10 | 0 | 0 | 50 | 0 | 1 | A4 |
| 1 | A 150101 | PERTH | STRATFORD | PT 44,4,5,7 | 2 | 40P07 | 17 | 503450 | 4800120 | 75 | 15 | 0 | 0 | 0 | 10 | 0 | 1 | A3 |
| 3 | A 150301 | PERTH | LISTOWEL | 28 | 1 | 40P10 | 17 | 503320 | 4843420 | 40 | 50 | 0 | 0 | 0 | 10 | 0 | 1 | A3 |
| 4 | A 150401 | PERTH | MITCHELL | PT 19 | 1 | 40P06 | 17 | 483470 | 4814560 | 70 | 20 | 0 | 0 | 0 | 10 | 0 | 1 | A4 |
| 5 | A 150601 | PERTH | BLANSHARD | PT 18 | EMR | 40P06 | 17 | 483210 | 4788460 | 80 | 5 | 15 | 0 | 0 | 0 | 0 | 1 | A4 |
| 6 | A 150701 | PERTH | DOWNIE | 15 | 2 | 40P06 | 17 | 495390 | 4803560 | 70 | 10 | 20 | 0 | 0 | 0 | 0 | 1 | A4 |
| 7 | A 151001 | PERTH | ELLICE | 11 | 14 | 40P10 | 17 | 505050 | 4816420 | 75 | 10 | 15 | 0 | 0 | 0 | 0 | 1 | A4 |

and Farming ** Brine Well. A 011501E is A 011501 Partitioned to receive Industrial Waste.

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CLOSED WASTE SITE INVENTORY
SOUTHWESTERN REGION

REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES

REGION: SOUTHWESTERN

| MAP ID NO | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESS | NTS | ZONE | EAST | NORTH | DATE CLOSED YEAR/MON/DAY | CLAS |
|--------------|------------|--------|--------------|---|---------|-------|------|--------|---------|-----------------------------|------|
| 27 | X 2067 | KENT | CHATHAM | Merritt St. & Riverview Dr. 8-9, 17-18 | 293 | 40J08 | 17 | 401250 | 4694575 | 1966 | * NP |
| 29 | X 5088 | KENT | WHEATLEY | 10 | 1 ECR | 40J01 | 17 | 379360 | 4661080 | 1974 | * A4 |
| 30 | X 5108 | KENT | HARWICH | McGregor Park | 5 | 40I05 | 17 | 418550 | 4688400 | 1969 | * B7 |
| 31 | X 5109 | KENT | BLENNHEIM | 3 | 5 | 40I05 | 17 | 416750 | 4686750 | 1954 | * NP |
| 32 | X 5110 | KENT | ORFORD | 10 | 10 | 40I05 | 17 | 431900 | 4703800 | 1964 | * B7 |
| 33 | X 5111 | KENT | HIGHGATE | 100 | STR | 40J08 | 17 | 401750 | 4682890 | 1968 | * HP |
| 34 | X 5112 | KENT | HOWARD | 20 | 5 | 40I05 | 17 | 427500 | 4690550 | 1969 | * B7 |
| 35 | X 5113 | KENT | HARWICH | 12 | 2 | 40I12 | 17 | 422375 | 4690210 | * | * NP |
| 36 | X 5114 | KENT | HOWARD | 8 | 2 WCR | 40I05 | 17 | 421100 | 4707600 | 1972 | * NP |
| 37 | X 5127 | KENT | HARWICH | 12, 15 | 2 RT | 40J08 | 17 | 408820 | 4680900 | * | * NP |
| 38 | X 5128 | KENT | HARWICH | 4 | 3 | 40J09 | 17 | 401525 | 4716100 | 1972 | * B7 |
| 39 | X 6067 | KENT | CAMDEN | 1 | 7 | 40J09 | 17 | 406550 | 4714825 | 1971 | * NP |
| 40 | X 6068 | KENT | CAMDEN | 4 | 4 | 40J09 | 17 | 402200 | 4716350 | 1955 | * A8 |
| 41 | X 6069 | KENT | CAMDEN | 3 | 4 | 40J09 | 17 | 402075 | 4715390 | 1965 | * NP |
| 42 | X 6070 | KENT | CAMDEN | 23 | 3 CHATH | 40J09 | 17 | 392960 | 4718600 | * | * B7 |
| 43 | X 6071 | KENT | CAMDEN | 2 | 2 | 40J09 | 17 | 399475 | 4715400 | 1960 | * NP |
| 44 | X 6072 | KENT | CAMDEN | 5 | 4 | 40J09 | 17 | 382175 | 4720375 | 1968 | * NP |
| 45 | X 6073 | KENT | CHATHAM | 13 | A | 40I12 | 17 | 418500 | 4711225 | 1968 | * B7 |
| 46 | X 6074 | KENT | CAMDEN | 14 | A | 40I12 | 17 | 418200 | 4712440 | 1952 | * B7 |
| 47 | X 6075 | KENT | CAMDEN | 17 | RIVER R | 40J16 | 17 | 382600 | 4753350 | 1979 | A1 |
| 1 | A 030101 | LAMTON | SARNIA | Scott Rd. | RIVER R | 40J16 | 17 | 386200 | 4755580 | 1975 | A1 |
| 2 | A 030102 | LAMTON | SARNIA | 19 | 6 | 40J16 | 17 | 380400 | 4739780 | 1973 | B2 |
| 3 | A 030103 | LAMTON | SARNIA | Vidal St. | PLAN 3 | 40J16 | 17 | 381930 | 4754005 | 1974 | A1 |
| 4 | A 030106 | LAMTON | SARNIA | 19 | 1 | 40P09 | 17 | 428500 | 4768955 | 1979 | A1 |
| 5 | A 030401 | LAMTON | WARRICK | PT 18-19 | 14 | 40J16 | 17 | 409550 | 4737640 | 1976 | A6 |
| 7 | A 030801 | LAMTON | OIL SPRINGS | 17 | 5 | 40P04 | 17 | 432890 | 4777970 | 1975 | B6 |
| 8 | A 031302 | LAMTON | BOSANQUET | PT 22 W1/2 | 2 | 40J09 | 17 | 416710 | 4727000 | 1975 | A6 |
| 9 | A 031501 | LAMTON | DAWN | 31 | 5 | 40J16 | 17 | 417550 | 4740400 | 1974 | B6 |
| 10 | A 031601 | LAMTON | ENHISKILLEN | 26-27 | 2 | 40J09 | 17 | 382705 | 4737770 | 1980 | A6 |
| 11 | A 031803 | LAMTON | MOORE | | | | | | | | |

* Year/Month/Day unknown.

REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
REGION: SOUTHWESTERN

| MAP ID NO | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESS | NTS | ZONE | EAST NORTH | DATE CLOSED YEAR/MON/DAY | CLAS |
|-----------|----------|---------|--------------|-------------------------------|---------|-------|------|----------------|--------------------------|------|
| 12 | A 031804 | LAMBTON | MOORE | 9 | 10 | 40J16 | 17 | 393775 4747600 | 1975 5 22 | A2 |
| 13 | A 031815 | LAMBTON | MOORE | 9 | 10 | 40J16 | 17 | 393775 4747600 | 1979 12 31 | B5 |
| 43 | A 031818 | LAMBTON | MOORE | PT 3 | 7 | 40J16 | 17 | 397220 4744130 | 1985 12 31 | A4 |
| 14 | A 031902 | LAMBTON | PLYMPTON | 11 | 4 | 40J16 | 17 | 405725 4758205 | 1980 7 17 | B5 |
| 15 | A 032003 | LAMBTON | SARNIA | 15 | 4 | 40J16 | 17 | 390340 4756275 | 1971 11 15 | A6 |
| 16 | A 032007 | LAMBTON | SARNIA | PT 8 | 2 | 40J16 | 17 | 394910 4753320 | 1981 2 1 | A6 |
| 17 | A 032008 | LAMBTON | SARNIA | PT 4 | 3 | 40J16 | 17 | 397020 4754550 | 1981 2 1 | A4 |
| 18 | A 032009 | LAMBTON | SARNIA | Vidal St. | 1 | 40J16 | 17 | 382910 4754140 | 1976 1 13 | A1 |
| 44 | A 032010 | LAMBTON | SARNIA | PT 4 | 15 | 40J16 | 17 | 397300 4752520 | 1985 12 31 | A4 |
| 19 | A 032105 | LAMBTON | SOMBRA | PT 3 | 1 | 40P04 | 17 | 381770 4735460 | 1982 11 1 | A1 |
| 20 | A 032201 | LAMBTON | WARWICK | 16 | 5 | 40I13 | 17 | 426650 4761870 | 1974 4 30 | A6 |
| 21 | A 032202 | LAMBTON | WARWICK | 19 | 5 | 40J16 | 17 | 428460 4755375 | 1975 8 15 | A6 |
| 22 | X 2068 | LAMBTON | MOORE | 66 | RIVER F | 40J16 | 17 | 381250 4750325 | 1964 * | B7 |
| 23 | X 5017 | LAMBTON | POINT EDWARD | Michigan Ave & C.H.R. tracks | | 40J16 | 17 | 385690 4761300 | 1930 * | B7 |
| 24 | X 5018 | LAMBTON | POINT EDWARD | Michigan Ave & Kendall St. | | 40J16 | 17 | 385690 4761050 | 1971 * | B5 |
| 25 | X 5115 | LAMBTON | PLYMPTON | 12 | 4 | 40J16 | 17 | 408375 4757850 | * | B7 |
| 26 | X 5116 | LAMBTON | SARNIA | Agincourt Park | | 40001 | 17 | 388575 4762100 | 1952 * | NP |
| 27 | X 5117 | LAMBTON | SARNIA | Murphy & Erroll Rd. | | 40001 | 17 | 388550 4762300 | 1953 * | NP |
| 28 | X 5118 | LAMBTON | SARNIA | Newton Park | | 40J16 | 17 | 388150 4762375 | 1955 * | NP |
| 29 | X 5119 | LAMBTON | POINT EDWARD | Michigan Ave. & Christina St. | | 40J16 | 17 | 385925 4761400 | 1946 * | B5 |
| 30 | X 5120 | LAMBTON | SARNIA | Reyburne Ave. & Lincoln Pk. | | 40J16 | 17 | 387240 4759150 | 1939 * | NP |
| 31 | X 5121 | LAMBTON | SARNIA | 46-47 | 9 | 40001 | 17 | 389950 4763050 | 1967 * | B5 |
| 32 | X 5122 | LAMBTON | SARNIA | PT 15 MID | 4 | 40J16 | 17 | 390340 4756375 | 1974 * | B5 |
| 33 | X 5123 | LAMBTON | BOSANQUET | 17 | 1 | 40P04 | 17 | 433245 4777975 | 1971 * | B7 |
| 34 | X 5124 | LAMBTON | BOSANQUET | 18 | 2 | 40P04 | 17 | 432150 4778475 | 1966 * | B7 |
| 37 | X 5129 | LAMBTON | PLYMPTON | 17 | 5 | 40J16 | 17 | 410000 4759000 | 1964 * | B7 |
| 38 | X 6077 | LAMBTON | BROOKE | PT 20 S1/2 | 5 | 40I13 | 17 | 430140 4739675 | 1938 * | A4 |
| 39 | X 6078 | LAMBTON | EUPHENIA | PT 29 W1/2 | 4 | 40I12 | 17 | 422350 4729800 | 1970 * | A7 |
| 40 | X 6079 | LAMBTON | DAHN | PT 22 W1/2 | 14 | 40J09 | 17 | 416720 4727000 | 1960 * | A8 |
| 41 | X 6080 | LAMBTON | SOMBRA | PT 2 W1/2 | 5 | 40J09 | 17 | 380950 4721800 | 1962 * | NP |

REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
REGION: SOUTHWESTERN

| MAP ID NO | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESS | NTS | ZONE | UTM COORDINATES EAST NORTH | DATE CLOSED YEAR/MON/DAY | CLAS |
|--------------|------------|-----------|-------------------|------------------------|---------------|-------|------|-------------------------------|-----------------------------|----------|
| 42 | X 6081 | LAMBTON | MOORE | PT 26 N1/2 | 11 | 40J16 | 17 | 383725 4750025 | 1965 | * * B2 |
| 1 | A 040102 | MIDDLESEX | LONDON | 1-2, 16 | RP29;RP | 40I14 | 17 | 478500 4756650 | 1971 | 6 15 A7 |
| 2 | A 040103 | MIDDLESEX | LONDON | 2-3 | RP266 | 40I14 | 17 | 483840 4757446 | 1954 | 6 15 A7 |
| 3 | A 040104 | MIDDLESEX | WESTMINSTER | PT 19-22 | 1 | 40I14 | 17 | 484025 4755117 | * | 12 31 A1 |
| 4 | A 040105 | MIDDLESEX | LONDON | PT 3-4 | A | 40I14 | 17 | 487540 4757820 | 1954 | 7 1 A1 |
| 6 | A 040301 | MIDDLESEX | STRATHROY | Metcalfe St. E. | | 40I13 | 17 | 447300 4754650 | 1973 | 12 31 A6 |
| 7 | A 041001 | MIDDLESEX | BIDDULPH | 29 | 2 | 40P03 | 17 | 465070 4781475 | * | 12 31 B7 |
| 8 | A 041103 | MIDDLESEX | CARADOC | PT 5 | 9 | 40I13 | 17 | 455125 4747350 | 1955 | 1 31 B5 |
| 10 | A 041302 | MIDDLESEX | DORCHESTER, NORTH | PT 18 S1/2 | 1 | 40I14 | 17 | 501750 4756340 | 1970 | 12 15 A6 |
| 11 | A 041401 | MIDDLESEX | EKFRID | PT 23 | 1 | 40I13 | 17 | 442460 4733190 | 1972 | 12 31 B5 |
| 12 | A 041402 | MIDDLESEX | EKFRID | PT 8 | 3 | 40I13 | 17 | 449090 4739675 | 1959 | 12 31 B7 |
| 13 | A 041501 | MIDDLESEX | LOBO | 6 | 2 | 40I14 | 17 | 464950 4755775 | 1949 | 6 30 B8 |
| 14 | A 041601 | MIDDLESEX | LONDON | PT 28 N1/2 | 5 | 40I14 | 17 | 472790 4761500 | * | 12 31 A4 |
| 98 | A 042004 | MIDDLESEX | MISSOURI, WEST | PT 20 - 21 | 2 | 40P03 | 17 | 485100 4774130 | 1986 | 12 27 A3 |
| 17 | A 042101 | MIDDLESEX | WESTMINSTER | PT 76 SE1/4 | W.T.R. | 40I14 | 17 | 473940 4752420 | 1971 | 10 15 A6 |
| 99 | A 042102 | MIDDLESEX | WESTMINSTER | PT 18-20 | 6 | 40I14 | 17 | 481920 4747000 | * | * * A7 |
| 100 | A 042133 | MIDDLESEX | WESTMINSTER | PT 69 & 70 | Con W.N.B.T.R | 40I14 | 17 | 475000 4749900 | 1981 | 7 12 B3 |
| 101 | A 042301 | MIDDLESEX | WILLIAMS, WEST | PT 21 N1/2 | 7 | 40P04 | 17 | 435650 4769130 | * | * * A4 |
| 20 | X 5001 | MIDDLESEX | PARKHILL | 87 | PLAN 56 | 40P04 | 17 | 444400 4778850 | 1971 | * * A8 |
| 21 | X 5002 | MIDDLESEX | PARKHILL | 89 | PLAN 56 | 40P04 | 17 | 444400 4778850 | 1948 | * * NP |
| 22 | X 5003 | MIDDLESEX | STRATHROY | Mill Pond Street | | 40I13 | 17 | 449300 4755000 | 1941 | * * NP |
| 23 | X 5004 | MIDDLESEX | STRATHROY | Carroll St. & Park St. | | 40I13 | 17 | 449300 4755000 | 1964 | * * A8 |
| 26 | X 5007 | MIDDLESEX | BIDDULPH | 2 | 2 | 40P03 | 17 | 465175 4782300 | 1960 | * * NP |
| 27 | X 5008 | MIDDLESEX | CARADOC | 18 | RIN | 40I14 | 17 | 462350 4748010 | 1962 | * * A8 |
| 28 | X 5009 | MIDDLESEX | CARADOC | 15 | 1 | 40I13 | 17 | 456400 4744320 | 1965 | * * A8 |
| 30 | X 5011 | MIDDLESEX | EKFRID | 8 | 1 | 40I13 | 17 | 449725 4740050 | 1954 | * * NP |
| 31 | X 5012 | MIDDLESEX | LONDON | 28 | 7 | 40P03 | 17 | 469220 4763850 | * | * * NP |
| 32 | X 5013 | MIDDLESEX | PARKHILL | John Street | | 40P04 | 17 | 444400 4778850 | 1954 | * * NP |
| 33 | X 5014 | MIDDLESEX | MCGILLIVRAY | 23 | 5 | 40P04 | 17 | 455225 4777675 | 1969 | * * B8 |
| 34 | X 5015 | MIDDLESEX | MCGILLIVRAY | 5-6 | 9 | 40P04 | 17 | 458160 4788000 | 1973 | * * NP |

* Year\Month\Day unknown.

Appendix “D” – Water Course Crossing Considerations

With respect to watercourse crossings consideration should be given to:

- a) watershed or sub-watershed plans where they exist or are being developed.
- b) the sensitivity of the watercourse (note: consultation with relevant agencies is recommended)
- c) minimizing the number of water crossings
- d) avoiding headwaters of the watershed as well as groundwater recharge areas, spring sources, nutrient sensitive watercourses, cold water streams
- e) avoiding avoid fish habitat such as spawning beds, migration routes, nursery and feeding areas
- f) avoiding water crossings involving contaminated sediments where possible.
- g) minimizing any impacts on downstream uses, such as water supply intakes,
- h) minimizing bank disturbance (i.e., grading and vegetation removal) by choosing crossing locations that naturally provide a suitable staging area for equipment and materials
- i) the composition and contour of the stream bed and channel in terms of their erosion and deposition equilibrium, and their potential for restoration to original equilibrium

Note: MNR local offices should be consulted as to the requirements of the Federal Fisheries Act and the federal Department of Fisheries and Oceans (“DFO”). Any harmful alteration, disruption or destruction of fish habitat will require authorization from the DFO.

Appendix B4

Public Open House Notification and Newsletter



Stantec

March 5, 2007

Dear

**Reference: Enbridge Gas Distribution Inc. – Tecumseh Compressor Station to
Ladysmith Natural Gas Storage Pool**

Stantec Consulting Ltd. (“Stantec”) has been retained by Enbridge Gas Distribution Inc. (“Enbridge”) to update an Environmental Report (ER) that was initially prepared in 1993. The proposed project involves the construction of a 20-inch (508-millimeters) diameter natural gas pipeline to be constructed between Enbridge’s Tecumseh Compressor Station and their Ladysmith Natural Gas Storage Pool. The length of this pipeline will be approximately 4-kilometers.

Since our last correspondence on June 21, 2006, a preliminary preferred route has been selected. This route travels west from the Tecumseh Compressor Station along the boundary of Concession VII and VIII. The route then travels south along the middle of Lot 19 then west along the middle of Concession V. Finally, the route travels southward along the lot line between lots 19 and 20 to end at the Ladysmith Natural Gas Storage Pool. Please see attached map for further details.

Stantec’s ER will accompany Enbridge’s application to the Ontario Energy Board expected in June of 2007. The Ontario Energy Board is the body that regulates the energy sector in the province and whose review and approval is required before this project can proceed. If approved, construction of the pipeline would begin in 2008.

Stantec is presently compiling an environmental, socio-economic and archaeological inventory of the Study Area. As an agency with jurisdiction or an interest in developments in the Study Area, you are invited to provide comments, or co-ordinate comments, regarding the proposed pipeline. Specifically, Stantec is seeking information regarding planning principles or guidelines implemented by your agency that may affect routing, construction, and operation of the proposed pipeline. Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory of the Study Area.

Information regarding other proposed developments in the Study Area is also requested at this time for incorporation into the ER study as a component of a cumulative effects assessment. Please contact us to discuss the most efficient way to obtain this information.

March 5, 2007

Page 2 of 2

Reference: Enbridge Gas Distribution Inc. – Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool

Your agency's response by April 6, 2007 would be appreciated.

A Public Open House will be held to explain the proposed pipeline project, and present an opportunity for any interested parties to provide input. Details regarding the Public Open House are as follows:

**Sixth Line United Church
1201 Moore Line
Mooretown, Ontario
March 21, 2007
6:00 pm to 9:00 pm**

If you have any questions, please do not hesitate to contact me at (519) 836-6050.

Sincerely,

STANTEC CONSULTING LTD.

A handwritten signature in black ink, appearing to read 'David Wesenger', written in a cursive style.

David Wesenger
Senior Project Manager
Tel: (519) 836-6050
Fax: (519) 836-2493
david.wesenger@stantec.com



Stantec

March 5, 2007

Dear Resident:

**Reference: Enbridge Gas Distribution Inc. –Tecumseh Compressor Station to
Ladysmith Natural Gas Storage Pool**

Stantec Consulting Ltd. ("Stantec") has been retained by Enbridge Gas Distribution Inc. ("Enbridge") to update an Environmental Report (ER) that was initially prepared in 1993. The proposed project involved the construction of a 20-inch (508-millimeters) diameter natural gas pipeline to be constructed between Enbridge's Tecumseh Compressor Station and their Ladysmith Natural Gas Storage Pool. The length of this pipeline will be approximately 4-kilometers.

A preliminary preferred route has been selected. This route travels west from the Tecumseh Compressor Station along the boundary of Concession VII and VIII. The route then travels south along the middle of Lot 19 then west along the middle of Concession V. Finally, the route travels southward along the lot line between lots 19 and 20 to end at the Ladysmith Natural Gas Storage Pool. Please see attached map for further details.

Stantec's ER will accompany Enbridge's application to the Ontario Energy Board expected in June of 2007. The Ontario Energy Board is the body that regulates the energy sector in the province and whose review and approval is required before this project can proceed. If approved, construction of the pipeline would begin in 2008.

This pipeline may be built adjacent to, opposite from, or across property owned by you. To learn more about the project and to provide input to the planning process, we invite you to attend an upcoming Public Open House hosted by Stantec. Input received at the Public Open House will be used to help develop or confirm route selection, and site-specific protection and mitigation measures. Representatives from Enbridge will also be available at the Public Open House to answer your questions. Details regarding the Public Open House are as follows:

**Sixth Line United Church
1201 Moore Line
Mooretown, Ontario
March 21, 2007
6:00 pm to 9:00 pm**

March 5, 2007

Page 2 of 2

Reference: Enbridge Gas Distribution Inc. –Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool

We hope that you will attend the Public Open House. If you or a representative are not able to join us, as always, we welcome your call (519) 836-6050.

Sincerely,

STANTEC CONSULTING LTD.

A handwritten signature in black ink, appearing to read 'David Wesenger', written in a cursive style.

David Wesenger
Senior Project Manager
Tel: (519) 836-6050
Fax: (519) 836-2493
david.wesenger@stantec.com

Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool

An Enbridge Storage Operations Pipeline Project

Information Newsletter March 21st, 2007.

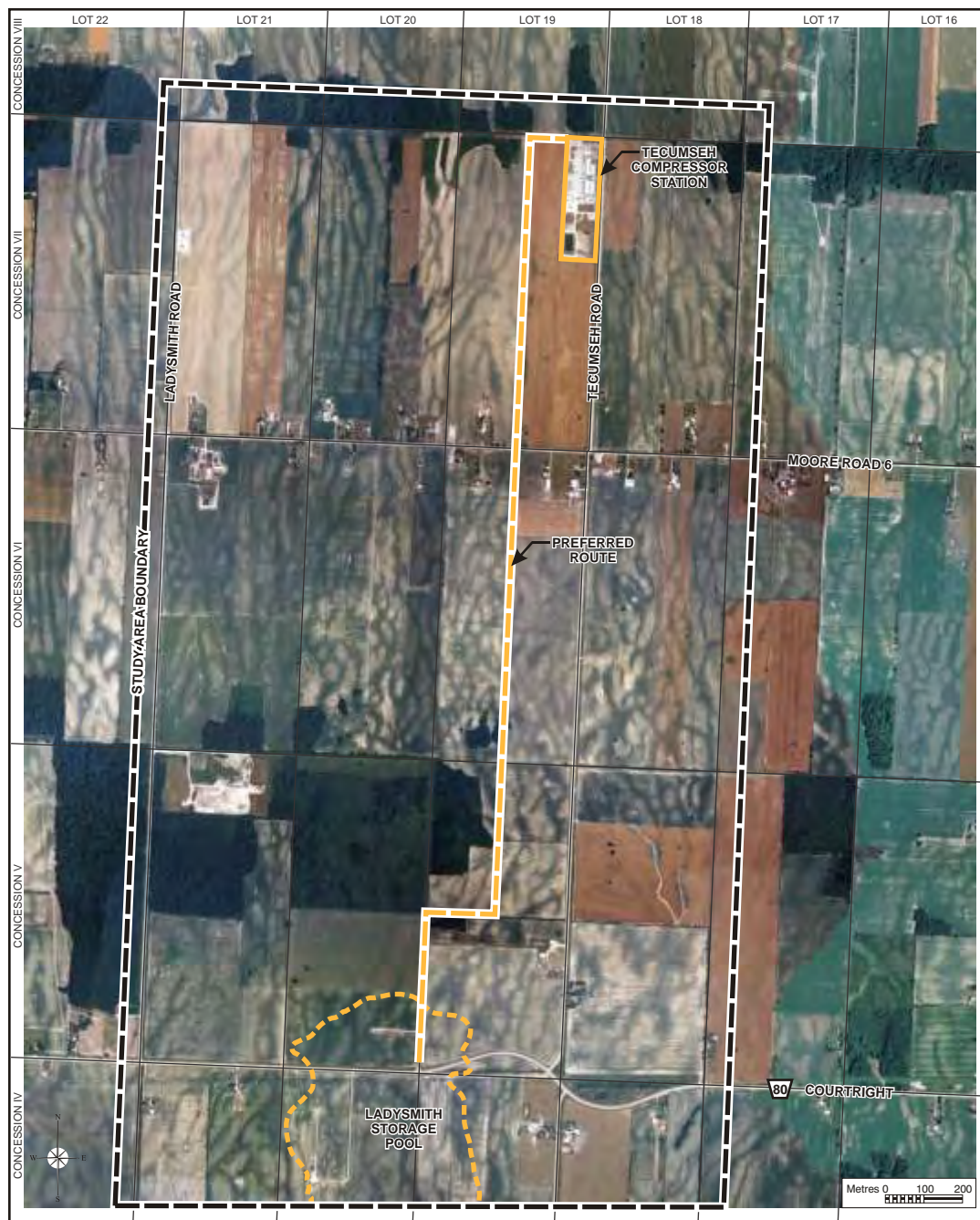


THE PROJECT

Enbridge Gas Storage Operations ("Enbridge"), a business unit of Enbridge Gas Distribution Inc., is proposing to construct a natural gas pipeline between their Tecumseh Compressor Station and their Ladysmith Natural Gas Storage Pool (St. Clair Township, Lambton County).

The proposed project involves the construction of a 20-inch (508-millimetre) steel natural gas pipeline. A preliminary preferred route has been selected for this pipeline. This route travels west from the Tecumseh Compressor Station along the boundary of Concession VII and VIII. The route then travels south along the middle of Lot 19 then west along the middle of Concession V. Finally, the route travels southward along the lot line between lots 19 and 20 to end at the Ladysmith Natural Gas Storage Pool.

Enbridge provides safe, reliable delivery of environmentally preferred natural gas to approximately 1.8 million residential, commercial, and industrial customers across Ontario. Enbridge is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.



PUBLIC OPEN HOUSE

This Public Open House aims to provide interested and affected parties with an opportunity to review and comment on the proposed Enbridge pipeline project. Input received at this Public Open House will be used by Stantec Consulting Ltd. ("Stantec"), an independent environmental consultant, to develop or confirm route selection, and site-specific protection

and mitigation measures, which will be detailed in an Environmental Report (ER). Stantec's ER will be part of an application by Enbridge to the Ontario Energy Board (OEB) expected in Spring 2007. The OEB is the body responsible for reviewing and approving all pipeline projects.

Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool

An Enbridge Storage Operations Pipeline Project

Information Newsletter March 21st, 2007.



LET US KNOW WHAT YOU'RE THINKING

We are interested in hearing your comments, addressing questions, and working with the communities and residents along the preferred route to ensure the smooth and orderly development of the project.

Our ongoing approach to public communications and consultation includes a mix of providing information on the project plans and receiving input from interested people through the Public Open House, exit questionnaires provided at the Public Open House, and newsletters. Meetings with individual property-owners or groups who may be directly affected by the proposed project can be arranged to discuss project details and concerns.

At the Public Open House, we particularly want your input on the preliminary preferred route, the study process, and any other interests you might have regarding this project. You may provide comments at any point in the ER process.



WHAT HAPPENS AFTER THE PUBLIC OPEN HOUSE?

After the Public Open House, Stantec will evaluate the exit questionnaire results and other input and use this information to confirm the merits of the proposed route. Enbridge will also confirm the final alignment of the preferred route using this public information and other inputs, as well as financial and technical considerations. It is Enbridge's hope that meetings with directly affected landowners can be scheduled to obtain information about individual property concerns related to the project.

The ER (to be completed in April 2007) will outline the plans to reduce and control effects of the pipeline on the environment, identify plans to monitor the project, and any other contingencies.

WHAT'S NEXT?

- Analysis of public input (March 2007)
- Confirmation of preferred route (March 2007)
- ER report completion (April 2007)
- Application to OEB (Spring 2007)
- Ongoing public consultation (Summer 2007)
- Land agent contact with directly affected landowners (Summer 2007)
- Construction subject to OEB approval (2008)
- Pipeline operation and maintenance (2008-onwards)

CONTACT THE PROJECT TEAM

For general inquiries contact:

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Appendix B5

Public Open House Exit Questionnaire Summary

Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool

An Enbridge Gas Storage Operations Pipeline Project

- I don't understand how your previous study can be used to include this line. The other study was in a existing corridor of pipelines and hydro towers. This line is where there has been no lines.

4. Considering the location of the preliminary preferred route shown on the displays, are there any potential effects to you, your property, or business that need to be addressed prior to, or during construction and operation of the pipeline.

(Please check one) Yes 5 No 3

If yes, please describe:

- Would seem more logical, safer, and less invasive to use the existing hydro corridor route
- Drainage
- Tile drainage, land restoration, crop loss, etc.
- Unknown as the Preferred Route follows property line centre and for approx. 85% of the route.
- Drainage tile disturbance, abandonment and liability, restrictions on land use after construction, soil management during construction and maintenance, and wood lot damage.
- Drainage of land affected by pipeline.

5. Were your questions answered through the display boards and the on site staff?

(Please check one) Yes 5 No 1 Partly 4

Please let us know if you have any other questions or concerns about this proposed project that you would like to bring to our attention.

- Route, nothing mentioned about depth of pipe or integrity digs, and abandonment issues
- Why no local input before preferred route proposal
- Why can't the original Ladysmith Pipeline easement that is 90+% in a utility corridor be used for the new line. This must be an acceptable practice as its shown in your information newsletter of March 21/07.

6. Would you like to meet with, or be contacted by, Stantec or Enbridge representatives to discuss any questions or concerns?

(Please check one) Yes 3 No 3

Please provide us with your contact information:

Name: _____

Address: _____

Phone: (home) _____ (work) _____

Email: _____

Convenient time you can be reached: _____



Stantec

Thank you for completing this exit questionnaire.

Do you consent to comments being included in the public record

Yes 8 Yes, but anonymously 1 No 1

Signature: _____

Date: _____

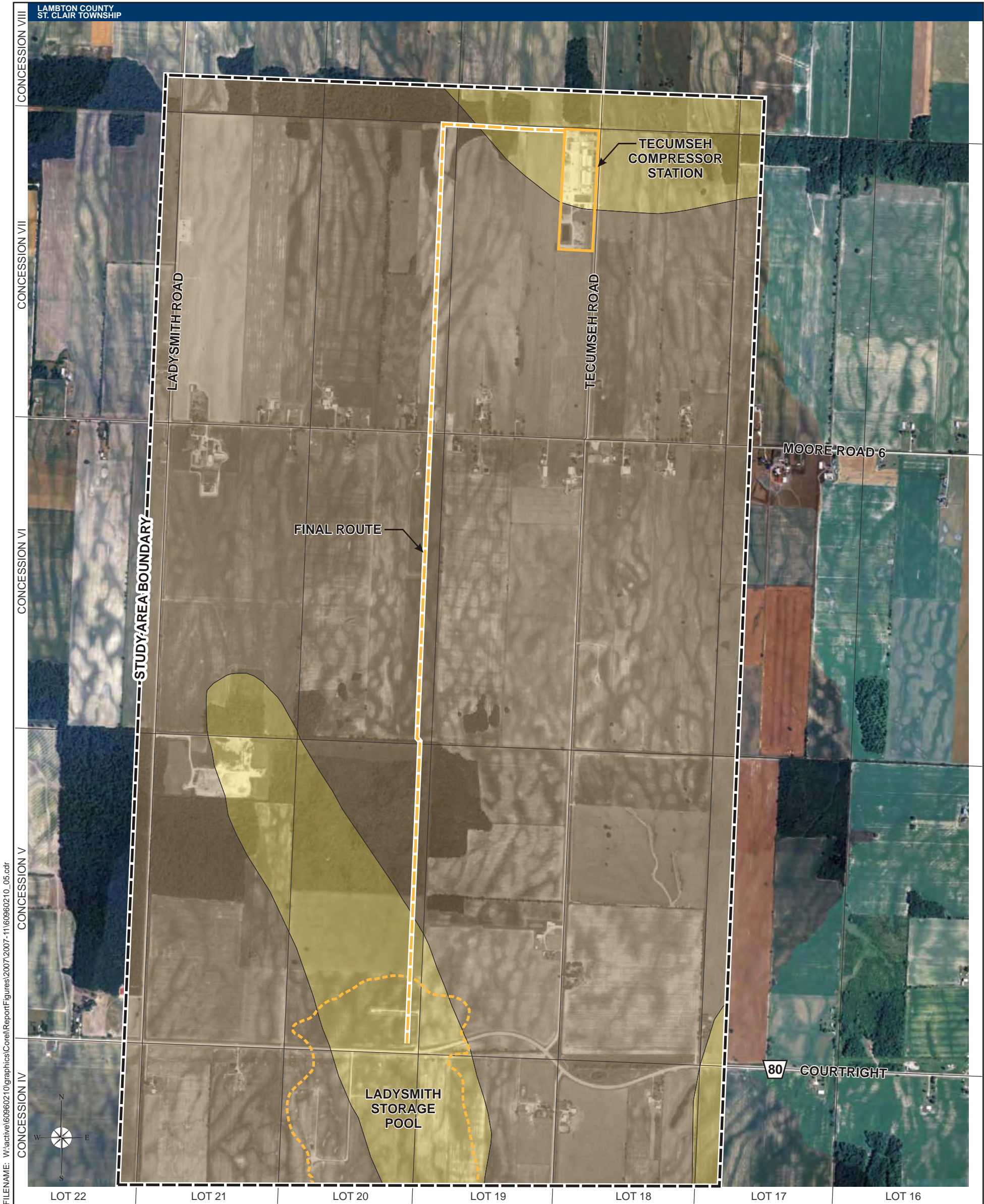
Appendix C

Environmental and Socio-Economic Setting

Appendix C1

Features Mapping





Base Map Source: Monteith and Southerland, 2002, Original Scale 1:6,100.
Soil & CLI Source: Ontario Ministry of Agriculture and Food and Rural Affairs, 2006.

Metres 0 165 330
Scale 1:16,500

SOIL TYPE CANADA LAND INVENTORY (CLI)

Brookston Clay CLASS 2

Caistor Clay CLASS 3

PROJECT NAME:
LADYSMITH

CLIENT NAME: **ENBRIDGE**

DATE INITIATED: **JULY, 2006** FILENAME: **60960210_05.cdr**

FIGURE NO. **C1-2**

SOIL TYPES AND CANADA LAND INVENTORY

PROJECT NO.:
160960210

| | | | | |
|----------|-----------|-------------|-----------|-----------|
| REV. NO. | SHEET NO. | CHECKED BY: | APPROVED: | DRAWN BY: |
| 0 | 1 OF 1 | MA | DPW | AM |





Base Map Source: Monteith and Southerland, 2002, Original Scale 1:6,100.
Sources: OMAFRA, 1997, St. Clair Region Conservation Authority, 2003, Landowner Correspondance, 2007.

Metres 0 165 330
Scale 1:16,500

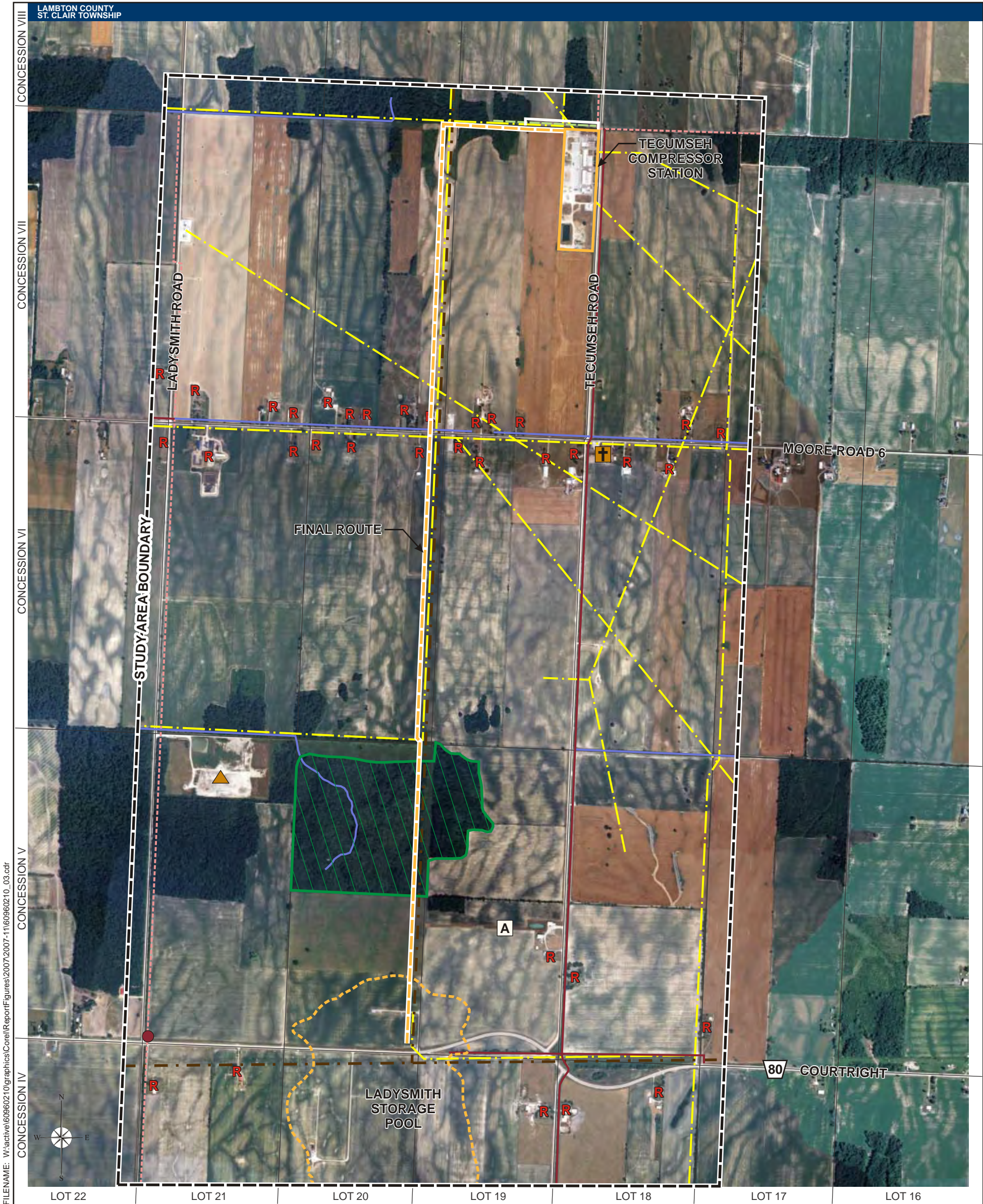
- Municipal Drainage System
- Artificial Drainage Systems
 - Random Drainage
 - Systematic Drainage

| | | | |
|-----------------|--|-----------------|------|
| PROJECT NAME: | | | |
| LADYSMITH | | | |
| CLIENT NAME: | | | |
| ENBRIDGE | | | |
| DATE INITIATED: | | FILENAME: | |
| JULY, 2006 | | 60960210_04.cdr | |
| FIGURE NO. | | | C1-3 |

DRAINAGE
FEATURES



| | | | |
|-------------|-----------|-------------|-----------|
| PROJECT NO: | | | |
| 160960210 | | | |
| REV. NO. | SHEET NO. | CHECKED BY: | APPROVED: |
| 0 | 1 OF 1 | MA | DPW |
| | | | DRAWN BY: |
| | | | CEW |



| | |
|-----------------|-----------------|
| PROJECT NAME: | |
| LADYSMITH | |
| CLIENT NAME: | |
| ENBRIDGE | |
| DATE INITIATED: | FILENAME: |
| JULY, 2006 | 60960210_03.cdr |
| FIGURE NO. C1-4 | |

SOCIO-ECONOMIC AND NATURAL FEATURES

| | | | |
|-------------|-----------|-------------|-----------|
| PROJECT NO: | | | |
| 160960210 | | | |
| REV. NO. | SHEET NO. | CHECKED BY: | APPROVED: |
| 0 | 1 OF 1 | MA | DPW |
| | | DRAWN BY: | CEW |

Appendix C2

Environmental and Socio-Economic Setting Text



**APPENDIX C2 – TECUMSEH
COMPRESSOR STATION TO
LADSYMITH NATURAL GAS
STORAGE POOL PROJECT ~
ENVIRONMENTAL AND SOCIO-
ECONOMIC SETTING TEXT**

File No. 160960210

Prepared by:

Stantec Consulting Ltd.
361 Southgate Drive
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May 2007

APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE POOL PROJECT ~ ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING TEXT

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Attachment 1 Common Avian Species

1.0 Physical Features

1.1 PHYSIOGRAPHIC CHARACTERISTICS AND RESOURCES

1.1.1 Physiography and Surficial Geology

The Study Area lies within the St. Clair Clay Plain physiographic region identified by Chapman and Putman (1984). The clay plain is an area of little relief. Only tributary stream channels break the generally flat topography. Elevations on the plain range from approximately 193 m to 205 m above sea level (asl). Overall relief slopes downward towards the southwest.

The level topography is a function of the glaciolacustrine history of the area, the underlying till plain having been smoothed out by the deposition of lacustrine clays in glacial Lake Whittlesey and Lake Warren. Exposed knolls were smoothed by wave action. The flat topography and clay overburden are responsible for the poorly drained nature of the area.

Based on the data provided by water well records (MOE, 2005), the overburden profile is composed primarily of approximately 1m of loam, 4 m to 7 m of yellow clay or occasionally red or regular clay, and 16 m to 36 m of blue clay overlying black shale. Depth to bedrock is approximately 41 m (MOE, 2005). Many of the borehole records also reveal the presence of a thin layer of sand or gravel overlying the bedrock. The sand or gravel layer seldom exceeds 1 m in thickness.

1.1.2 Bedrock

The entire Study Area is underlain by bedrock from the Kettle Point formation of the Devonian age. The bedrock consists of grey sublithic limestone and minor dolostone formations (Ontario Geological Survey, 2006).

The study area contains no outcroppings of bedrock and the general depth to bedrock, as indicated in the water well records (MOE, 2005), is approximately 41 m.

1.1.3 Mineral/Aggregate/Petroleum Resources

At the time that this report was written, the Ontario Geological Survey had not completed an Aggregate Resource Inventory Paper for the area. However, the aggregate potential of the Study Area is considered low to very low. There are limited deposits found in the Study Area and they are generally of low quality.

A significant portion of the Province's natural gas and oil is produced in Lambton and Middlesex counties. The reserves are scattered throughout the area in small pools in the subsurface strata. There are three storage pools in the Study Area. The Kimball-Colinville Pool storage reservoir, located in Lots 17, 18, 19, and 20, Concessions V, VI, VII, and VIII in the Township of St. Clair,

APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE POOL PROJECT ~ ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING TEXT

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and operated by Enbridge. The Payne Pool is located Lots 21 and 22, Concessions VI, VII, and VIII, in the Township of St. Clair, and operated by Union Gas Ltd. The Ladysmith Pool is located in Lots 19 and 20, Concessions V and IV, in the Township of St. Clair, and is operated by Enbridge. These storage reservoirs are in a group of many former gas pools in County of Lambton that are now used to store natural gas during low-demand “off=peak” seasons. These pools supply stored gas during periods of peak demand in the late fall and winter seasons. Natural gas storage reservoirs in the area are located in formations at depths that exceed 600 m. The locations of the pools within the Study Area are illustrated on **Figure C1-1, Appendix C1**.

Data from Natural Resources Canada (2004) indicates that there are no major producers of base metals, coal, ferrous, or precious metals in the Study Area. There are also no exploration projects for these resources in the Study Area (Natural Resources Canada, 2004), most likely due the lack of major geologic formations and glacial action.

1.1.4 Surficial Deposits

Soils within the Study Area are a reflection of their geology and physiography. The Study Area is part of the Lambton County Clay Plain as classified by Chapman and Putnam (1984). Soils are glaciolacustrine clays over till with relatively poor drainage. The relatively poor drainage is a result of the soil texture combined with gently sloping lands of the area. Two soil types are found within the Study Area, as identified in the Lambton County Soil Survey (Matthews, *et al.*, 1957). These are Brookston Clay, and Caistor Clay with Brookston Clay being found over the majority of the Study Area. The characteristics of these soil types are summarized in **Table 1-1**.

Table 1-1 Soil Characteristics and Agricultural Capability

| Symbol | Soil Series Name | Surface Texture | Soils Materials/ Drainage | Capability Class |
|--------|------------------|-----------------|---|------------------|
| Bc | Brookston | Clay | Clayey till, high in lime/ Poor | 2 |
| Cc | Caistor | Clay | Shaley medium lime clay till/ Imperfect | 3 |

Brookston Clay

Brookston Clay is the poorly drained member of the Huron Catena. A catena is a grouping of soils consisting of similar parent material, but differing in drainage characteristics. Approximately 14% of the Study Area consists of Brookston Clay. This soil type has developed on level to slightly sloping terrain that exhibits poor drainage characteristics, both internally and externally. A typical profile of Brookston Clay contains the following composition over the various soil horizons:

A₀ horizon consists of partially decomposed remains from deciduous trees;

A₁ horizon contains approximately 20.3 cm of very dark brown clay that is high in organic content with an average pH of 6.7;

B horizon contains approximately 20.3 cm to 51 cm of light brownish gray clay with some yellow-brown mottling and a pH average of 7.0 to 7.2; and,

C horizon contains calcareous clay till and some Huron shale fragments and has an average pH level of 7.8.

Brookston Clay soils are generally high in organic content and erosion is not a problem due to the level topography of the Study Area.

Caistor Clay

Approximately 86% of the Study Area consists of Caistor Clay soils. This soil belongs to the Grey-Brown Podzolic Great Soil Group and occurs on slightly undulating topography. Caistor clay exhibits hindered internal drainage characteristics due to compact subsoil. External drainage is imperfect as a result of numerous saucer like depressions occurring on the surface of the soil.

The Caistor Clay soil profile typically includes:

A₀ horizon 0 cm to 1.3 cm of partially decomposed litter from deciduous trees;

A₁ horizon approximately 0 cm to 7.6 cm of dark gray clay loam with a pH of 6.2;

A₂ horizon at 7.6 cm to 15.2 cm is comprised of light gray clay, slightly mottled with yellow-brown and a pH of 5.7;

B₁ horizon has 15.2 cm to 23 cm of yellow brown clay; somewhat mottled with a pH of 5.8;

B₂ horizon of 23 cm to 51 cm of brown clay mottled with yellow-brown clay and a pH of 6.4; and,

C horizon contains light gray-brown clay till high in lime with some Huron shale and a pH of 7.6.

The B₂ horizon tends to be fine textured and very compact therefore limiting water infiltration and root development. The soil is moderately acidic and is naturally low in organic content. Caistor Clay soils are best utilized for livestock farming, legume crops (which improve aeration and drainage) and rotations that include some row crops.

Figure C1-2, Appendix C-1 shows the type and location of soils within the Study Area.

1.2 SEISMICITY

The probability of seismic activity (i.e. earthquakes) in the Study Area is very low. Seismic activity and risk is recorded and estimated by Natural Resources Canada. Zone maps describe relative risk on a scale of 0 to 6. The probability of exceeding a certain acceleration (Z_a) and velocity (Z_v) by ten percent over 50 years is also described.

The Study Area is located in risk zone 1 for both ground acceleration and ground velocity. The probability of exceeding 0 to 0.08 times the force of gravity during horizontal ground acceleration is ten percent in fifty years (Natural Resources Canada, 2005a). The probability of exceeding 0 to 0.08 metres per second horizontal ground velocity is also ten percent in 50 years (Natural Resources Canada, 2005b).

1.3 CLIMATE

The Study Area is located within the Lake Erie Counties Climate Region (Brown et al., 1968). This region is moderated by the presence of Lake Huron to the north, Lake Erie to the south, and Lake St. Clair to the west. It is characterized by warm and humid summers with moderate to high rainfall. Mean daily temperatures remain above 0 degrees Celsius from April to November resulting in a relatively lengthy growing season. Annually, the mean precipitation is 85 cm. On average there are 150 frost-free days in a year. In the Lake Erie Counties Climatic Region, the moderating effect of the lakes results in a mild winter with a low net accumulation of snow.

No Environment Canada climatic/precipitation stations exist within the Study Area. However, a nearby station is found adjacent to the Study Area in the City of Sarnia. The City of Sarnia is located approximately 20 km northwest of the Study Area.

City of Sarnia

The average daily temperature for the City of Sarnia is 8.1°C; temperatures reach their lowest point in January (-5.4°C) and their warmest in July (20.9°C). On average, the total precipitation for any given year is 732.6 mm; the wettest month being September (94.0 mm) and the driest being February (47.7 mm). Sarnia also experiences approximately 147.1 days of precipitation per year. The extreme maximum temperature for the City of Sarnia was recorded in June (39.1°C) and the extreme minimum temperature was recorded in January (-28.9°C) (Environment Canada, 2004).

1.4 HYDROLOGY

1.4.1 Surficial Hydrology

The Study Area is primarily characterized by poorly drained clay soils and flat topography. There are no natural watercourses within the Study Area. Several municipal drains surrounding, and located within the Study Area are the only means for removal of standing water from the land. The Jarvis Drain and the Coyle Drain accept the greatest volumes of runoff in the Study Area. Both drains are oriented in a north/south direction through the Study Area. The locations of all municipal drains are shown in **Figure C1-3, Appendix C1**.

The Lloyd Smith Drain, the Eyre Drain, the Taggart Drain, and the MacDonald Drain provide drainage for the eastern portion of the Study Area. Each of these drains flow west from the eastern Study Area boundary into Jarvis Drain.

The Cameron Drain and the Arnold Drain provide drainage for the northwestern portion of the Study Area. These drains, as well as the Trapp Drain collect excess runoff from the western half of the Study Area and eventually flow west into the Coyle Drain.

Surface flow within fields generally occurs in an east to west direct. As a result, tile drain outlets are predominantly on the west side of fields to be consistent with surface flow. Cross county drains are usually combination drains; surface flow is collected in an open ditch which has tile drainage installed below.

The watercourses within the Study Area fall under the jurisdiction of the St. Clair Region Conservation Authority (SCRCA). The SCRCA manages the watersheds and natural habitat for the majority of County of Lambton. Data collected from the SCRCA displays the location and classification of municipal drains within the Study Area (See **Figure C1-4, Appendix C1**).

1.4.2 Groundwater

Water well records obtained from the MOE (2005) indicate that approximately 35 wells have been drilled in the Study Area. Groundwater is generally found at depths ranging from 30 m to 62 m, within the fractured upper layers of bedrock. Thin localized gravel and sand pockets also act as a discontinuous conduit for groundwater (MOE, 1988). Static water levels are variable but usually range between 3 m to 15 m.

The well water supply is predominantly fresh and potable. However, well water in the area is generally very hard. Elevated levels of iron, chlorides, and sulphates are common problems. Well water quality is summarized in **Table 1-2**.

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Physical Features

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Table 1-2 Well Water Quality

| Water Quality | Mineral | Fresh | Sulphur | Dry | Salt | Unknown/Not Recorded |
|----------------------|----------------|--------------|----------------|------------|-------------|---------------------------------|
| Number of Wells | 0 | 22 | 0 | 4 | 0 | 9 |

(Source: MOE, 2005).

Susceptibility of groundwater to contamination in the area is generally low (MOE, 1980). The deep bedrock-overburden aquifer is protected from surface contamination by a thick layer of finely textured clay materials that has a low permeability and a high capacity for attenuation of contaminants. The low relief and low permeability of the overburden prevent contaminants from moving in the groundwater to deeper depths.

2.0 Agricultural Features

Information about agricultural features in the Study Area is derived from the Canada Land Inventory Capability for Agriculture for Southern Ontario, and data from the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA).

2.1 CANADA LAND INVENTORY CAPABILITY FOR AGRICULTURE

The Canada Land Inventory (CLI) categorizes land into seven classes and thirteen subclasses. These designations reflect the soil's potential to produce field and forage crops. Lands classified as Class 1 are considered the most productive, while those classified as Class 7 are considered the least productive. Class 1 to 4 agricultural lands are generally considered capable of being farmed productively while lands with Class 1, 2 and 3 designations are considered prime for general field crop production. The classification system reflects limitations such as slope, shallow soils, climate, drainage, and fertility among others. Organic soils are not rated in the classification system.

Approximately 86% of the Study Area consists of Class 3 soils with moderately severe limitations that restrict the range of crops or require special conservation practices. The Class 3 soils are Caistor clay. The limitations on these soils seriously affect one or more of the following: the timing and ease of tillage, planting and harvesting, choice of crops, and methods of conservation.

Class 2 soils comprise approximately 14% of the Study Area. Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices. These soils are generally deep and are able to hold moisture well. Under proper management, soils in this class are moderately high to high in productivity for a fairly wide range of crops. In the Study Area, the Class 2 soils are Brookston clay and generally require systematic drainage systems to reach their full agricultural potential. Where artificial drainage has not been installed, crops are generally limited to hay, pasture, and some cereal grains. On lands that have been improved with artificial drainage systems the crop productivity is increased. Typical crops grown on improved lands include winter wheat, cereal grains, alfalfa, corn, and soybeans.

CLI categorization of lands within the Study Area is shown on **Figure C1-2, Appendix C1**.

2.2 ARTIFICIAL DRAINAGE

Artificial drainage in Ontario is mapped and categorized by OMAFRA into two general types: random and systematic. Random tile drains are used to dry isolated wet areas of a field and have no uniform order or direction. Random drainage is installed to improve the productivity of specific poorly drained areas within an agricultural field. Systematic drains are installed to improve the agricultural productivity of an entire field.

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Most of the agricultural land within the Study Area has been improved with artificial drainage systems. Approximately 84% of the Study Area has artificial drainage systems installed; approximately 26% is systematically drained, and an additional 58% has random drainage. Lands in the Study Area that are not tile drained are rural residential lots, wooded areas or form part of the Moore Landfill. **Figure C1-3, Appendix C1** illustrates the location and type of artificially drained lands within the Study Area.

3.0 Biophysical Features

3.1 WATERCOURSES AND FISHERIES

Electrofishing was utilized at one site within the Study Area to determine the fish species, if any, which exist in the Study Area (**Figure C1-4, Appendix C1**). There were two species present in the Coyle Drain, the central mudminnow and the green sunfish. Both of these species are common in the area.

The central mudminnow (*Umbra limi*) is an exotic species that has a geographic range from Saskatchewan to Quebec and as far south as Arkansas. It grows to a length of 12 cm and is a member of the same family as pike. It is usually found in moderately to densely vegetated streams, sloughs, or swamps and avoids areas where the water is more than 0.5 m deep. It is tolerant of low oxygen and high temperature conditions. It is a bottom feeder that eats mainly midges, crustaceans, and mollusks (NatureServe, 2006).

The green sunfish (*Lepomis cyanellus*) is a native species in Ontario and throughout the central and eastern U.S. and is ranked S4, or apparently secure in Ontario. It grows to a length of 25 cm and prefers sluggish, warm streams, ponds, and shallow weedy margins of lakes. It is usually found in the vicinity of weed beds and is tolerant of both clear and turbid water. It feeds opportunistically on the larger, more active invertebrate that occur with them, and on small fishes (NatureServe, 2006).

3.2 FORESTRY

The Study Area is located within the Eastern Deciduous Forest Region of Canada, which includes the Carolinian Zone of Canada (Hosie, 1975). Ontario's Eastern Deciduous Forest lies along the northern shores of lakes Erie and Ontario and the southeastern shore of Lake Huron. It is the northern extension of the large deciduous forest of the northeastern United States. Many of the trees found there are at the northern limit of their range (i.e. not found elsewhere in Canada). Carolinian species include the tulip tree (*Liriodendron tulipifera*), cucumber-tree (*Magnolia acuminata*), pawpaw (*Asimina triloba*), black walnut (*Juglans nigra*), and sassafras (*Sassafras albidum*).

The deciduous forest region contains one percent of Ontario's forests. In this region, the forest life is the most diverse in Ontario. A number of nationally rare species of mammals, birds, plants and insects can be found there. Some examples are the sassafras, tulip tree, and the southern flying squirrel (MNR, 2002a).

**APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE
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The warm and dry climate of southwestern Ontario allows ecosystems, typical of southern climates, to support these Carolinian species. The Deciduous Forest Region of Canada therefore supports more uncommon or rare species than any other life zone within Canada. These species are considered common within the United States however; their limited occurrence in Canada has resulted in the uncommon and/or rare status. MNR has not documented any Carolinian sites within the Study Area (MNR, undated).

Extensive clearing for agriculture in the Study Area has removed much of the native forest cover and the scattered, residual forest areas are variable in size, but generally small. Many of the stands occupy sites that are imperfectly to poorly drained due to the relatively flat topography and heavy clay soil typical of the area. These conditions have limited the agriculture uses and thereby facilitated retention of these fragmented forest stands.

Within the Township of St. Clair active recreation, conservation, existing agriculture and passive recreation are the only permitted uses of the environmental protection – woodlot zone (EP-WD). The Township of St. Clair Comprehensive Zoning By-Law (County of Lambton, 2003) also states that “No trees may be cleared within the EP-WD without being in accordance with accepted woodlot management practices and tree savings plan and the County of Lambton Tree Cutting By-Law.”

The forest stands have been logged at various times and several are pastured. Many of these stands exhibit a variable age structure with some older residual trees scattered among a predominantly immature/submature canopy. Understory regeneration is typically dense except in pastured sites. Some of the woodlots have also been disturbed in the past by utility corridors. The disturbed edges contain pioneering species such as trembling aspen, largetooth aspen, elm, hawthorn, shrub regeneration, and hardwood saplings.

Scattered homestead and roadside plantings, as well as field hedgerows are present in the Study Area. Typical species in the homestead and roadside plantings are spruce (Norway, white), white cedar, silver maple, cottonwood, bur oak and shagbark hickory. Many of the roadside trees exhibit poor health due to stresses including dust, past grading, ditching, salt, and general senescence.

3.2.1 Wetlands

The MNR and Environment Canada (1984) classifies wetlands into two categories: provincially and non-provincially significant. Provincially significant wetlands are comprised of wetlands identified by the MNR, under the previous classification system, as Classes 1 through 3. Non-provincially significant wetlands are wetlands identified as Classes 4 through 7 using the same classification system. The class is obtained for a wetland based on four different categories, including Biological, Social, Hydrological, and Special Features. Development is not permitted within provincially significant wetlands, however, development does not include activities that create or maintain infrastructure authorized under an environmental assessment process. There are no provincially or non-provincially significant wetlands within the Study Area.

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3.3 WILDLIFE

Wildlife habitat in the Study Area reflects the agricultural history of extensive woodland removal and fragmentation. Habitat is limited generally to the scattered woodlots and the minor riparian watercourse and hedgerow system.

Table 3.1 lists species that are found in the vicinity of the Study Area. Common wildlife species were determined through the use of the *Atlas of the Mammals of Ontario* and the *Ontario Herpetofaunal Summary Atlas* (Dobbyn, 1994; MNR, 2002b).

These species are common to Southern Ontario and typical of the habitat setting. There are no deer yards, Wildlife Management Areas, hunting preserves, Crown game preserves, waterfowl habitat, heronries or Special Wildlife features identified in the Study Area (MNR, undated).

Table 3-1 Common Species Found in the Vicinity of the Study Area¹

| Common Name | Scientific Name |
|---|-----------------------------------|
| Bats | |
| Big Brown Bat | <i>Eptesicus fuscus</i> |
| Eastern Red Bat | <i>Lasiurus borealis</i> |
| Hoary Bat | <i>Lasiurus cinereus</i> |
| Carnivores | |
| Coyote | <i>Canis latrans</i> |
| Red Fox | <i>Vulpes vulpes</i> |
| Raccoon | <i>Procyon lotor</i> |
| Mink | <i>Mustela vison</i> |
| Striped Skunk | <i>Mephitis mephitis</i> |
| Deer | |
| White-tailed Deer | <i>Odocoileus virginianus</i> |
| Opossum | |
| Virginia Opossum | <i>Didelphis virginiana</i> |
| Rabbits and Hares | |
| Eastern Cottontail | <i>Sylvilagus floridanus</i> |
| European Hare | <i>Lepus europaeus</i> |
| Rodents | |
| Eastern Chipmunk | <i>Tamias striatus</i> |
| Woodchuck | <i>Marmota monax</i> |
| Grey Squirrel and Grey and Black Phases | <i>Sciurus carolinensis</i> |
| Red Squirrel | <i>Tamiasciurus hudsonicus</i> |
| White-footed Mouse | <i>Peromyscus leucopus</i> |
| Deer Mouse | <i>Peromyscus maniculatus</i> |
| Meadow Vole | <i>Microtus pennsylvanicus</i> |
| Muskrat | <i>Ondatra zibethicus</i> |
| Norway Rat | <i>Rattus norvegicus</i> |
| House Mouse | <i>Mus musculus</i> |
| Frogs and Toads | |
| Eastern American Toad | <i>Bufo americanus americanus</i> |
| Northern Spring Peeper | <i>Pseudacris crucifer</i> |
| Western Chrous Frog | <i>Pseudacris triseriata</i> |

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Table 3-1 Common Species Found in the Vicinity of the Study Area¹

| Common Name | Scientific Name |
|-------------------------|-------------------------------------|
| Grey Treefrog | <i>Hyla versicolor</i> |
| Wood Frog | <i>Rana sylvatica</i> |
| Northern Leopard Frog | <i>Rana pipiens</i> |
| Green Frog | <i>Rana clamitans melanota</i> |
| Bullfrog | <i>Rana catesbeiana</i> |
| Turtles | |
| Common Snapping Turtle | <i>Chelydra serpentina</i> |
| Midland Painted Turtle | <i>Chrysemys picta marginata</i> |
| Eastern Spiny Softshell | <i>Apalone spinifera spinifera</i> |
| Snakes | |
| Eastern Garter Snake | <i>Thamnophis sirtalis sirtalis</i> |
| Butler's Garter Snake | <i>Thamnophis butleri</i> |
| Brown Snake | <i>Storeria dekayi</i> |
| Smooth Green Snake | <i>Liophis vernalis</i> |

¹Source: Dobbryn, 1994; MNR, 2002b.

Bird species that were commonly recorded within the Study Area included mourning dove, American kestrel, American crow, song sparrow, black-capped chickadee, red-winged blackbird, and European starling (Ontario Breeding Bird Atlas, 2001-2005). For a full list of birds common to the Study Area, please see **Attachment 1**. Due to the relatively small size of the fragmented woodlots and the agricultural setting within the Study Area, the avifauna is likely dominated by edge species that are relatively tolerant of some disturbance. Species requiring larger and more continuous forest tracks (forest interior and area sensitive species) will tend to concentrate in the more extensive forests, ESA areas, and river valleys, that are not common to the Study Area.

3.3.1 Rare, Threatened, or Endangered Species

Rare and at-risk species may be determined at national, provincial, and municipal levels. Species that have been determined to be of special concern by the federal government are rare or threatened throughout Canada. Provincial species of special concern are rare or threatened in Ontario. The Government of Canada ranks species as endangered, threatened, or special concern. The provincial government ranks species by rarity, from extremely rare to common. A review of the National Species at Risk (Environment Canada, 2006) and provincial Natural Heritage Information Centre databases (NHIC, 2005) identified 21 species of concern in the Study Area. Other species of local concern may also be present.

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Species of national special concern include:

Table 3-2 Species of National Concern¹

| Common Name | Scientific Name | Rank |
|--|---------------------------------|----------------------------|
| Carnivores | | |
| American Badger jacksoni subspecies | <i>Taxidea taxus jacksoni</i> | National – Endangered |
| Grey Fox | <i>Urocyon cinereoargenteus</i> | National – Threatened |
| Turtles | | |
| Northern Map Turtle | <i>Graptemys geographica</i> | National – Special Concern |
| Spiny Softshell | <i>Apalone spinifera</i> | National – Threatened |
| Spotted Turtle | <i>Clemmys guttata</i> | National – Endangered |
| Snakes | | |
| Butler's Gartersnake | <i>Thamnophis butleri</i> | National – Threatened |
| Eastern Foxsnake | <i>Elaphe gloydi</i> | National – Threatened |
| Birds | | |
| Acadian Flycatcher | <i>Empidonax virens</i> | National – Endangered |
| Cerulean Warbler | <i>Dendroica cerulea</i> | National – Special Concern |
| Henslow's Sparrow | <i>Ammodramus henslowii</i> | National – Endangered |
| Hooded Warbler | <i>Wilsonia citrine</i> | National – Threatened |
| Least Bittern | <i>Ixobrychus exilis</i> | National – Threatened |
| Northern Bobwhite | <i>Colinus virginianus</i> | National – Endangered |
| Yellow-breasted Chat virens subspecies | <i>Icteria virens virens</i> | National – Special Concern |
| Plants | | |
| Butternut | <i>Juglans cinerea</i> | National – Endangered |
| Kentucky Coffee-Tree | <i>Gymnocladus dioica</i> | National – Threatened |
| Butterfly | | |
| Monarch | <i>Danaus plexippus</i> | National – Special Concern |

¹ Source: Environment Canada, 2006.

There are no species in the Study Area that are extremely rare and very rare in Ontario (NHIC, 2005).

3.4 NATURAL HERITAGE AND ENVIRONMENTALLY SENSITIVE AREAS

County of Lambton has a wealth of significant environmental features representing rare ecosystems, unique species of plants and animals and sites valued by County residents for their physical beauty.

The County has an interest in maintaining and enhancing, where possible, these features and connections through the use of corridors for the “health” of the natural environment. Indicators of health are the variety of species (biodiversity) found within the various natural communities in the County and their ability to handle stresses (resilience) that are imposed on them.

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The Natural Heritage System is a combination of significant natural areas, their functions, and the corridors that connect them. Based on County of Lambton's Natural Heritage System there are no areas within the Study Area that have been identified as significant natural areas. This includes previous designations by County of Lambton for ESAs, provincial designations of ANSIs, or locations suitable for providing vulnerable, threatened or endangered.

The Township of St. Clair Comprehensive Zoning By-Law (County of Lambton, 2003) identifies two Environmental Protection – Woodlot areas within the Study Area. Discussions with the County of Lambton staff confirmed that these woodlots are considered significant by the County of Lambton (County of Lambton, 2007)

4.0 Socio-Economic Features

The Study Area is located in the Township of St. Clair, which is located within the County of Lambton. During the data collection and mapping stages, socio-economic features within the study area were identified and described. Information was obtained from various sources, including:

- Statistics Canada's 2001 census;
- The Corporation of the County of Lambton website;
- St. Clair Region Conservation Authority;
- Oil, Gas and Salt Resources Library;
- Chemical Valley Emergency Coordinating Organization;
- MOE;
- OMAFRA;
- Ministry of Culture;
- Enbridge Gas Distribution Inc.; and,
- Union Gas.

The description of socio-economic features in the study area provides a regional profile of both general and specific characteristics of the Township of St. Clair, in the County of Lambton. The purpose of the profile is to narrow and focus the analysis on the socio-economic features that may be affected due to construction and operation of the proposed natural gas pipeline. Features figures are located in **Appendix C1**. Hydrologic and geologic features are shown in **Figure C1-1**, soil and CLI information is shown in **Figure C1-2**, drainage information is shown in **Figure C1-3**, and socio-economic and natural features are shown in **Figure C1-4**.

4.1 MUNICIPAL STRUCTURE

The study area is contained solely in the Township of St. Clair, in County of Lambton. This township is a result of the recent amalgamation of the Townships of Moore and Sombra. There are no cities, towns, villages, or hamlets within the Study Area. There are no areas of organized recreational activities in the Study Area. The main land use in the area is agriculture.

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4.2 POPULATION

There are no towns or cities within the Study Area. The predominant land use throughout the Study Area and vicinity is agriculture as described in **Section 4.5.3**.

Identifying population characteristics within the study area allows certain observations to be made about community characteristics. A common concern that may be incorporated into the evaluation criteria is the separation distance of pipelines from residential and institutional units.

Both the County of Lambton and the Township of St. Clair have experienced a decline in population between the census years of 1996 and 2001, even though the province of Ontario has increased in population during this five year period, as seen in **Table 4.1**. This is likely due to a general decline in agricultural industries, the main industry in County of Lambton, and a shift in population towards larger, urban centres.

Table 4.1 Population Profile

| Item | 1996 | 2001 | Change (%) |
|-----------------------|------------|------------|------------|
| Township of St. Clair | 15,081 | 14,659 | -2.8 |
| County of Lambton | 128,975 | 126,971 | -1.6 |
| Province of Ontario | 10,753,573 | 11,410,046 | 6.1 |

Source: Statistics Canada, 2001

4.3 INSTITUTIONAL CHARACTERISTICS

As an important part of the socio-economic characteristics of an area, institutional facilities (e.g. churches and community centers) are typically supported by community investment and volunteer support. Institutional facilities are often widely used by the community and thus, potential disruption of these facilities may have an impact on the community.

The Sixth Line United Church is located on the corner of Moore Line and Ladysmith Road, no other institutional facilities exist in the Study Area.

4.4 CULTURE AND TOURISM

There are no major tourist attractions in the Study Area. However, within the County of Lambton there are many places of interest. The Oil Museum of Canada is located in Oil Springs, which is northeast of the Study Area. The Petrolia Discovery in Petrolia displays the history of the petroleum industry in the County of Lambton.

There are no provincial parks or conservation areas within the Study Area, however there are several in the vicinity of the Study Area.

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Provincial Parks

Located on the eastern shore of Lake Huron, at Stoney Point just east of Kettle Point, Ipperwash Provincial Park features shore dune complexes that were formed by wind and wave action. Unique communities exist here, such as a dune successional complex, a creek/dune lowland association, wet meadows and a sub-climax deciduous forest community.

Located just north of Ipperwash Provincial Park, Pinery Provincial Park features open oak savannahs and oak-pine woodlands, which are one of the most significant areas of prairie species in the Southern Ontario, ranking only behind Walpole Island and Windsor. In terms of extensive areas of native vegetation, Pinery is unequalled.

Conservation Areas

The St. Clair Region Conservation Authority owns or operates 15 Conservation Areas and 6 Habitat Management Areas. Facilities range from serviced campgrounds with a wide variety of attractions to natural areas with little or no facilities. Our Conservation Areas include wetlands, forests and urban parks, which feature 38 km of trails. Two Conservation Areas are located along Lake Huron and provide access to beautiful beaches. The closest Conservation Areas to the study area are the Wawanosh Wetlands Conservation Area and the Lorne C. Henderson Conservation Area.

The Wawanosh Wetlands Conservation Area is just 10 minutes south of Lake Huron, east of Sarnia. A nature trail winds along a provincially significant marsh where bird watching and other outdoor activities can be enjoyed.

The Lorne C. Henderson Conservation Area is located 5 minutes west of Petrolia. There are 5 kms of nature trails that wind through a variety of habitats, including grasslands, floodplains, upland forests and along wildlife ponds. There are also campsites, both serviced and not serviced and a swimming pool for further recreational enjoyment.

4.5 ECONOMY AND EMPLOYMENT**4.5.1 Economy**

Agriculture is the dominant land use within both the County of Lambton, and the study area itself, with most of the lands having been cleared of natural vegetation to facilitate agricultural and other related uses and services. **Table 4.2** provides an agricultural profile of the County of Lambton, comparing the agricultural land area, number of farms, and lands in crop production to the total land area of the county.

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Table 4.2: Agricultural Profile

| Item | Total Area of Farms (Ha) | Area Owned (Ha) | Area Rented or Crop Shared (Ha) | Area in Cropland (Ha) |
|---------------------|--------------------------|-----------------|---------------------------------|-----------------------|
| Lambton County | 244,655 | 174,365 | 70,290 | 208,983 |
| Ontario | 5,466,233 | 3,793,191 | 1,673,043 | 3,656,705 |
| Percent of Province | 4.48 | 4.6 | 4.2 | 5.72 |

Source: Statistics Canada, 2002

According to the Soil Survey for Lambton County, the total area of the County of Lambton is 291,115 Ha. Therefore 84% of the total land area of the County of Lambton is utilized for farming. Significant portions of these lands are used for various types of crop production (e.g. soybeans and corn). In the County of Lambton, approximately 72% of the land is used for crop production.

Another important agricultural land use within the County of Lambton is livestock production. Most of the farming operations related to livestock production involve swine, however, cattle and calves, and poultry also represent important livestock operations. **Table 4.3** provides a profile of the number of farms involved in each of these predominant livestock operations.

Table 4.3: Livestock Profile

| Item | Total Cattle and Calves (#) | Total Swine (#) | Total Poultry (#) |
|---------------------|-----------------------------|-----------------|-------------------|
| Lambton County | 48,437 | 249,877 | 1,435,708 |
| Ontario | 2,140,731 | 3,457,346 | 47,027,393 |
| Percent of Province | 2.26 | 7.23 | 3.05 |

Source: Statistics Canada, 2002

In order to maintain the agricultural productivity of soils for crop and livestock production, artificial tile drainage is used extensively throughout the study area. Please see **Figure C1-3, Appendix C1** for further information on the artificial drainage systems in the study area.

Agricultural businesses (agri-businesses) are major economic contributors to the financial health of individuals and communities within the study area. Each farm, whether individually or corporately owned, must sell its livestock, crops, and other related products within fluctuating markets (e.g. local and international). Extended periods of wet or dry conditions can have serious economic impacts on the market and in turn the profitability of agri-business. **Table 4.4** shows the total number of farms in relation to total gross farm receipts.

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Table 4.4: Total Gross Farm Receipts, 2001

| Item | Under \$2,500 | \$25,00 to \$4,999 | \$5,000 to \$9,999 | \$10,000 to \$24,999 | \$25,000 to \$49,999 | \$50,000 to \$99,999 | \$100,000 to \$249,999 | \$250,000 to \$499,999 | \$500,000 and over |
|---------------------|------------------|-----------------------|-----------------------|----------------------------|----------------------------|----------------------------|------------------------------|------------------------------|-----------------------|
| Lambton County | 81 | 66 | 205 | 460 | 476 | 356 | 466 | 186 | 131 |
| Ontario | 4,636 | 3,360 | 7,374 | 11,378 | 7,862 | 6,542 | 9,587 | 5,493 | 3,496 |
| Percent of Province | 1.75 | 1.96 | 2.78 | 4.04 | 6.05 | 5.44 | 4.86 | 3.39 | 3.75 |

Source: 2001 Census of Agriculture and Policy Analysis Branch, OMAFRA

In the County of Lambton, the largest numbers of farms fall between gross farm receipts of \$25,000 to \$49,999. This accounts for 6.05% of the provinces total.

Statistics Canada classifies agri-business under 'primary industries', which include agriculture, forestry and mining, in its evaluation of economic characteristics of a region. Since both forestry and mining are non-existent in the study area, agriculture constitutes the largest component of primary industries.

4.5.2 Employment

In terms of employment, the County of Lambton as a whole has an estimated population of 126,971 people with an unemployment rate of approximately 6.6% (Statistics Canada, 2001).

A study released in December 1999, identified annual revenues of over \$773 million related to agriculture. The sector is a significant contributor to the economy of the County of Lambton, although employs only 6.3% of the labour force.

Although it is best known for having the largest acreage of soybeans of any county in Ontario, the County of Lambton is also noted for its great variety of products. With many different soil types throughout the region, just about every type of farm produce is found from the cash crops of soybeans, corn, and wheat, to specialty crops such as tomatoes and tobacco and many varieties of fruits and vegetables. There is also a wide variety of livestock production, from beef and dairy cattle to poultry and eggs.

Approximately 19,200 people are employed in over 1,450 industrial-oriented firms and enterprises in the County of Lambton. The manufacturing sector is the largest employer, accounting for 17.5% of the total labour force. Within this sector, manufacturing of Petroleum and Coal Products employs approximately 23.8% of the labour force in the manufacturing sector (Sarnia-Lambton Office of Economic Development, 2000).

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4.5.3 LAND USE

The Township of St. Clair is bounded by the Townships of Enniskillen, and Dawn-Euphemia, the City of Sarnia, the Border between Canada and the United States, and the Municipality of Chatham-Kent. Land use in the Study Area is a mixture of rural residential (cluster and sporadic), agricultural, forest, and above and below grade natural gas facilities.

The responsibility for land-use planning in the Study Area is shared between the County of Lambton and the Township of St. Clair. The County of Lambton has a two-tier planning system in which planning responsibilities are divided between the County and the Township. The County of Lambton Official Plan came into effect in January 1998. The Official Plan for the Township of St. Clair came into effect in January, 2001.

The main permitted land-use in rural areas of St. Clair is agriculture, according to Part B, Section 1.0 of the Township of St. Clair Official Plan. However, other permitted uses include petroleum resources exploration and extraction facilities (County of Lambton, 2001).

The County of Lambton Official Plan Section 9.1, permits gas and petroleum drilling production storage; the development and use of buildings or structures to house pumping equipment and storage facilities for pumped material. Additional buildings or structures, or the placing of machinery used to process, refine, blend, or otherwise process petrochemicals are not permitted uses.

The County of Lambton Official Plan, Section 9.0 addresses pipelines and gas storage facilities and states:

“In Ontario, subsurface oil, gas and salt resources are regulated by the province and/or its delegate under the Oil, Gas and Salt Resources Act and by the Ontario Energy Board under the Ontario Energy Board Act. The County and local municipalities do not have the statutory authority to further regulate these matters. The County and local municipalities, should however, provide a policy direction for matters pertaining to surface and land uses. The oil and gas industry is urged to place a high value on the importance of protecting and enhancing the natural heritage resources, and features, as set out in the Official Plan” (County of Lambton, 1998).

With respect to the proposed undertaking, the proposed pipeline is subject to the Ontario Energy Board Act.

The St. Clair Official Plan also encourages the reforestation and conservation of woodlots. Existing woodlots will be protected in accordance with the County of Lambton Tree Protection By-law that regulates the cutting of certain trees and woodlots. The municipality may also consider implementing relevant sections of the Forestry Act, the Woodlands Improvement Act, the Municipal Act and any other relevant legislation.

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A review of existing information on local agriculture included review of the OMAF Agricultural Land Use Systems (1983) and Artificial Drainage Systems (1981) maps.

Land use within the Study Area is almost entirely agricultural. Continuous row crops of soybeans and wheat predominate with a significant hay/pasture and feed stock corn component.

4.6 FIRST NATIONS INTERESTS

The majority of the population in the County of Lambton is of British origin (41%), a significant decline from the 99% recorded in 1861. The major cultural groups in the County of Lambton are French, Italian and German, although approximately 89% of all residents speak English only.

Indian and Northern Affairs Canada (INAC), was contacted on June 21, 2006 to seek information regarding the status of lands within the Study Area. A letter notifying them of the March 21, 2007 Public Open House was sent on March 5, 2007.

INAC replied to Stantec's information request on June 29, 2007. The letter notified Stantec that no specific claims have been submitted in the Study Area. However, they can only speak directly to claims filed under the Specific Claims Policy for the Province of Ontario. They suggested that the Comprehensive Claims Branch or the Litigation Management and Resolution Branch be contacted to receive information in regards to claims under Canada's Comprehensive Claims Policy or legal action by First Nations against the Crown.

INAC's Comprehensive Claims Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. Stantec was notified that there are no claims within the area southeast of Sarnia, and therefore the Study Area.

INAC's Litigation Management and Resolution Branch was contacted on April 12, 2007 to inquire about any First Nations claims within the Study Area. A map showing the Study Area was emailed to aid in the information request. A response was received on April 30, 2007 stating that there were active litigation cases in the vicinity of the Study Area. INAC stated that they could not comment with respect to the possible effect of these claims as the cases have not yet been adjudicated. INAC recommended consultation with legal counsel to determine the potential effects of these actions on the lands within the Study Area.

A summary of the agency consultation is included in Appendix B1 and copies of correspondence with INAC are located in **Appendix B3**.

4.7 HERITAGE AND ARCHAEOLOGICAL RESOURCES

A Stage I archaeological assessment background study, completed for the Original EA (1993), resulted in the identification of no known sites. The fact that no sites were known to be located in close proximity to the preferred route resulted in a potential for unrecorded sites to occur, especially near historic transportation routes.

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As a result of the Stage I findings, Archaeological Research Associates Ltd. (ARAL) undertook a Stage II archaeological assessment in 1992 to determine the presence of any archaeological resources that may exist along the preferred route. There were no sites found along the preferred route. The study was undertaken in accordance with the Ministry of Culture and Communications guidelines for archaeological assessments.

To ensure that there had been no additional archaeological findings since the 1998 ESIA report, our office contacted John MacDonald from the Ministry of Culture in July 2006. He stated that if the Preferred Route changed from that in 1993, a Stage II Archaeological Assessment is recommended to be completed before construction can commence. A copy of this correspondence can be found in **Appendix B3**.

Should deeply buried archaeological resources be found during construction anywhere within the preferred route, the Ministry of Culture should be notified immediately. If deemed necessary by the Ministry, a licensed archaeological consultant may be required to develop site-specific mitigative measures and oversee site salvage operations.

As is possible on virtually any property in southern Ontario, unmarked Aboriginal or Euro Canadian burials could be encountered during construction. In the event that human remains are encountered before or during construction, Enbridge should stop all work immediately and contact both the Ministry of Culture, and the Registrar or the Deputy Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations, as well as the appropriate municipal police, and local medical officer of health.

The full Archaeological Assessment can be found in **Appendix E**.

4.8 EXISTING LINEAR CORRIDORS

Linear corridors are a common feature of the Study Area. They include road networks, electric and telephone corridors, and hydrocarbon pipelines. **Figure C1-1, Appendix C1** shows the location of the majority of the following features.

4.8.1 Roads

Three roads traverse the Study Area in a typical grid pattern of north-south and east-west. Highway 80, or Courtright Road is a county road and Moore Road 6, Ladysmith Road, and Tecumseh Road are township roads. Highway 80 and Moore Road 6 travel east-west through the Study Area while Ladysmith Road and Tecumseh Road travel north-south.

There are no existing or abandoned railway networks in the Study Area.

4.8.2 Hydrocarbon Transmission Lines

Several companies own and operate natural gas pipelines within the Study Area. There are numerous pipelines that traverse the Study Area in north-south, east-west, northwest-southeast and northeast-southwest directions. The majority of these pipelines are associated with the

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three natural gas storage pools in the Study Area. These pools are Enbridge's Ladysmith Pool, and their Kimball-Colinville Pool, and Union Gas's Payne Pool. These three underlying natural gas storage pools are comprised of access roads, wellheads, and gathering pipelines and Union Gas also has a Compressor Station in their Payne Pool. **Figure C1-1, Appendix C1** shows the locations of these pools.

4.8.3 Electricity Transmission Lines and Facilities, and Telephone Corridors

There are two high voltage electric transmission corridors in the Study Area. A 230 kV line travels east-west along Highway 80 and a 115 kV line travels north-south along the division between Township of St. Clair lots 19 and 20. Electric power is distributed throughout the Study Area by a system of single line supported on wooden poles inside the municipal road allowances. Telephone lines either use this same network or are buried in the road allowance.

4.9 WASTE DISPOSAL SITES AND CONSERVATION LANDS

There is one active landfill in the Study Area. The Moore Landfill Site is located approximately 1 km north of County Road 80 (Courtright Line) at 3198 Ladysmith Rd in the Township of St. Clair. This landfill was opened in 1970 and operates under the conditions outlined in the Certificate of Approval (CofA) No. A031808, issued by the Ministry of the Environment (MOE) on September 25, 1996. The 143 acre site, encompassing a landfill area of 21 acres accepts household and commercial waste from residents of the County of Lambton only. There are restrictions on the material allowed into the site, including: construction and demolition material; liquid or hazardous waste; industrial waste; field stones or concrete; tree stumps or limbs; dead animals or animal waste, and; ashes.

**APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE
POOL PROJECT ~ ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING TEXT**

Socio-Economic Features

May 2007

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5.0 Bibliography

- Brown, D.M., G.A. McKay and L.J. Chapman 1968. The Climate of Southern Ontario. Environment Canada, Climatological Studies No. 5: 50 p.
- Chapman, L.J. and D.F. Putnum. 1984. The Physiography of Southern Ontario. Ontario Geological Survey, Special Volume 2:270 p.
- County of Lambton. 1998. Official Plan. Lambton County Planning & Development Department.
- County of Lambton. 2001. Township of St. Clair Official Plan. Lambton County Planning & Development Department.
- County of Lambton. 2003. Township of St. Clair Comprehensive Zoning By-Law. Lambton County Planning & Development Department.
- County of Lambton. 2007. Personal Communication with Ezio Nadalin.
- Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists: Don Mills, Ontario.
- Environment Canada. 2004. Canadian Climate Normals 1971 to 2000. Reviewed March, 2007. Available: http://climate.weatheroffice.ec.gc.ca/climate_normals/results_e.html
- Environment Canada. 2006. Geographic Query. Reviewed March 2007. Available: http://www.speciesatrisk.gc.ca/map/default_e.cfm.
- Hosie, R.C. 1975. Native Trees of Canada. Canadian Forestry Service. Department of the Environment. Ottawa.
- Matthews, B.C., N.R. Richards and R.E. Wicklund. 1957. Soil Survey of Lambton County Report No. 22 of the Ontario Soil Survey.
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Reviewed April, 2007. Available <http://www.natureserve.org/explorer>.
- Natural Heritage Information Centre (NHIC). 2005. Geographic Area Query. Reviewed March 2007. Available: <http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic.cfm>.

**APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE
POOL PROJECT ~ ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING TEXT**

Bibliography
May 2007

Natural Resources Canada. 2004. Mapping Federal-Provincial-Territorial Mining Knowledge. Reviewed March 2007. Available:
http://mmsd2.mms.nrcan.gc.ca/maps/mapframe_e.asp.

Natural Resources Canada. 2005a. SEISMIC ZONING MAP OF CANADA, 1985: ACCELERATION (NBCC). Reviewed November 2006. Available:
http://earthquakescanada.nrcan.gc.ca/hazard/zoning/seismiczonea_e.php.

Natural Resources Canada. 2005b. SEISMIC ZONING MAP OF CANADA, 1985: VELOCITY (NBCC). Reviewed November 2006. Available:
http://earthquakescanada.nrcan.gc.ca/hazard/zoning/seismiczonev_e.php.

Ontario Breeding Bird Atlas internet database. Atlas records 2001 to 2005. Reviewed 2007 Available: <http://www.birdsontario.org/atlas>.

Ontario Geological Survey. 2006. Draft version of the Paleozoic bedrock of southern Ontario compilation map (ZIP file); Ontario Geological Survey, unedited draft version, August 16, 2006, Reviewed March 2007. Available temporarily:
http://www.mndm.gov.on.ca/mndm/mines/ogs/draftbedrock_e.asp.

Ontario Ministry of Agriculture and Food (OMAF). 1981. Agriculture Resource Inventory. Agriculture Drainage Systems Map. Scale 1:25,000.

Ontario Ministry of Agriculture and Food (OMAF). 1983. Agriculture Resource Inventory. Agriculture Land Use Systems Map. Scale 1:50,000.

Ontario Ministry of Natural Resources, Chatham District (MNR). Undated. Dawn and Enniskillen Township Forest Resources. Scale 1:50,000 (unpublished data). Dawn and Enniskillen Township Petroleum and Aggregate Resources. Scale 1:50,000 (unpublished). Dawn and Enniskillen Township Environmentally Significant and Environmentally Sensitive Areas. Scale 1:50,000 (unpublished).

Ontario Ministry of Natural Resources/Environment Canada (MNR/EC). 1984. An Evaluation System for Wetlands for Ontario South of the Precambrian Shield. Second Edition.

Ontario Ministry of Natural Resources (MNR). 2002a. Overview of Ontario's Forests. Reviewed March 2007. Available:
<http://ontariosforests.mnr.gov.on.ca/forestoverview.cfm#regions>.

Ontario Ministry of Natural Resources (MNR). 2002b. Ontario Herpetofaunal Summary Atlas. Reviewed March 2007. Available: <http://nhic.mnr.gov.on.ca/MNR/nhic/herps/ohs.html>.

Ontario Ministry of the Environment (MOE). 1980. Hydrogeological Environments and the Susceptibility of Groundwater to Contamination. Map S100, Water Resources Branch.

Ontario Ministry of the Environment (MOE). 1988. Lambton County 34. Water Well Logs, unpublished data, London Region for Dawn and Enniskillen Townships.

**APPENDIX C2 – TECUMSEH COMPRESSOR STATION TO LADSYMITH NATURAL GAS STORAGE
POOL PROJECT ~ ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING TEXT**

Bibliography

May 2007

Ontario Ministry of the Environment (MOE). 2005. *Water Well Records*. Groundwater Bulletin Report. Water Well Data System.

Sarnia-Lambton Office of Economic Development, 2000. Business Directory Data Base
http://www.sarnialambton.on.ca/newpages/main_pages/mainpage.html

Statistics Canada. 2001. Community Query. Modified January 2007. Reviewed April 2007.
Available:
<http://www12.statcan.ca/english/profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CD&Code1=3538&Geo2=CSD&Code2=3538003&Data=Count&SearchText=lambton&SearchType=Begins&SearchPR=01&B1=All>.

Statistics Canada. 2002. 2001 Census of Agriculture Farm Data: Full Release. CD-ROM.

Attachment 1

Common Avian Species

Species list for square 17LG47 (number of entries returned: 97)

| Region | Square | Species | Breeding Evidence | | | Point Counts | | | |
|--------|--------|----------------------------|-------------------|-------|-----|--------------|------|------|-----|
| | | | Max BE | Categ | #Sq | #PC | %PC | Abun | #Sq |
| 1 | 17LG47 | American Bittern | H | POSS | 1 | | | | |
| 1 | 17LG47 | Least Bittern | T | PROB | 1 | | | | |
| 1 | 17LG47 | Great Blue Heron | H | POSS | 1 | | | | |
| 1 | 17LG47 | Green Heron | H | POSS | 1 | | | | |
| 1 | 17LG47 | Turkey Vulture | T | PROB | 1 | | | | |
| 1 | 17LG47 | Canada Goose | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Wood Duck | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Mallard | FY | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Redhead | X | OBS | 1 | | | | |
| 1 | 17LG47 | Northern Harrier | X | OBS | 1 | | | | |
| 1 | 17LG47 | Cooper's Hawk | NY | CONF | 1 | | | | |
| 1 | 17LG47 | Red-tailed Hawk | AE | CONF | 1 | | | | |
| 1 | 17LG47 | American Kestrel | FY | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Ring-necked Pheasant | S | POSS | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Wild Turkey | H | POSS | 1 | | | | |
| 1 | 17LG47 | Sandhill Crane | X | OBS | 1 | | | | |
| 1 | 17LG47 | Killdeer | FY | CONF | 1 | 15 | 60.0 | 1.48 | 1 |
| 1 | 17LG47 | Lesser Yellowlegs | X | OBS | 1 | | | | |
| 1 | 17LG47 | Solitary Sandpiper | X | OBS | 1 | | | | |
| 1 | 17LG47 | Spotted Sandpiper | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Wilson's Snipe | X | OBS | 1 | | | | |
| 1 | 17LG47 | American Woodcock | T | PROB | 1 | | | | |
| 1 | 17LG47 | Ring-billed Gull | NE | CONF | 1 | 2 | 8.0 | 0.12 | 1 |
| 1 | 17LG47 | Rock Pigeon | T | PROB | 1 | 2 | 8.0 | 2.12 | 1 |
| 1 | 17LG47 | Mourning Dove | NE | CONF | 1 | 14 | 56.0 | 1.76 | 1 |
| 1 | 17LG47 | Black-billed Cuckoo | FS | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Yellow-billed Cuckoo | S | POSS | 1 | | | | |
| 1 | 17LG47 | Black/Yellow-billed Cuckoo | T | PROB | 1 | | | | |
| 1 | 17LG47 | Eastern Screech-Owl | T | PROB | 1 | | | | |
| 1 | 17LG47 | Great Horned Owl | T | PROB | 1 | | | | |
| 1 | 17LG47 | Long-eared Owl | T | PROB | 1 | | | | |
| 1 | 17LG47 | Northern Saw-whet Owl | X | OBS | 1 | | | | |
| 1 | 17LG47 | Common Nighthawk | T | PROB | 1 | | | | |

| | | | | | | | | | |
|---|--------|-------------------------------|----|------|---|----|------|------|---|
| 1 | 17LG47 | Chimney Swift | D | PROB | 1 | | | | |
| 1 | 17LG47 | Ruby-throated Hummingbird | H | POSS | 1 | | | | |
| 1 | 17LG47 | Red-bellied Woodpecker | D | PROB | 1 | | | | |
| 1 | 17LG47 | Downy Woodpecker | FY | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Hairy Woodpecker | NY | CONF | 1 | | | | |
| 1 | 17LG47 | Northern Flicker | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Eastern Wood-Pewee | T | PROB | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Yellow-bellied Flycatcher | X | OBS | 1 | | | | |
| 1 | 17LG47 | Willow Flycatcher | T | PROB | 1 | | | | |
| 1 | 17LG47 | Least Flycatcher | X | OBS | 1 | | | | |
| 1 | 17LG47 | Eastern Phoebe | X | OBS | 1 | | | | |
| 1 | 17LG47 | Great Crested Flycatcher | D | PROB | 1 | | | | |
| 1 | 17LG47 | Eastern Kingbird | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Yellow-throated Vireo | A | PROB | 1 | | | | |
| 1 | 17LG47 | Warbling Vireo | T | PROB | 1 | | | | |
| 1 | 17LG47 | Red-eyed Vireo | D | PROB | 1 | | | | |
| 1 | 17LG47 | Blue Jay | AE | CONF | 1 | | | | |
| 1 | 17LG47 | American Crow | P | PROB | 1 | | | | |
| 1 | 17LG47 | Horned Lark | FY | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Tree Swallow | FY | CONF | 1 | 3 | 12.0 | 0.16 | 1 |
| 1 | 17LG47 | Northern Rough-winged Swallow | T | PROB | 1 | | | | |
| 1 | 17LG47 | Cliff Swallow | AE | CONF | 1 | | | | |
| 1 | 17LG47 | Barn Swallow | NY | CONF | 1 | 9 | 36.0 | 0.8 | 1 |
| 1 | 17LG47 | Black-capped Chickadee | FY | CONF | 1 | | | | |
| 1 | 17LG47 | White-breasted Nuthatch | FY | CONF | 1 | | | | |
| 1 | 17LG47 | House Wren | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Golden-crowned Kinglet | X | OBS | 1 | | | | |
| 1 | 17LG47 | Blue-gray Gnatcatcher | P | PROB | 1 | | | | |
| 1 | 17LG47 | Eastern Bluebird | P | PROB | 1 | | | | |
| 1 | 17LG47 | Veery | S | POSS | 1 | | | | |
| 1 | 17LG47 | Hermit Thrush | X | OBS | 1 | | | | |
| 1 | 17LG47 | Wood Thrush | T | PROB | 1 | | | | |
| 1 | 17LG47 | American Robin | FY | CONF | 1 | 19 | 76.0 | 1.84 | 1 |
| 1 | 17LG47 | Gray Catbird | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Brown Thrasher | P | PROB | 1 | | | | |
| 1 | 17LG47 | European Starling | CF | CONF | 1 | 22 | 88.0 | 5.92 | 1 |

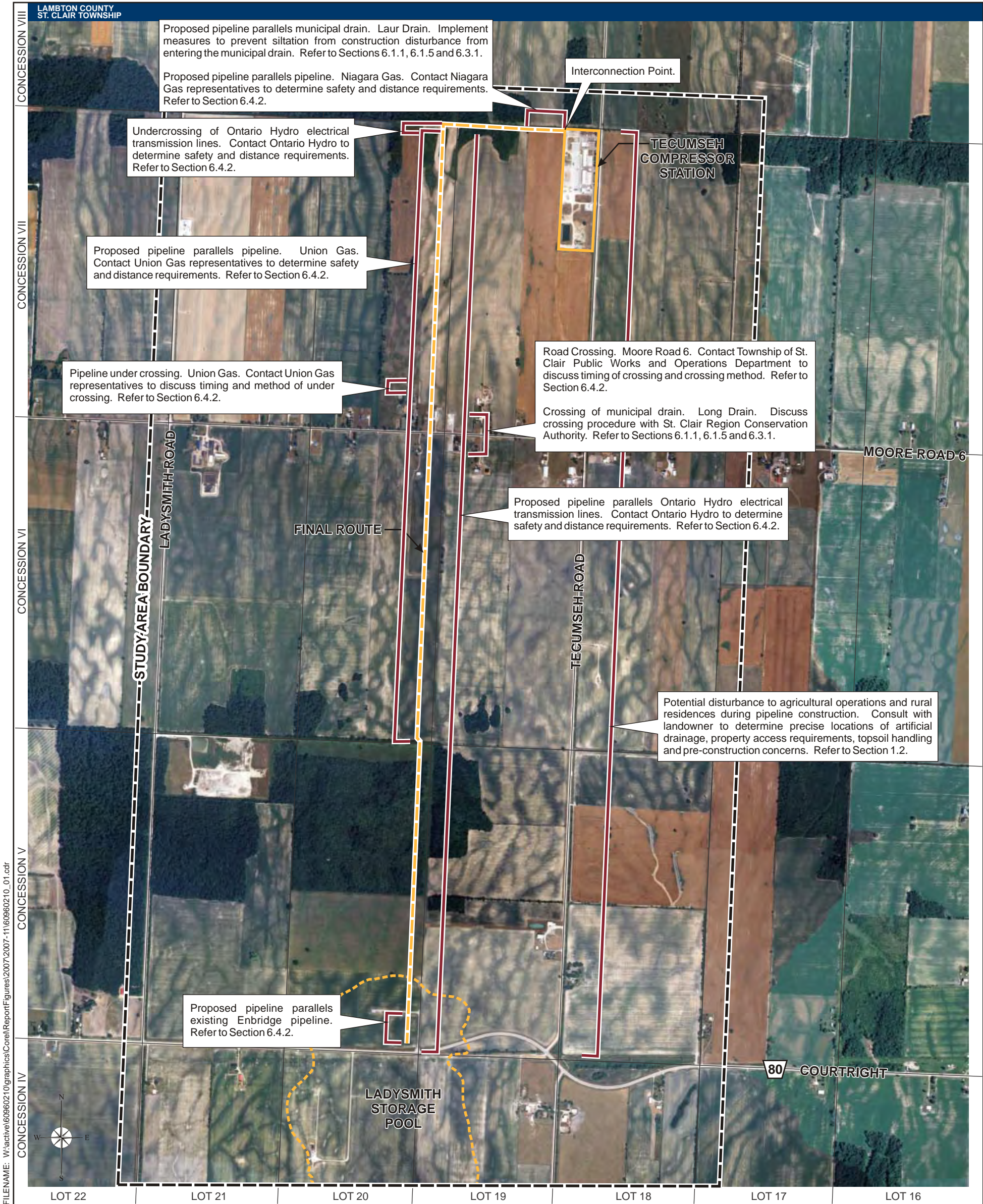
| | | | | | | | | | |
|---|--------|------------------------------|----|------|---|----|------|------|---|
| 1 | 17LG47 | Cedar Waxwing | CF | CONF | 1 | | | | |
| 1 | 17LG47 | Yellow Warbler | FY | CONF | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Black-throated Green Warbler | X | OBS | 1 | | | | |
| 1 | 17LG47 | Pine Warbler | X | OBS | 1 | | | | |
| 1 | 17LG47 | American Redstart | X | OBS | 1 | | | | |
| 1 | 17LG47 | Common Yellowthroat | T | PROB | 1 | | | | |
| 1 | 17LG47 | Scarlet Tanager | S | POSS | 1 | | | | |
| 1 | 17LG47 | Eastern Towhee | S | POSS | 1 | | | | |
| 1 | 17LG47 | Chipping Sparrow | FY | CONF | 1 | 11 | 44.0 | 0.56 | 1 |
| 1 | 17LG47 | Field Sparrow | T | PROB | 1 | 2 | 8.0 | 0.08 | 1 |
| 1 | 17LG47 | Vesper Sparrow | P | PROB | 1 | | | | |
| 1 | 17LG47 | Savannah Sparrow | A | PROB | 1 | 1 | 4.0 | 0.04 | 1 |
| 1 | 17LG47 | Song Sparrow | CF | CONF | 1 | 18 | 72.0 | 0.96 | 1 |
| 1 | 17LG47 | White-throated Sparrow | X | OBS | 1 | | | | |
| 1 | 17LG47 | Northern Cardinal | FY | CONF | 1 | 5 | 20.0 | 0.2 | 1 |
| 1 | 17LG47 | Rose-breasted Grosbeak | FY | CONF | 1 | | | | |
| 1 | 17LG47 | Indigo Bunting | CF | CONF | 1 | | | | |
| 1 | 17LG47 | Bobolink | CF | CONF | 1 | | | | |
| 1 | 17LG47 | Red-winged Blackbird | CF | CONF | 1 | 10 | 40.0 | 0.6 | 1 |
| 1 | 17LG47 | Eastern Meadowlark | H | POSS | 1 | | | | |
| 1 | 17LG47 | Common Grackle | FY | CONF | 1 | 16 | 64.0 | 2.16 | 1 |
| 1 | 17LG47 | Brown-headed Cowbird | FY | CONF | 1 | 3 | 12.0 | 0.24 | 1 |
| 1 | 17LG47 | Orchard Oriole | S | POSS | 1 | | | | |
| 1 | 17LG47 | Baltimore Oriole | FY | CONF | 1 | | | | |
| 1 | 17LG47 | House Finch | FY | CONF | 1 | | | | |
| 1 | 17LG47 | American Goldfinch | FY | CONF | 1 | 2 | 8.0 | 0.08 | 1 |
| 1 | 17LG47 | Evening Grosbeak | X | OBS | 1 | | | | |
| 1 | 17LG47 | House Sparrow | AE | CONF | 1 | 15 | 60.0 | 2.56 | 1 |

Disclaimer: Data contained in these summaries are provisional data that have not necessarily been reviewed or edited, and may be subject to significant change. These data have been released for public interest only. If you wish to use the data in a publication, research or for any purpose, or would like information concerning the accuracy and appropriate uses of these data, contact Nicole Kopysh, at telephone: 519-826-2092, e-mail: atlas@uoguelph.ca.

These data are current as of 23 Apr 2007.

Appendix D

Photomosaics



Base Map Source: Monteith and Southerland, 2002, Original Scale 1:6,100.

Metres 0 165 330
Scale 1:16,500

| | |
|-----------------|-----------------|
| PROJECT NAME: | |
| LADYSMITH | |
| CLIENT NAME: | |
| ENBRIDGE | |
| DATE INITIATED: | FILENAME: |
| MARCH, 2007 | 60960210_01.cdr |
| FIGURE NO. 1.0 | |

MITIGATION
MAPPING



| | | | |
|-------------|-----------|-------------|-----------|
| PROJECT NO: | | | |
| 160960210 | | | |
| REV. NO. | SHEET NO. | CHECKED BY: | APPROVED: |
| 0 | 1 OF 1 | MA | DPW |
| | | DRAWN BY: | CEW |

Appendix E

Archaeological Assessment

Stage One
Archaeological Assessment

ARCHAEOLOGICAL ASSESSMENT
STAGE 1: BACKGROUND STUDY
TECUMSEH GAS STORAGE LTD
PROPOSED LADYSMITH PROJECT
MOORE TOWNSHIP
COUNTY OF LAMBTON

Prepared for

Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario N1G 3M5

by

L.R. Bud Parker
ARCHAEOLOGICAL RESEARCH ASSOCIATES LTD.
R.R. 2, Petersburg, Ontario N0B 2H0

under

Ontario Heritage Foundation
Licence No. 92-023

September 1992

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| 3.0 | Locations | 1 |
| 4.0 | Geography and Archaeological Potential | 2 |
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| 6.0 | Conclusions and Recommendations | 4 |
| 7.0 | References Cited | 5 |
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| | Figures | 7 |
| | Appendix | 9 |

1.0 Personnel

- 1.1 Project Director: Dean H. Knight
- 1.2 Project Manager: L.R. Parker
- 1.3 Background Research: L.R. Parker
- 1.4 Report Preparation: L.R. Parker
- 1.5 Graphics: L.R. Parker

2.0 Introduction

Under a contract awarded in September 1992, the proposed Tecumseh Gas Storage Ltd., Ladysmith study area in Lambton County, Ontario, was archaeologically assessed for known and potential archaeological resources by Archaeological Research Associates Ltd. This work was under contract granted by Ecological Services for Planning Ltd. of Guelph. This "Stage One" archaeological assessment was conducted to determine the presence of any known heritage resources, and the potential for archaeological resources which might be extant on the property and, if so, what steps need to be taken for their management. The study was conducted in accordance with Ministry of Culture and Communications guidelines for Stage One archaeological assessments (TFSR 1992:6-9).

3.0 Location

The study area consists of a small land parcel, in central Moore Township in western Lambton County. The study area is delineated, approximately, by Concession Road VIII in the north; Regional Road 31, in the east; Concession Road II in the south; and Highway 40 west (Figures 1 and 2).

The proposed pipeline is to begin in Lot 19, Concession VI, and ends in Lots 19 and 20, Concession IV.

4.0 Geography and Archaeological Potential

The subject land lie within the Carolinian Biotic Province, which is described as favouring the growth of:

...oak, hickory, maple, beech, walnut, butternut, elm, tulip, ash, basswood, sycamore and cottonwood. Cedar and tamarack are fairly common in swampy tracts. White pines and even spruce are locally numerous ... especially in the north reaches of the biome (Mason 1981:60, in Janusas 1987:3).

The physiographic region of the study area is predominately part of the St. Clair Clay Plains. Soils of the St. Clair Clay Plains are characteristically heavy in texture and poorly drained. In Lambton, they are known as the Lambton Clay Plain, and contain areas of bevelled till plains covered by a thin veneer of lacustrine clays. These conditions favour the Lambton area in contrast to the Essex region, with the former exhibiting better vegetation development and drainage features (Chapman and Putnam 1969:243). There are two soil types in the region: Brookston and Caistor clays, both of which are imperfectly drained (ibid).

The underlying bedrock of the study area is of the Upper Devonian shales of the Kettle Point and Port Lambton formations (Poole et al 1972:284). The bedrock varies in depth below the surface till, but is nevertheless deeply buried, and does not outcrop.

The archaeological potential of the lands were assessed using their soils, hydrology, and landforms as considerations. According to Janusas: "The location of early settlements tended to be dominated by the proximity to a reliable and potable water

resource..." (1988:1). The study area has no obvious sources, using the NTS 1:50,000 topographic map. The soils, being imperfectly drained, and the proximity to water sources imply a moderate potential for prehistoric archaeological sites (see Appendix One).

The potential for historic sites is high in the study area. According to historical sources, the study area was settled by Europeans in the mid-nineteenth century. Among the first settlers were British and North American farmers who settled along the available concession roads (Phelps 1973:70). The nearest large settlement is Courtright, which was settled first by Francis Decatur before 1800, but was not an established town until the establishment of the Canada Southern Railway (modern Highway 80 follows the old railbed) (ibid:17). Most of the 1880 atlas subscribers in the study area arrived in Moore Township between 1848 and 1877 (ibid:70), while a few significant historical buildings were in existence in 1880 (ie. school in Lot 22, Concession VI, Templar Hall in Lot 19, Concession VIII) (ibid). The small hamlet of Seckerton is within the study area, and like other nearby small, rural communities, it was established in the last quarter of the 19th century (ibid:62).

5.0 Background Research

Archival research was conducted using the Ministry of Culture and Communications site data files in order to determine the presence of any known heritage resources which might be located in the study area. It was found that in the study area there are no registered archaeological sites, and no sites are located within three kilometres.

Given that the study area has no known archaeological sites, and exhibits

moderate to high archaeological potential for yet undiscovered archaeological remains, then it is anticipated that any selected preferred pipeline routes may impact unknown sites. Of course, if the preferred routes are aligned within already disturbed lands (ie. road allowances, or other pipeline easements), then the negative impacts of the proposed pipeline on archaeological heritage will be greatly lessened. It is suggested, that based on past studies, and using some models of archaeological site potential (Peters 1986; Pihl 1986), most prehistoric archaeological sites will be found within 150 metres of remnant or extant water sources. However, non-habitation sites (ie. burials, resource gathering sites, and kill sites), may be located anywhere. Historic sites tend to be near the transportation routes of the study area, namely: post-1850 sites are located along the historically surveyed roads.

6.0 Conclusions and Recommendations

The archaeological assessment background study for the study area has resulted in the identification of no known archaeological sites. The potential for unrecorded sites is high, especially near historic transportation routes.

We recommend that further archaeological studies are needed to assist in predicting potential heritage resource impacts along the proposed preferred installation routes of the pipeline in the study area. These studies would entail Stages 2 and 3 (TF SR 1992) of an archaeological assessment along the corridor of the proposed preferred route. In these studies, all lands slated for pipeline impact shall be searched using visual survey and/or shovel test-pitting, in areas deemed to have had minimal, recent disturbances (ie. not previously impacted by land developments such as road construction). From these studies the results should provide a more complete inventory

of the archaeological resources within the preferred routes, and heritage management options will be presented for further work, if required.

7.0 References Cited

Chapman, L.J., and D.F. Putnam

1966 The Physiography of Southern Ontario. University of Toronto Press, Toronto.

Janusas, S.E.

1987 An Analysis of the Historic Vegetation of the Regional Municipality of Waterloo. Regional Municipality of Waterloo.

1988 The Cultural Implications of Drainage in the Municipality of Waterloo. Regional Municipality of Waterloo.

1991 Archaeology Brochure from the Archaeology Division, Regional Municipality of Waterloo, Planning and Development Department.

Mason, R.

1981 Great Lakes Archaeology. Academic Press, New York.

Murphy, C., and N. Ferris

1990 The Late Woodland Western Basin Tradition in Southwestern Ontario. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:189-278.

Peters, J.

1986 Transmission Line Planning and Archaeological Resources: A Model of Archaeological Potential for Southwestern Ontario. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:19-

Phelps, E.

1973 Belden's Illustrated Historical Atlas of the County of Lambton Ontario, 1880. Port Elgin, Ontario. (Reprint of original).

Pihl, R.

1986 Site Potential Modelling in Archaeological Consulting. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:29-40.

- Poole, W.H., B.V. Sanford, H. Williams, and D.G. Kelley
1972 Geology of Southeastern Canada. Geology and Economic Minerals of Canada. Edited by R.J.W. Douglas. Geological Survey of Canada, Economic Geology Report No. 1, Dept. of Energy, Mines and Resources, Ottawa. pp. 227-304.
- Spence, M.W., R. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:125-170.
- TFSR (Task Force on Self Regulation)
1992 Archaeological Assessment Technical Guidelines: April 1992. Arch Notes. 92-3:6-19.

8.0 Acknowledgements

The study of the proposed pipeline study areas was made possible with the support of Dave Wesenger and Ed Mozuraitis of Ecological Services for Planning Ltd., with additional assistance from Bernice Field, Data Coordinator, Archaeology, Ministry of Culture and Communications, Toronto.

SOUTHERN ONTARIO

COUNTIES AND GEOGRAPHICAL TOWNSHIPS

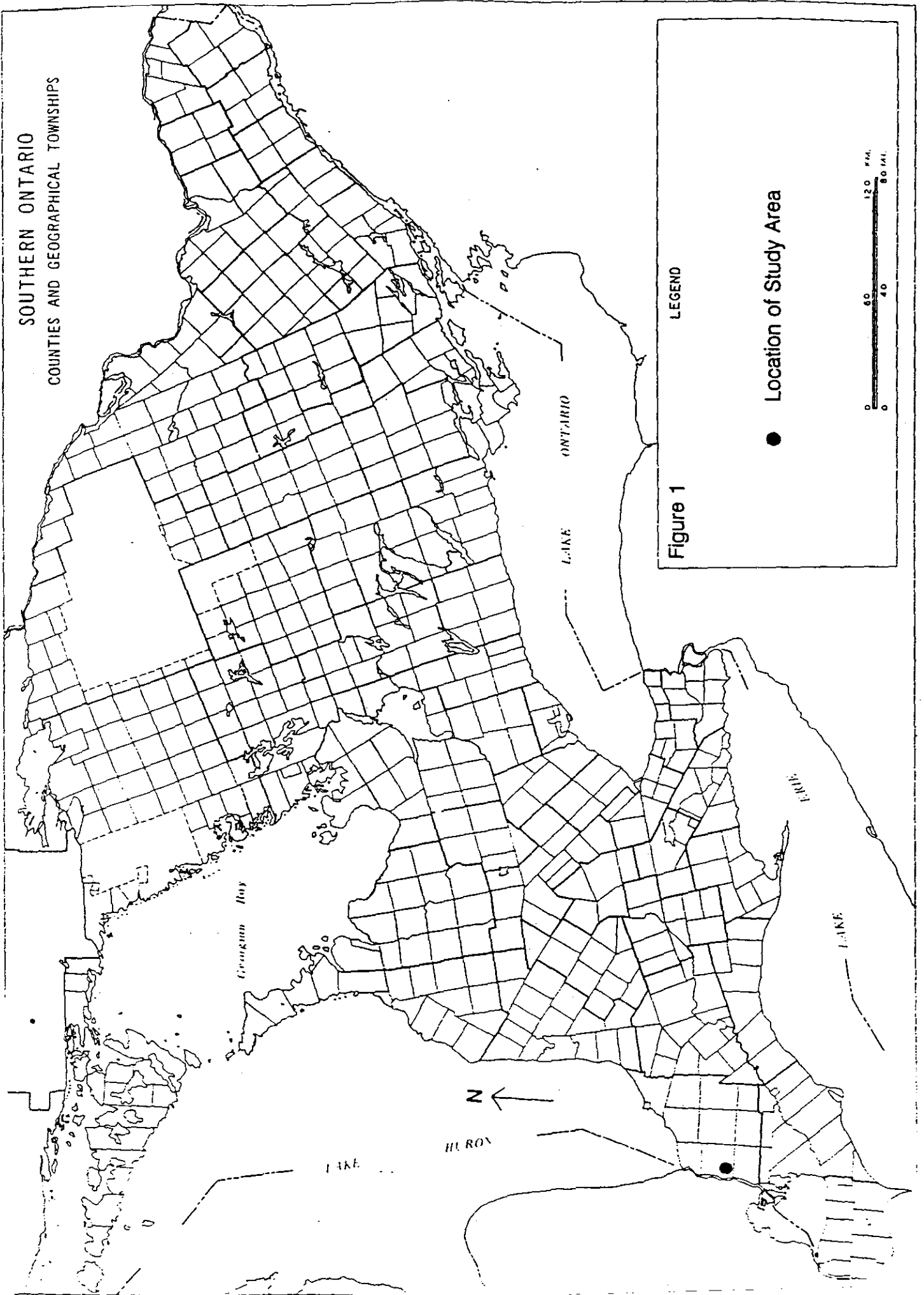
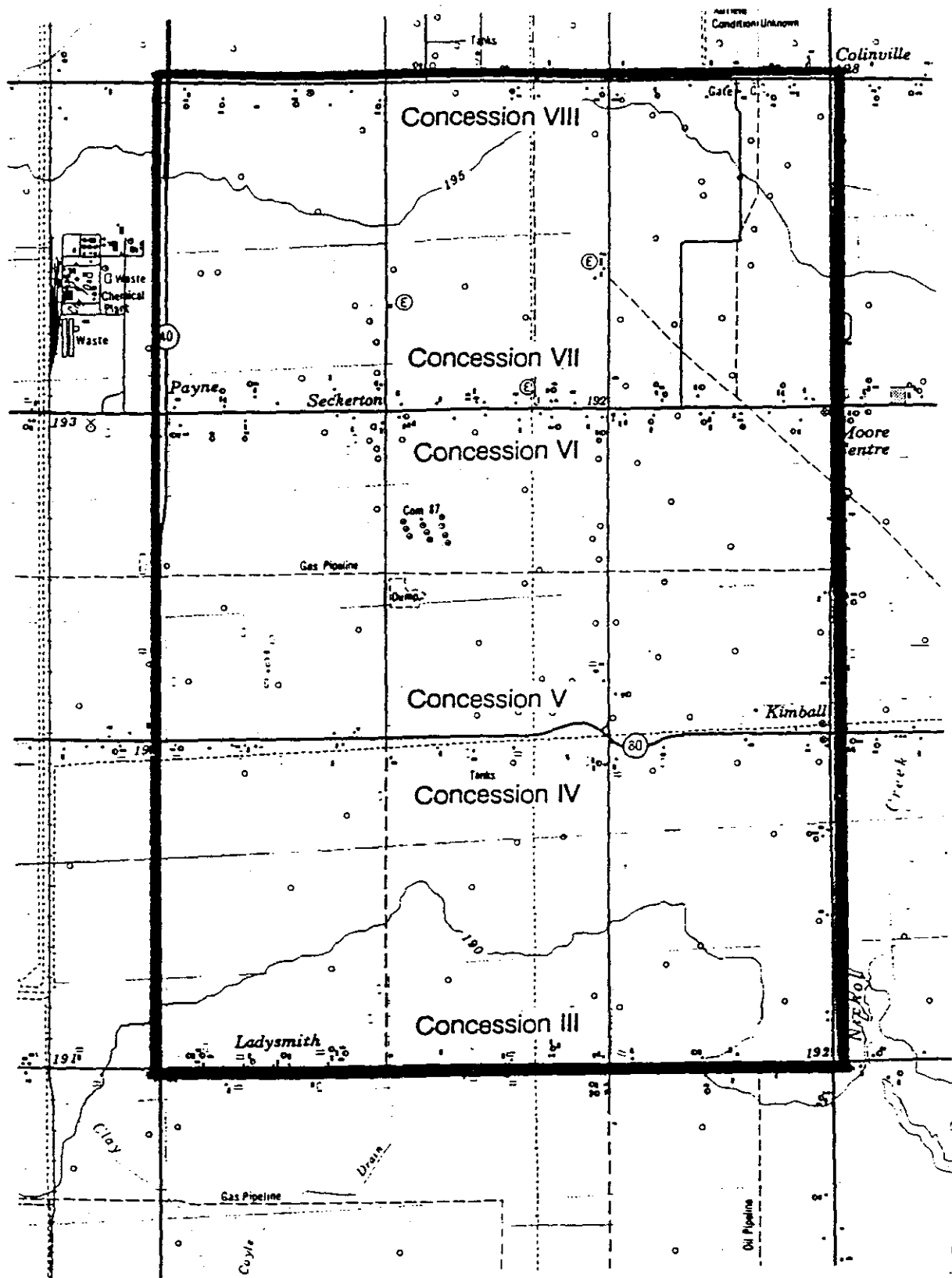


Figure 1

LEGEND

● Location of Study Area

0 40 80 120 M.I.
0 60 120 K.M.



Study Area Boundary

Figure 2

Tecumseh Gas Storage Ltd.
Ladysmith Project

N

Scale 1:50,000

Appendix One

CULTURAL CHRONOLOGY FOR SOUTH WESTERN ONTARIO

| <u>Period</u> | <u>Group</u> | <u>Time Range</u> | <u>Comment</u> |
|---------------|-----------------------------|---------------------|---|
| PALEO-INDIAN | | | |
| | Fluted | 9500 - 8500 B.C. | Big Game hunters; small, nomadic groups |
| | Hi-Lo | 8500 - 8000 B.C. | |
| ARCHAIC | | | |
| Early | Side-notched | 8000 - 7700 B.C. | Nomadic hunters and gatherers |
| | Corner-notched | 7700 - 6900 B.C. | |
| | Bifurcate Points | 6900 - 6000 B.C. | |
| Middle | Stemmed Points | 6000 - 3500 B.C. | Transition to territorial settlements |
| | Notched Points | 3500 - 2500 B.C. | |
| WOODLAND | | | |
| Early | Meadowood | 900 - 400 B.C. | Introduction of pottery |
| | Adena | 400 B.C. - A.D. 1 | |
| Middle | Couture/ Riviere au Vase | 300 B.C. - A.D. 500 | Incipient horticulture Transition to village life and agriculture |
| | Riviere au Vase | A.D. 500 - 900 | |
| Late | Younge | A.D. 900 - 1300 | |
| | Springwells | A.D. 1300 - 1400 | Tribal differentiation and warfare |
| | Wolf | A.D. 1400 - 1650 | |
| HISTORIC | | | |
| Early | Historic Native | A.D. 1700 - 1875 | Tribal displacements |
| Late | Euro-Canadian | A.D. 1800 - present | European settlement |

(From: Janusas 1991; Murphy and Ferris 1990:196; Spence et al 1990:144)

Stage Two
Archaeological Assessment

ARCHAEOLOGICAL ASSESSMENT
TECUMSEH GAS STORAGE LTD
PROPOSED LADYSMITH PROJECT
MOORE TOWNSHIP
COUNTY OF LAMBTON

Prepared for

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by

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under

Ontario Heritage Foundation
Licence No. 92-023

November 1992

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1.0 Personnel

- 1.1 Project Director: Dean H. Knight
- 1.2 Field Director: L.R. Parker
- 1.3 Crew: Shawn Standfast
- 1.4 Background Research: L.R. Parker
- 1.5 Report Preparation: L.R. Parker
- 1.6 Graphics: L.R. Parker

2.0 Introduction

Under a contract awarded in October 1992, the proposed Tecumseh Gas Storage Ltd., Ladysmith pipeline and storage pool in Lambton County, Ontario, was archaeologically assessed on November 6, 1992, for archaeological resources by Archaeological Research Associates Ltd. This work was under contract granted by Ecological Services for Planning Ltd. of Guelph. This archaeological assessment was conducted to determine the presence of any archaeological resources which might be extant on the property and, if so, what steps need to be taken for their management. The study was conducted in accordance with Ministry of Culture and Communications guidelines for archaeological assessments (TFSR 1992:6-9).

3.0 Location

The study area consists of a land parcel in central Moore Township in western Lambton County. The study area is basically linear in the northern part, but is enlarged in the south, where the proposed gas storage wells are to be located (Figures 2 and 3).

The proposed pipeline is to begin in Lot 19, Concession VI, and ends in Lots 19

and 20, Concessions IV and V, where it divides itself between several proposed wells.

4.0 Geography and Archaeological Potential

The subject land lies within the Carolinian Biotic Province, which is described as favouring the growth of:

...oak, hickory, maple, beech, walnut, butternut, elm, tulip, ash, basswood, sycamore and cottonwood. Cedar and tamarack are fairly common in swampy tracts. White pines and even spruce are locally numerous ... especially in the north reaches of the biome (Mason 1981:60, in Janusas 1987:3).

The physiographic region of the study area is predominately part of the St. Clair Clay Plains. Soils of the St. Clair Clay Plains are characteristically heavy in texture and poorly drained. In Lambton, they are known as the Lambton Clay Plain, and contain areas of bevelled till plains covered by a thin veneer of lacustrine clays. These conditions favour the Lambton area in contrast to the Essex region, with the former exhibiting better vegetation development and drainage features (Chapman and Putnam 1969:243). There are two soil types in the region: Brookston and Caistor clays, both of which are imperfectly drained (ibid).

The underlying bedrock of the study area is of the Upper Devonian shales of the Kettle Point and Port Lambton formations (Poole et al 1972:284). The bedrock varies in depth below the surface till, but is nevertheless deeply buried, and does not outcrop.

The archaeological potential of the lands were assessed using their soils, hydrology, and landforms as considerations. According to Janusas: "The location of early settlements tended to be dominated by the proximity to a reliable and potable water resource..." (1988:1). The study area has no obvious sources, using the NTS 1:50,000

topographic map. The soils, being imperfectly drained, and the proximity to water sources imply a moderate potential for prehistoric archaeological sites (see Appendix One).

The potential for historic sites is high in the study area. According to historical sources, the study area was settled by Europeans in the mid-nineteenth century. Among the first settlers were British and North American farmers who settled along the available concession roads (Phelps 1973:70). The nearest large settlement is Courtright, which was settled first by Francis Decatur before 1800, but was not an established town until the establishment of the Canada Southern Railway (modern Highway 80 follows the old railbed) (ibid:17). Most of the 1880 atlas subscribers in the study area arrived in Moore Township between 1848 and 1877 (ibid:70).

5.0 Background Research

Archival research was conducted using the Ministry of Culture and Communications site data files in order to determine the presence of any known heritage resources which might be located in the study area. It was found that in the study area there are no registered archaeological sites, and no sites are located within three kilometres.

Given that the study area has a no known archaeological sites, and exhibits moderate to high archaeological potential for yet undiscovered archaeological remains, then it is anticipated that any selected preferred pipeline routes may impact unknown sites. Of course, if the preferred routes are aligned within already disturbed lands (ie. road allowances, or other pipeline easements), then the negative impacts of the proposed pipeline on archaeological heritage will be greatly lessened. It is suggested, that based

on past studies, and using some models of archaeological site potential (Peters 1986; Pihl 1986), most prehistoric archaeological sites will be found within 150 metres of remnant or extant water sources. However, non-habitation sites (ie. burials, resource gathering sites, and kill sites), may be located anywhere. Historic sites tend to be near the transportation routes of the study area, namely: post-1850 sites are located along the historically surveyed roads. In September 1992 Archaeological Research Associates Ltd. conducted a Stage 1, background study, of the study area (ARA 1992), and recommended that further archaeological studies were warranted for the study area. These studies are the subject of this report.

6.0 Methodology

Since the study area is comprised of both ploughed and unploughed lands, the methodologies for conducting the archaeological field assessment were twofold.

Those areas which had been agriculturally worked were visually surveyed at five to 10 meter intervals. In this study, these lands consisted of newly planted winter wheat, standing corn, newly cut forage, soy bean stubble and freshly ploughed fields.

Those areas which were not cultivated (woodlots) were assessed by use of shovel test pitting at five to ten meter intervals. In test pitting, a small (30 cm) pit is hand shovelled to the depth of the underlying subsoil. The contents of this pit are screened through 6 mm mesh.

For both methodologies, if artifacts are encountered (ie. bone, ceramics, metal, stone tools or debitage, glass, charcoal, etc.), then pedestrian and/or test pit intervals are reduced to one meter around the findspot. This intensive secondary searching is used to help delineate the size of the cultural deposit. If deemed necessary, the surface

artifacts of a discovered site are collected and mapped with a fixed datum and transit. In unploughed areas, sites are delineated using a transit and a fixed grid, and a series of test squares. All artifacts collected assist in the evaluation of the significance of the cultural remains.

7.0 Results

In sum, four areas of archaeological interest were discovered during the archaeological assessment conducted by Archaeological Research Associates Ltd. Three of these were found within the storage pool area in the southern portion of the study area, while the fourth was found just to the north of the study area (Figure 3). Previous soil disturbances were observed throughout the study area (Figure 3), and include, road allowances, hydro corridors, gas pipelines, and a late 19th century railbed.

Two of the four areas of archaeological interest are considered important sites, and have been given the designation numbers AeHo-19, and AeHo-20, and registered with the Ministry of Culture and Communications. A brief description of all four archaeological sites is given below:

7.1 Tecumseh A (AeHo-19)

This site consists of a dense surface scatter of domestic and structural debris (20 x 20 metres) from a farmhouse dating to the last decade of the 19th century, and terminating to a period just after the Second World War. The site is currently being ploughed on a semi-annual basis for cash crops. A small collection (46 artifacts) of surface remains were taken for analysis. A catalogue list for the site is found in Appendix Two. Of note at this site were hundreds of red brick fragments, most likely the exterior architectural remains of this house.

7.2 Tecumseh B

This site is also a dense surface scatter (20 x 20 metres), but unlike Tecumseh A, this site dates to a much later period, circa 1920-1970. The surface artifacts included coal, wire, lumber, plastic, concrete, and assorted 20th century domestic debris. Because of its recent age, this site is not considered significant.

7.3 Tecumseh C (AeHo-20)

This site was discovered in a field directly north of Tecumseh A, but on the other side of Highway 80. It consists of a scatter of domestic debris (20 x 20 metres) found in the surface soil of a forage crop. Observed remains included white ironstone, stoneware crockery, ball clay pipe stems (Bannerman/Montreal), and glazed red earthenware. Using the observed remains, we have dated this site to c.1870-1890, based primarily on the paucity of typical early 20th century artifacts.

7.4 Tecumseh D

This site is dissimilar to the other three, in that it is located away from any roads. It consists of a dense scatter of domestic debris (primarily bottle glass) over an area of approximately 30 x 20 metres. The materials observed were typical threaded-topped bottles and jars. Most of the material dates to the middle of the 20th century or earlier. Ceramics observed were white ironstone, lustreware, stoneware, purple printed or green printed earthenwares, and flowblue ware. Based on location, we are interpreting this site as a 20th century midden, not a habitation site, and it is not considered significant.

8.0 Conclusions and Recommendations

The archaeological assessment of the study area has resulted in the identification of four archaeological sites. Two of these (AeHo-19 and AeHo-20) are considered significant because they represent two 19th century farmsteads. The historic Euro-Canadian settlement of this portion of Lambton County occurred in the last half of the 19th century (Phelps 1973). Although other areas of the province were settled more than 50 years before this period, these sites represent the initial homesteads of the lots in which they are located.

We recommend that further archaeological studies are needed only to assist in protecting against negative heritage resource impacts along the proposed preferred

installation routes of pipelines, roads and wells in the vicinity of the two sites (AeHo-19 and AeHo-20). Should the proposed impacts (pipeline installation, access road building, and well drilling), avoid these two sites then no further archaeological studies are required. However if the two sites cannot be avoided, then archaeological work should include: a controlled surface collection of the surface artifacts, followed by; the monitoring of the sites while the nearby pipelines, roads and wells are installed. From these studies the results should provide a more complete interpretation of the early farming families of the late 19th century in Moore Township.

The archaeological assessment of the Ladysmith study area has resulted in the discovery of limited archaeological remains. However, if any, unforeseen, deeply buried cultural remains are encountered during future gas pipeline and/or well, or road installation, then the Ministry of Culture and Communications, and Archaeological Research Associates Ltd. should be immediately contacted.

9.0 References Cited

Archaeological Research Associates Ltd. (ARA)

1992 Archaeological Assessment, Stage 1: Background Study, Tecumseh Gas Storage Ltd., Proposed Ladysmith Project, Moore Township, County of Lambton. Report on file Ministry of Culture and Communications, London and Toronto.

Chapman, L.J., and D.F. Putnam

1966 The Physiography of Southern Ontario. University of Toronto Press, Toronto.

Janusas, S.E.

1987 An Analysis of the Historic Vegetation of the Regional Municipality of Waterloo. Regional Municipality of Waterloo.

1988 The Cultural Implications of Drainage in the Municipality of Waterloo. Regional Municipality of Waterloo.

1991 Archaeology Brochure from the Archaeology Division, Regional Municipality of Waterloo, Planning and Development Department.

Mason, R.

1981 Great Lakes Archaeology. Academic Press, New York.

Murphy, C., and N. Ferris

1990 The Late Woodland Western Basin Tradition in Southwestern Ontario. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:189-278.

Peters, J.

1986 Transmission Line Planning and Archaeological Resources: A Model of Archaeological Potential for Southwestern Ontario. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:19-28.

Phelps, E.

1973 Belden's Illustrated Historical Atlas of the County of Lambton Ontario, 1880. Port Elgin, Ontario. (Reprint of original).

Pihl, R.

1986 Site Potential Modelling in Archaeological Consulting. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:29-40.

Poole, W.H., B.V. Sanford, H. Williams, and D.G. Kelley

1972 Geology of Southeastern Canada. Geology and Economic Minerals of Canada. Edited by R.J.W. Douglas. Geological Survey of Canada, Economic Geology Report No. 1, Dept. of Energy, Mines and Resources, Ottawa. pp. 227-304.

Spence, M.W., R. Pihl, and C. Murphy

1990 Cultural Complexes of the Early and Middle Woodland Periods. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:125-170.

TFSR (Task Force on Self Regulation)

1992 Archaeological Assessment Technical Guidelines: April 1992. Arch Notes. 92-3:6-19.

10.0 Acknowledgements

The study of the proposed pipeline study areas was made possible with the support of Ed Mozuraitis of Ecological Services for Planning Ltd., with additional assistance from the staff of Tecumseh Gas Storage Ltd.

SOUTHERN ONTARIO
COUNTIES AND GEOGRAPHICAL TOWNSHIPS

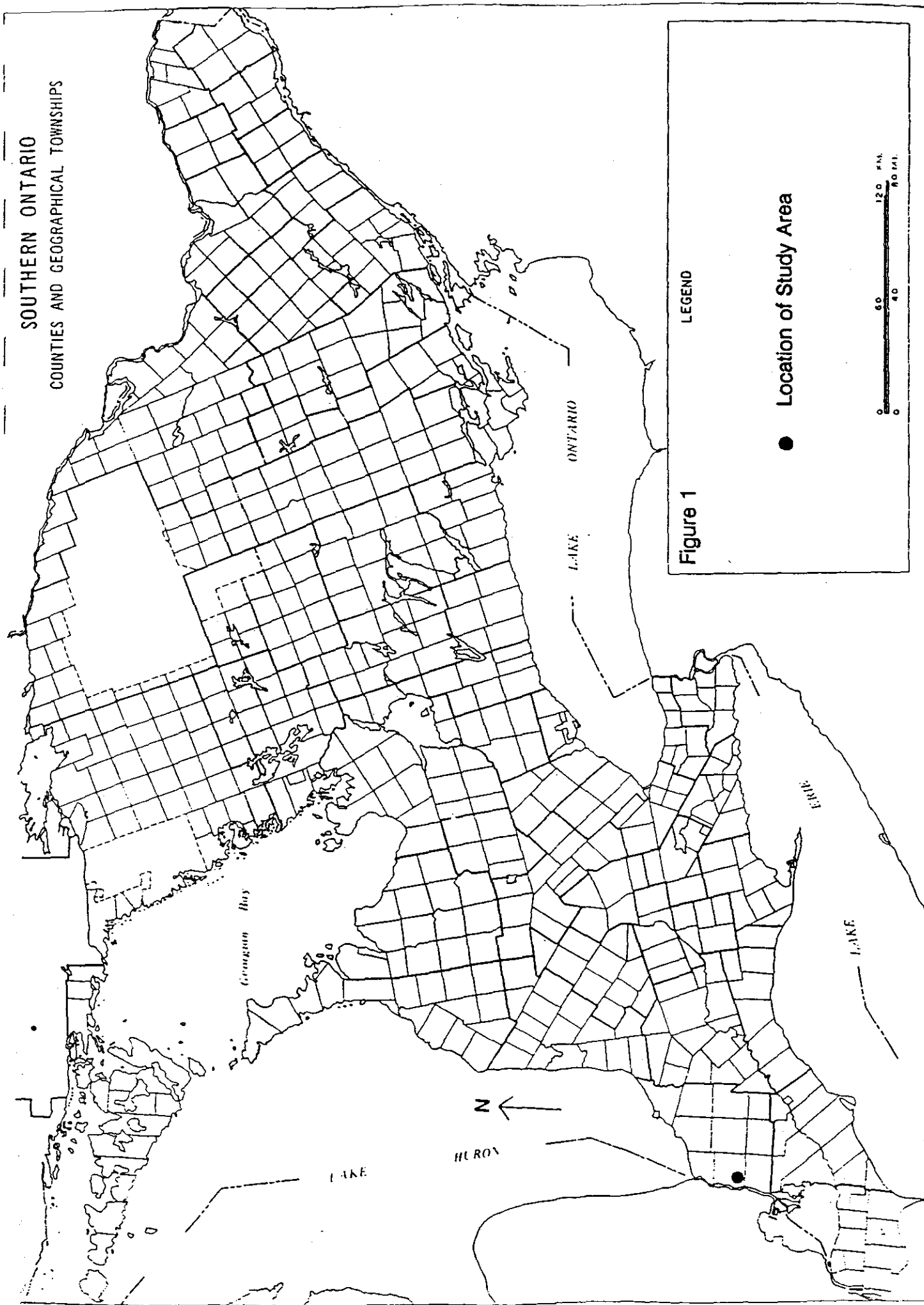


Figure 1

LEGEND

● Location of Study Area

0 40 80 120 KM
0 40 80 MI

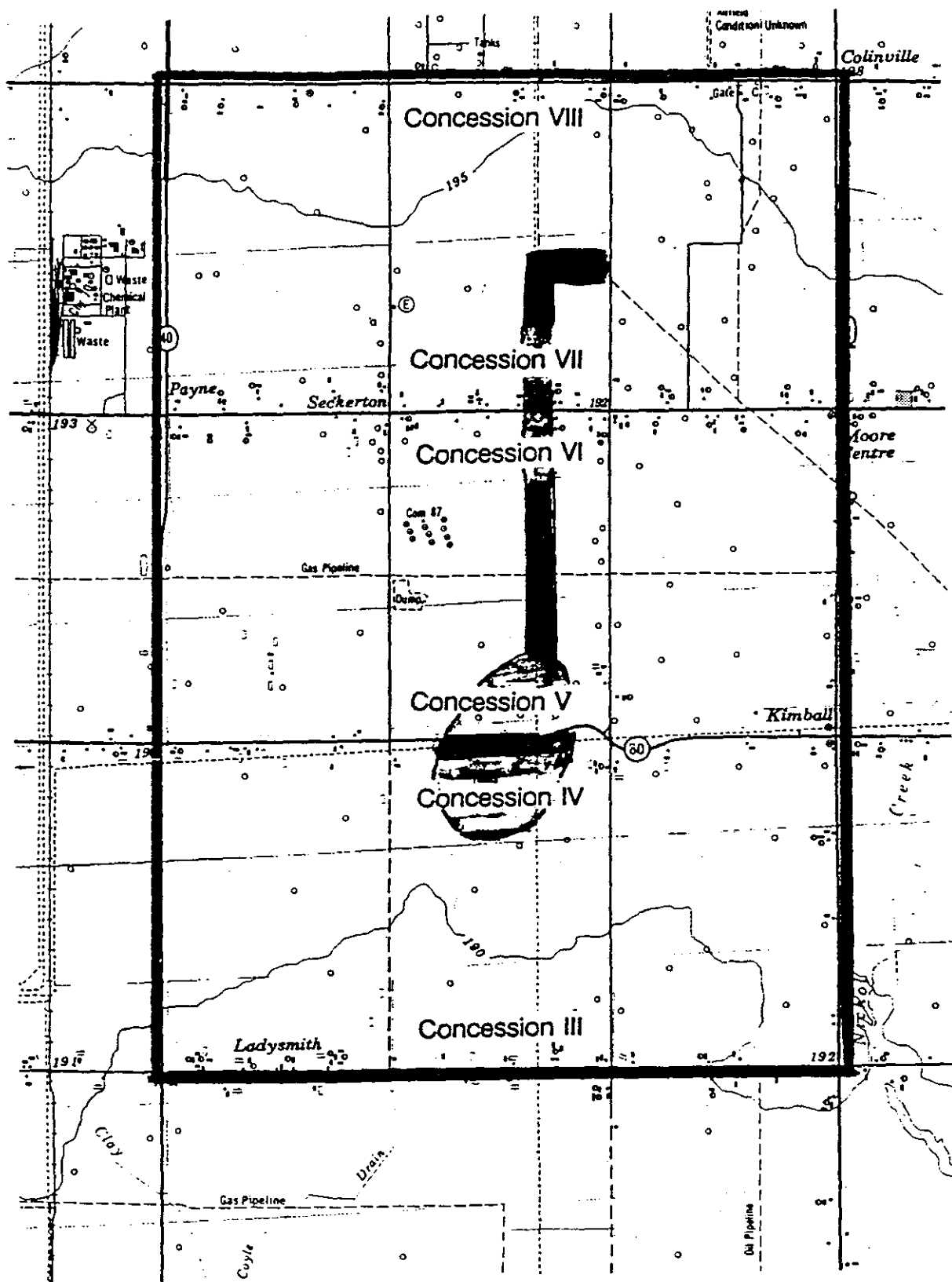


Figure 2

Tecumseh Gas Storage Ltd.
Ladysmith Project



N

Location of Study Area

Scale 1:50,000

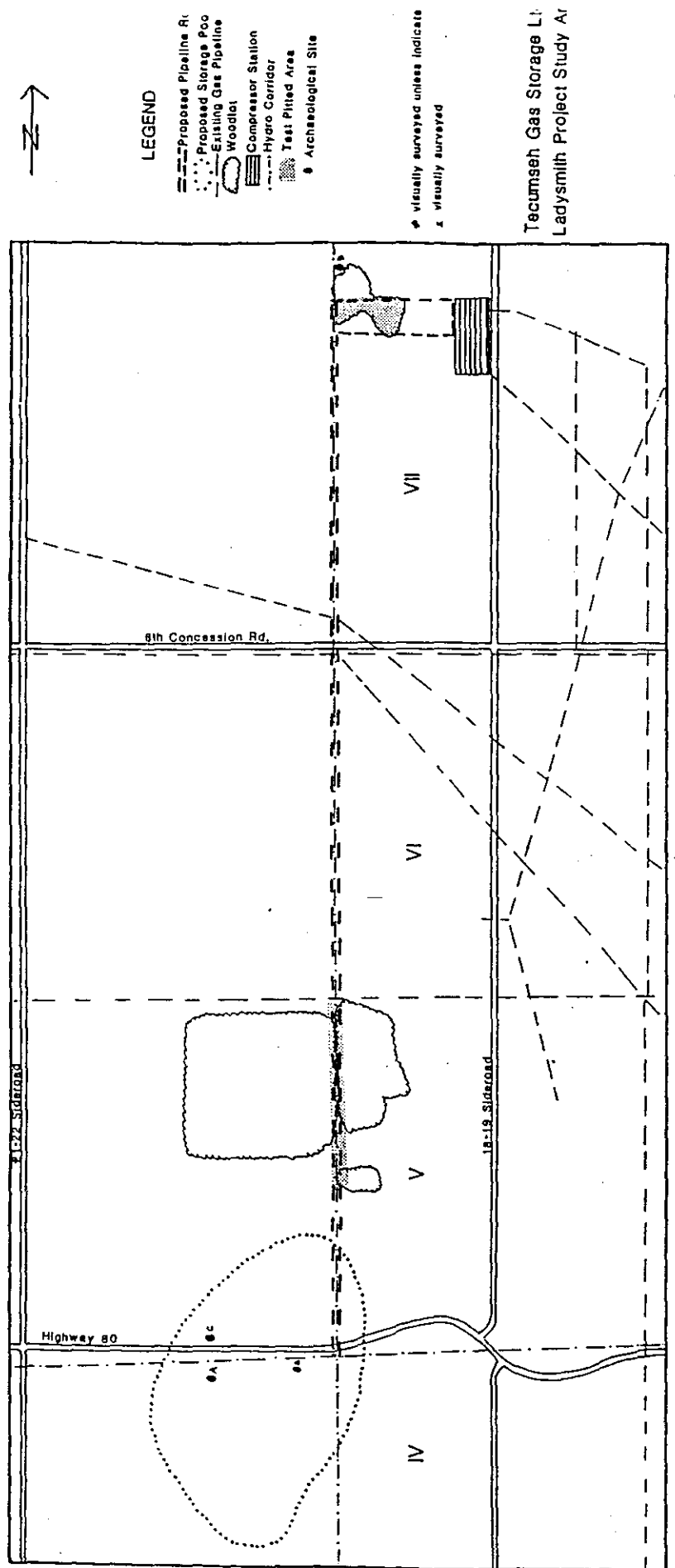


Figure 3

Appendix One

CULTURAL CHRONOLOGY FOR SOUTH WESTERN ONTARIO

| <u>Period</u> | <u>Group</u> | <u>Time Range</u> | <u>Comment</u> |
|---------------|-----------------------------|---------------------|---|
| PALEO-INDIAN | | | |
| | Fluted | 9500 - 8500 B.C. | Big Game hunters; small, nomadic groups |
| | Hi-Lo | 8500 - 8000 B.C. | |
| ARCHAIC | | | |
| Early | Side-notched | 8000 - 7700 B.C. | Nomadic hunters and gatherers |
| | Corner-notched | 7700 - 6900 B.C. | |
| Middle | Bifurcate Points | 6900 - 6000 B.C. | Transition to territorial settlements |
| | Stemmed Points | 6000 - 3500 B.C. | |
| | Notched Points | 3500 - 2500 B.C. | |
| WOODLAND | | | |
| Early | Meadowood | 900 - 400 B.C. | Introduction of pottery |
| Middle | Adena | 400 B.C. - A.D. 1 | |
| | Couture/ Riviere au Vase | 300 B.C. - A.D. 500 | Incipient horticulture Transition to village life and agriculture |
| | Riviere au Vase | A.D. 500 - 900 | |
| Late | Younge | A.D. 900 - 1300 | Establishment of large palisaded villages Tribal differentiation and warfare |
| | Springwells | A.D. 1300 - 1400 | |
| | Wolf | A.D. 1400 - 1650 | |
| HISTORIC | | | |
| Early | Historic Native | A.D. 1700 - 1875 | Tribal displacements |
| Late | Euro-Canadian | A.D. 1800 - present | European settlement |

(From: Janusas 1991; Murphy and Ferris 1990:196; Spence et al 1990:144)

Appendix Two

Artifact Registry

Tecumseh A (AeHo-19) Surface Remains

| <u>Artifact Number</u> | <u>Quantity</u> | <u>Class</u> | <u>Comments</u> |
|------------------------|-----------------|--------------------------------|------------------------|
| 1-5 | 5 | clear bottle glass | 1 pressed crystal |
| 6 | 1 | green bottle glass | base="HAM..." |
| 7 | 1 | brown bottle glass | top; seamless lip |
| 8 | 1 | blue bottle glass | top; applied lip |
| 9-12 | 4 | purple bottle glass | 2 tops; 1 seamless |
| 13 | 1 | melted glass | |
| 14-15 | 2 | glass fuses | CGE & FILE brands |
| 16 | 1 | glass marble | all blue |
| 17-19 | 3 | press green milk glass | 1 base |
| 20-24 | 5 | white ironstone | 3 edges |
| 25 | 1 | white ironstone (Seashells) | edge |
| 26-27 | 2 | white earthenware | 1 edge |
| 28-29 | 2 | white milk glass | 1 rim |
| 30 | 1 | banded white ironstone | green & orange stripes |
| 31 | 1 | lustreware | edge |
| 32 | 1 | multi-coloured stoneware | figural |
| 33 | 1 | orange glazed earthenware | |
| 34 | 1 | St. Johns ware | edge |
| 35 | 1 | red printed earthenware | |
| 36-39 | 4 | blue willow ware | 1 base |
| 40-42 | 3 | dark green printed earthenware | 1 handle; 1 edge |
| 43 | 1 | brown glazed red earthenware | lid edge |
| 44 | 1 | coal | |
| 45-46 | 2 | bullet casings | .32 centre fire |

Appendix F

1993 Environmental Assessment

TECUMSEH GAS STORAGE

LADYSMITH POOL NPS 14 PIPELINE

ROUTE SELECTION/ENVIRONMENTAL ASSESSMENT

AND

STORAGE POOL ENVIRONMENTAL

MANAGEMENT PLAN

GP066/98296
Revised edition
October, 1993

Date: *93/10/14*



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PART A - STORAGE POOL ENVIRONMENTAL MANAGEMENT PLAN

1. INTRODUCTION

1.1 Background

Tecumseh Gas Storage (TGS), a division of The Consumers Gas Company Limited operates six underground natural gas storage reservoirs, all located near Sarnia in southwestern Ontario. Natural gas transported from western Canada through natural gas transmission facilities owned by TransCanada PipeLines Limited is injected into these reservoirs for storage during periods of low demand (summer months) and withdrawn during periods of high demand (winter season) to supplement the supply required in the Ontario market.

Ecological Services for Planning Ltd. (ESP) was retained by TGS to prepare a Route Selection/Environmental Assessment (EA) for the proposed transmission pipeline and an Environmental Management Plan for well drilling, access road development and construction of the pipeline gathering system associated with the Ladysmith Storage Pool development. This report describes the environmental features in the study area (Part A), compares alternate pipeline routes, and selects the preferred route between the Ladysmith Storage Pool and the TGS Compressor Station (Part B). In addition, this report outlines preferred locations for access roads to the injection/withdrawal wells, handling, storage and disposal methods for drill slurry, and locations for the pipeline gathering system from the wells (Part C). Part D of this report includes the Bibliography and Appendices. This report also specifies mitigation measures to be employed during construction to minimize environmental impacts.

1.2 Description and Purpose of the Storage Pool Development

TGS has acquired the storage and PN&G rights for the Ladysmith reservoir, approximately 57 ha in aerial extent, underlying Lots 19 through 21 in Concessions 4 & 5, Moore Township, Lambton County. It is proposed to develop this reservoir for natural gas storage service and add it to Tecumseh's network of reservoirs. Development of this storage reservoir will include the drilling of five (5) wells and the construction of an NPS 14 (356 mm), an NPS 8 (219.1 mm) pipeline field gathering system and access roads to the wells. Access roads to some of the existing wells are already in place but may require some modification.

An NPS 14 Pipeline is required to transport natural gas for injection or withdrawal between the Ladysmith storage pool and the TGS Compressor Station located at the north part of Lot 19, Concession 7, Moore Township, Lambton County.

It is proposed that development of the Ladysmith storage pool will commence in May, 1994. Construction of the proposed NPS 14 pipeline will require 10 m of permanent easement and 10 m of temporary easement.

1.3 Regulatory Requirements

TGS is regulated by the Ontario Energy Board (OEB) which has the authority to grant approval for the installation of pipeline transmission facilities and gas storage pool development. As a regulatory body, the OEB ensures that proponents meet all standards and regulations relating to both the protection of the environment and public safety.

1.3.1 Proposed Ladysmith Storage Pool Pipeline

In order to construct pipeline transmission facilities, TGS must submit an application to the OEB which includes the following:

- ♦ project cost and an economic justification for the project;
- ♦ engineering design and construction plans for the proposed facilities; and
- ♦ an environmental impact assessment report.

A public hearing is held to review the application and provide a forum for comments from interested parties. The OEB gives advance notice of the hearing date, and directs the applicant to place advertisements in local newspapers and serve notice on affected landowners.

Following the hearing, the OEB may approve construction of the facility. Approval is granted based on whether the proposal is in the "public interest". When granting approval for facilities, the OEB often attaches conditions with which the applicant must comply. These conditions frequently reflect environmental and landowner concerns.

The EA must be prepared in accordance with the OEB publication entitled, "Environmental Guidelines for Locating, Constructing and Operating Hydrocarbon Pipelines in Ontario," (1989) Third Edition, subsequently referred to as "the Guidelines".

The Guidelines place emphasis on public and landowner participation in the environmental planning process. During this project, this emphasis was reflected in landowner, public and agency input through meetings held on two separate occasions, correspondence and a landowner survey program.

The EA for each pipeline application is reviewed by a committee chaired by a representative of the OEB, namely the Ontario Pipeline Coordination Committee (the OPCC). The Committee is comprised of the following Ontario Government Ministries concerned with the construction and operation of pipeline facilities:

- ♦ Ministry of Agriculture and Food;
- ♦ Ministry of Consumer and Commercial Relations;
- ♦ Ministry of Culture and Communications;
- ♦ Ministry of the Environment and Energy;
- ♦ Ministry of Government Services;
- ♦ Ministry of Housing;
- ♦ Ministry of Municipal Affairs;
- ♦ Ministry of Natural Resources; and
- ♦ Ministry of Transportation.

The OPCC completed its review of this report in August, 1993. No outstanding issues were identified by the member ministries; a copy of all OPCC correspondence is included in Appendix B.

In addition, the Report is reviewed by affected Municipalities, Conservation Authorities, special interest groups and landowners.

1.3.2 Proposed Storage Pool Development

The OEB also has the authority to recommend the designation of gas storage areas and permit the injection of gas into a geological formation for the purpose of storage. Gas storage agreements are also under the purview of the OEB with respect to the parties to the agreement and the renewal period.

The OEB is also responsible for the authorization to inject, store and remove gas from a designated storage area. The OEB may also regulate the joining of interests (unitization) within a storage pool for the purpose of apportioning costs and benefits.

Applications for Permits to bore, drill or deepen wells in a designated storage area are under the jurisdiction of the Minister of Natural Resources. However, these applications are referred to the OEB for a decision, with or without a hearing, depending on the special circumstances of the applications and whether the applicant has authority to store gas in the area.

The OEB public hearing process offers interested parties an opportunity to express any concerns they have with regard to the storage pool development. The OEB, in the hearing process, routinely considers the economics, technical plans, safety concerns and environmental issues related to storage pool development. As with transmission pipeline applications, the OEB gives advance notice of the hearing date and directs applicants to place newspaper advertisements and serve notice of the application on affected landowners.

1.4 Report Organization

This report is divided into four main parts. Part A provides an overview of the proposed pipeline and storage pool development. Part A also includes an introduction which is followed by: an outline of the study process (Section 2); and a description of the environmental features within the study area (Section 3).

Part B includes information specific to the proposed Ladysmith storage pool pipeline. Included in Part B is a description of the route selection process and related public input regarding the selection of a preferred route (Section 4). The findings of the detailed environmental assessment and mitigation recommendations along the preferred route (Section 5); and monitoring recommendations (Section 6) are also included in Part B.

Part C of this report discusses the specifics of well and access road locations associated with the development of the proposed Ladysmith storage pool. In Part C, the well and road locations are addressed in Section 7; the findings of the detailed environmental assessment and mitigation measures for the storage pool development are addressed in Section 8; and monitoring recommendations for the storage pool development are discussed in Section 9.

Part D includes the bibliography and appendices.

1.5 Construction Schedule

The schedule for construction of the proposed Ladysmith Transmission pipeline and drilling of the proposed wells are as listed below.

- ♦ Summer 1994 (construction season commencing in May)
 - Ladysmith Pool Transmission Pipeline
 - Drilling of wells TL-1, TL-2, and TL-3
- ♦ Winter 1995 (construction season commencing in January)
 - Drilling of wells TL-4 and TL-5

2. STUDY PROCESS

2.1 Study Methodology

It should be emphasized that the study process outlined on Figure 1 represents the development of the Environmental Assessment and Management Plan (EAMP). By its very nature, environmental assessment is an iterative process. Consequently, minor changes to routes, access road locations, well sites and mitigation measures are possible as a result of review of the report by interested parties, landowner negotiations and the availability of new environmental information in the study area.

The underlying principle in developing the EAMP was to solicit the input of landowners in the study area at the commencement of the study and throughout the development of environmental features, alternate routes, access road locations and well sites. Government agencies, the public and landowners were also invited to a public meeting to comment on the location of alternate routes, evaluation criteria and preferred route selection.

2.2 Study Area

The location of the study area is shown on Map 1. The boundaries were primarily determined in the north by the Tecumseh Gas Storage Compressor Station located at the north part of Lot 19, Concession 7, Moore Township and in the south by the south part of the Ladysmith Storage Pool reservoir underlying Lots 19 through 21 in Concessions 4 & 5, Moore Township.

The relatively short distance of the proposed Ladysmith Pool Pipeline dictated that the eastern and western study areas boundaries could be aligned with nearby Township roads. The eastern boundary follows the lot line between Lots 16 and 17 while the western boundary follows Moore 21-22 Sideroad.

2.3 Public Participation

An important and accepted principle of sound environmental planning is public participation. This study included the participation of government agencies, special interest groups, the public and potentially affected landowners.

2.3.1 Agency Contacts

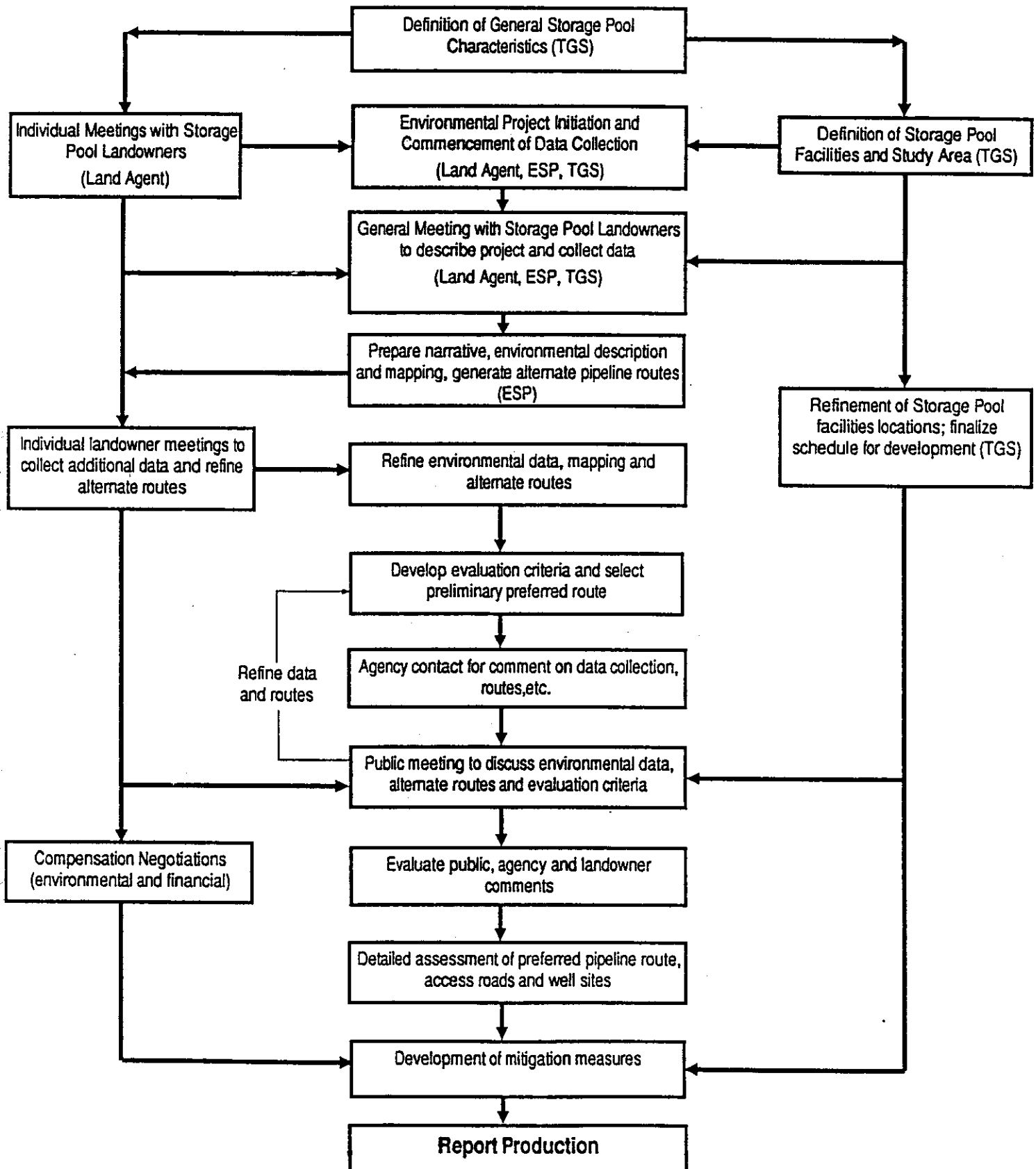
A number of agencies, authorities and interest groups were given an opportunity to comment on the study during a public Information Open House, held on October 27, 1992.

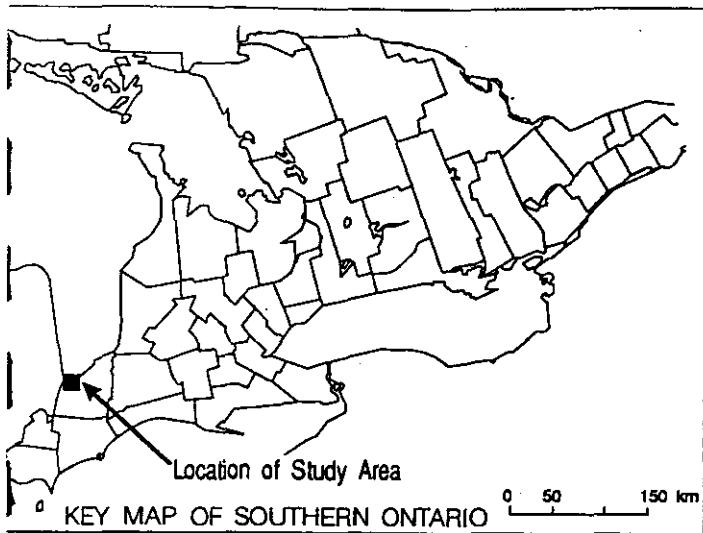
Initial agency contact included a letter which outlined the project along with a description of the proposed alternative routes. A map of the study area was also included in this letter. A list of agency/groups contacted and associated responses is provided in Appendix B.

2.3.2 Landowner and Public Meetings

Two meetings (September 14, 1992 and October 27, 1992) were held to facilitate landowners and public input respectively on the proposed TGS Pool and Ladysmith connecting pipeline development project.

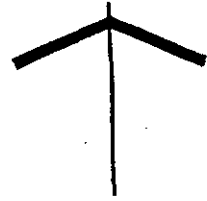
Figure 1
Study Process
Ladysmith Storage Pool Development
Environmental Assessment and Management Plan (EAMP)



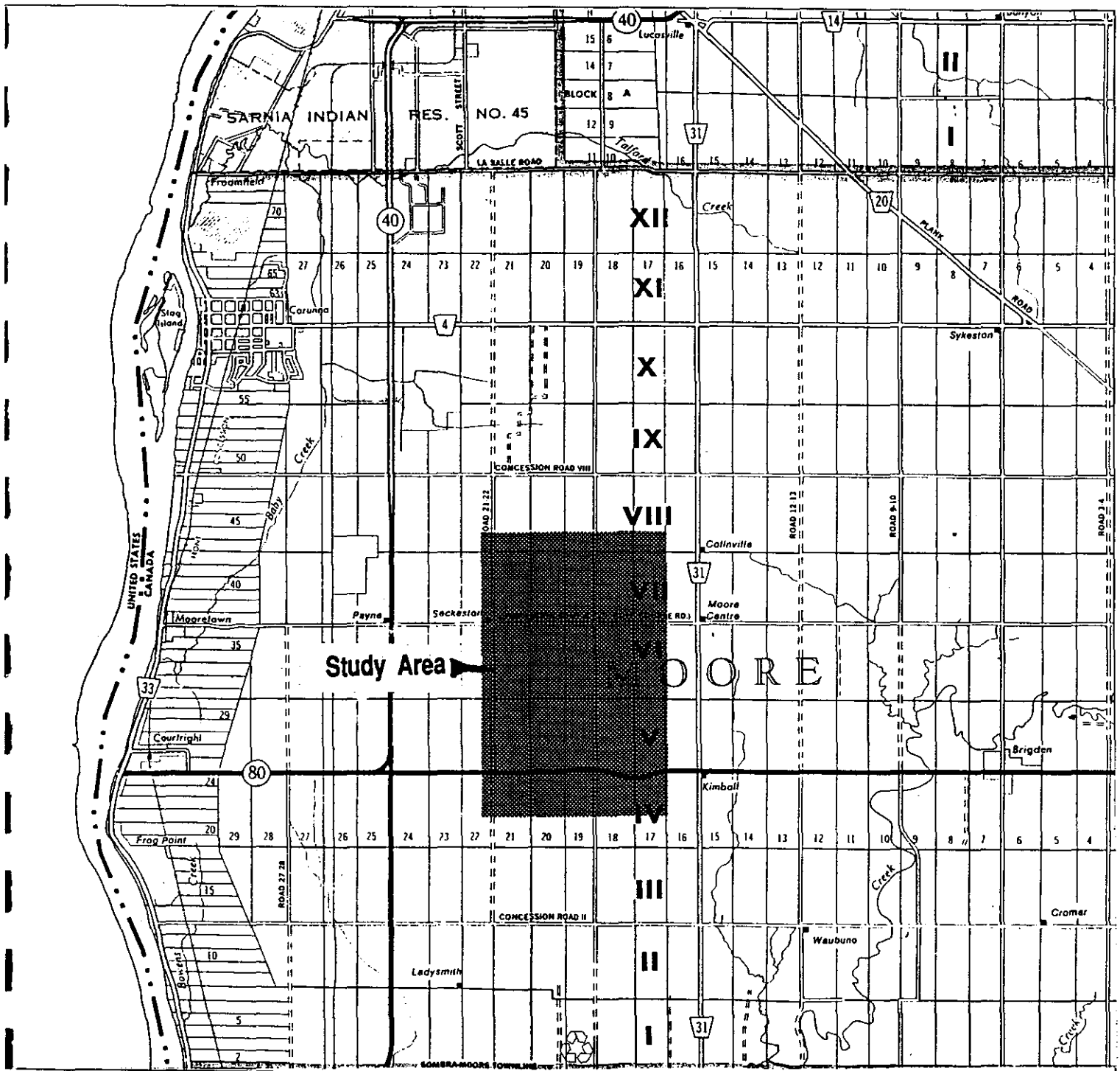


Map 1 Location of Study Area

Project No. GP066
Nov., 1992



0 2 km
Scale 1:100,000



The September 14, 1992 landowner meeting was held at the offices of TGS. The purpose of this meeting was to discuss the proposed unitization of the landowner royalty interests in the Ladysmith Pool and to provide information regarding TGS's plan to develop the Pool for natural gas storage. Invitations to this meeting were sent out to the individual landowners within the proposed storage pool area.

The October 27, 1992 public meeting was held at the Moore Centre in Moore Township. A letter and map was sent to government agencies inviting them to attend the meeting. The letter summarized the data collected, proposed alternate routes, presented evaluation methodology and provided a description of a preliminary preferred route.

The Mayor of Moore Township, Mrs. Jane Marsh, the Township Clerk and Treasurer, Mr. Ron Whitman, and fourteen landowners were present at this meeting. Displays for this meeting included a 1:5,000 colour aerial photograph of the study area with the alternate routes and landowner properties identified. A map depicting environmental features and alternate and preferred pipeline routes was also displayed. This map detailed drainage systems, woodlots, municipal drains, and roadways located in the study area. A copy of this map is included in Appendix A. TGS and ESP staff were available to provide information and answer questions. An exit questionnaire was distributed at the conclusion of the meeting. A sample questionnaire is included in Appendix C.

Meetings were also held on February 12 and February 17 with landowners located in the designated storage area. During these meetings the location and orientation of permanent access roads were discussed. The proposed locations of the access roads, as discussed with the landowners, are indicated on Photomosaic 4, Appendix E. The final access road locations will be determined with the landowners prior to construction.

2.3.3 Landowner Survey

In October, 1992 a personal survey of the landowners along each alternate route was undertaken by ESP and a land agent employed by TGS. The purpose of this survey was to provide potentially affected landowners the opportunity to comment on:

- ♦ specific environmental features;
- ♦ heritage resources;
- ♦ future land development plans;
- ♦ preference for alternate routes; and
- ♦ previous construction experience, if applicable.

A summary of landowner concerns is provided in Section 4.2. A list of landowners surveyed, and a copy of the landowner survey form is included in Appendix C.

3. ENVIRONMENTAL SETTING

Map 2 (Appendix A) highlights the environmental features found in the Study area. The following sections describe these features.

3.1 Physical Environment

3.1.1 Physiography and Surficial Geology

The study area is located within the Lambton clay plain sub-unit of the physiographic unit known as the St. Clair clay plains. The St. Clair clay plains have little topographic relief, generally lying between 175 m and 210 m above sea level. There is a deep overburden of clay till often in excess of 40 m, which is underlain by black shale.

The Lambton clay plain is a bevelled till plain. It often has a thin veneer of lacustrine clay over the underlying till. Over extensive areas it has the faint knoll-and-sag relief, typical of ground moraine (Chapman and Putnam, 1984). Tile drainage is necessary for good crop growth and deep municipal drains have been excavated to facilitate the removal of excess water.

The surficial geology of the study area consists mainly of deep water glaciolacustrine deposits of clay with silt and some fine sand. However, the study area is located immediately south of an area consisting of clayey silt till (Fitzgerald, et.al., 1979). Therefore, some coarser till material may lie within the study area.

3.1.2 Mineral and Petroleum Resources

The study area is not considered to have any economic mineral resource potential nor are there any licensed sand and gravel pits in the area (K. Stemmler, pers. comm.). The clay till and its mode of deposition preclude any potential for mineral extraction.

The study area and surrounding area are well endowed with petroleum resources. The first producing oil well in North America was established in Oil Springs, approximately 15 km southeast of the study area. Natural gas was also produced early in the development of the oil resource and continues to be produced today. In 1988, Ontario produced 190,572.7 m³ (1.2 million barrels) of oil and 503.4 million m³ (17.8 bcf) of natural gas. In 1988, 20.7% of all oil and 11.4% of all natural gas produced in Ontario was extracted from Lambton County (MNR, 1992).

The most significant petroleum resources in the study area are the Kimball-Colinville Pool storage reservoir located in Lot 17, 18, 19 and 20, Concession V, VI and VII, Moore Township operated by TGS and the Payne Pool located in Lot 21, Concession VII, Moore Township, operated by Union Gas Ltd. These storage reservoirs are in a group of many former gas pools in Lambton County that are used to store natural gas during low-demand "off-peak" seasons. These pools supply stored gas during periods of peak demand in the late fall and winter seasons. Natural gas storage reservoirs in the area are located in formations at depths that exceed 600 m.

3.1.3 Agriculture and Soils

The Ontario Food Land Guidelines are a statement of government policy intended to assist local planning for agriculture. The Guidelines outline ways to identify agricultural resource lands and locate lands of highest priority to agriculture. These principles of the Food Land Guidelines are addressed in this section and also in Section 4.5 of this report.

Agricultural land use in the study area is primarily field crops including corn and soybeans. Continuous row cropping systems are most common, followed by grain and hay cropping (OMAF, 1983).

Artificial drainage of the study area is extensive. Most of the cleared land is artificially drained; only the wooded areas and municipal roads are not tile drained (16%). Random tile drainage is the most common system (62%) while systematic tile drainage (22%) is identified in only six of the fifty tile-drained properties in the study area.

Agricultural capability in the study area is high. The entire study area is classified as either Class 2 or Class 3 capability for agriculture. Class 2 lands, limited by wetness (w), occupy 14.7% of the study area. The remaining 85.3% is Class 3 and is limited by undesirable soil structure and permeability (d). Artificial drainage systems are illustrated on Map 2 (Appendix A).

Soils in the study area are quite uniform, as a result of their glaciolacustrine origin. Parent materials in the study area are glaciolacustrine clays and clay tills. Clay loam is the most common soil texture encountered. Brookston clay and Caistor clay loam are the only soil series mapped in the study area and represent the Class 2 and Class 3 agricultural capability classes respectively. The location of soil series in the study area are illustrated on Map 2 (Appendix A).

Brookston clays are limited by drainage; however, when artificial drainage systems are installed, the moderate climate of the area allows a wide variety of crops to be grown on this soil. Topsoil depth varies between 25 cm and 35 cm and is clay in texture (Matthews *et.al.*, 1957). Distinct colour differences between the topsoil and subsoil horizons are apparent. As a result of the poor drainage, the subsoil is invariably compact with heavy mottling and gleying frequently occurring at depths of 30 to 40 cm.

Caistor clays are limited by undesirable soil structure and permeability (d) and are imperfectly drained. These clays are found on more gently sloping locations and are characterized by their shale content and slight stoniness. Woodlots and pastures are often located on Caistor clay in Moore Township.

3.2 Biological Environment

3.2.1 Surface Water Hydrology and Fisheries

Water quality and fisheries data were obtained through discussions with the Ontario Ministry of Natural Resources (OMNR), Chatham District staff (1992), and a review of related background documents. Municipal drains recorded by the Ministry of Agriculture and Food are described below and illustrated on Map 2 (Appendix A).

No streams or creeks are located within the Ladysmith study area. Several municipal drains surrounding and located within the study are the only means for the removal of standing water from the land. The Jarvis Drain and the Coyle Drain accept the greatest volumes of runoff in the study area. Both drains are oriented in a north/south direction through the study area.

The Jarvis Drain is located adjacent to Moore Sideroad 18-19 near the eastern edge of the study area boundary. The Laur Drain, the Long Drain, and the Ford Drain located in the centre portion of the study area outlet to the Jarvis Drain. The Laur Drain is located in the centre of the north portion of the study area, running in an easterly direction into the Jarvis Drain. This drain is situated along the south limit of Lot 19, Concession VIII, Moore Township and is oriented in an east/west direction. The Long Drain is located in the centre of the study area along the south limit of Lot 19, Concession VII, Moore Township adjacent to the north side of Moore Road 6. The Long Drain flows in an easterly direction into the Jarvis Drain. The Ford Drain is located in the centre of the southern portion of the study area. This drain is situated along the south lot line of Lot 19, Concession V, Moore Township and runs in an eastern direction into the Jarvis Drain.

The Lloyd Smith Drain, the Eyre Drain, the Taggart Drain, and the McDonald Drain provide drainage for the eastern third of the study area. Each of these drains flow west from the eastern study area boundary into the Jarvis Drain.

The Lloyd Smith Drain travels east-west across the northeastern corner of the study area from the centre of Lot 18. This drain is situated along the southern limit of Lot 18, Concession VIII, Moore Township. The Eyre Drain flows west from the eastern study area boundary into the Jarvis Drain. The Eyre Drain is situated along the north half of Moore Road 6 in the south half of Lot 18, Concession VII, Moore Township. The Taggart Drain also flows west from the eastern study area boundary into the Jarvis Drain. This drain is situated near the northern lot line of Lot 18, Concession V, Moore Township. The McDonald Drain travels west along the north limit of an easement shared by a Ministry of Environment 10" water pipeline and Ontario Hydro. The McDonald Drain is situated in the south half of Lot 18, Concession V, Moore Township and flows west into the Jarvis Drain.

The Coyle Drain crosses the western edge of the study area in a north/south direction. This drain is situated parallel, and adjacent to, the eastern edge of Moore Sideroad 21-22. Four municipal drains in the study area flow into the Coyle Drain. These drains include the Cruickshank Drain, the Arnold Drain, the Trapp Drain, and the Nicholson Drain. Each of these drains collect excess runoff from the western half of the study area and eventually flow into the Coyle Drain.

The Cruickshank Drain drains the northwestern portion of the study area. This drain is situated along the southern limit of Lots 21 and 22, Concession VIII, Moore Township and flows into the Coyle Drain. Another drain which flows west into the Coyle Drain is the Arnold Drain. The Arnold Drain is located adjacent to the north side of Moore Road 6 in the south half of Lots 20 and 21, Concession VII, Moore Township. The Trapp Drain also flows west through lots 20 and 21. The Trapp Drain is situated south of the lot line between Concessions V and VI. Finally, the Nicholson Drain provides drainage for the southwestern portion of the study area. This drain is situated near the north side of Highway 80 in the south half of Lots 20 and 21, Concession V, Moore Township.

Communication with OMNR personnel in the Chatham District office indicated a low probability of sensitive fisheries habitat occurring within these municipal drains. The Township of Moore recognizes municipal drains as a major concern, due to clay soils and flat topography. Standards to guide municipal drain construction and rehabilitation have been established by Moore Township.

3.2.2 Terrestrial Environment

Vegetation

Vegetation and wildlife resources in the study area were documented through discussions with OMNR staff and through a review of pertinent background mapping and reports. The study area encompasses an area of approximately 1285 hectares (ha) and contains a number of woodlots, ranging in size from approximately 0.17 ha to 29.32 ha. The location of woodlots and hedgerows in the study area are illustrated on Map 2 (Appendix A). Forest cover for Moore Township occupies a small percentage of the total land area. These woodlots appear to be concentrated along back lot lines and along steep topography adjacent to streams. Only about 7% of Lambton County as a whole is occupied by forest cover, with hardwoods being the predominant forest type.

Lambton County is situated within the Niagara Section of the Deciduous Forest Region. Very favourable soil and climatic conditions provide for the extension of many trees and other plants which form part of the deciduous forest south of the Great Lakes into this area of Ontario.

The forest communities are dominated by broadleaved trees. The characteristic association, common in part to both the Great Lakes-St. Lawrence and the Deciduous Forest Regions, consist primarily of

beech and sugar maple, together with basswood, red maple, red oak, white oak and bur oak. Also found within this area is the main distribution in Canada of such species as black walnut, sycamore, swamp white oak and shagbark hickory, with the more widely distributed butternut, bitternut hickory, rock elm, silver maple and blue-beech.

Other species with a sporadic occurrence as scattered individuals or groups, either on specialized sites or within the characteristic forest types of the Region, include: tulip-tree, black cherry, mockernut and pignut hickories, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumbertree, pawpaw, Kentucky coffee-tree, red mulberry and sassafras. The chestnut, once common, was severely reduced in numbers by the Chestnut Bark Blight. Rare tree species which occur within Lambton County, and possibly within the study area, include, Pawpaw (*Asimina Tviloba*), Kentucky Coffee-tree (*Cymnocladus dioica*), Blue Ash (*Rvazinus quadrangulata*), and Chestnut (*Castanea dentata*).

The productive capacity and timber quality of the average woodlot in Lambton County has been greatly reduced by a general lack of management and a history of pasturing, overcutting and highgrading. The large number of individual landowners in the County, the small size and scattered distribution of woodlots, and the rapid clearing of forest cover inhibit effective forest resource management. Woodlot clearing continues to reduce the existing forest potential. From 1958 to 1978, forest cover decreased by 30 percent in Lambton County while reforestation was minimal.

The relatively small parcels of forested land have potential to provide significantly higher timber values per hectare compared to other areas of the province, due to higher rates of growth, better species quality and greater ease of forest management. Lambton County presently provides 69 percent of Essex, Kent and Lambtons' (Chatham District) forest products.

Wildlife

Six key areas of wildlife habitat are recognized in Chatham District, including Areas of Deer Concentration, Wetland Habitat, Waterfowl Habitat, Wildlife Management Areas, Waterfowl Rafting Areas (Fall Migration) and Endangered Species Habitat. None of these areas are designated within the study area by the OMNR (OMNR, 1992).

Woodlots in the study area provide prime habitat for white-tailed deer (*Odocoileus virginianus*). Other mammals common to southern Ontario are found in the study area as well. Some rare breeding birds are recorded for Lambton County, but these are marsh birds or waterfowl which are associated with wetland complexes of Lake St. Clair and Walpole Island.

Hunting of deer, small game and waterfowl are important recreational pursuits in Chatham District. In addition, the trapping of muskrat (*Ondatra zibethicus*) raccoon (*Procyon lotos*), fox (*Vulpes vulpes*), coyote (*Canis latrans*), beaver (*Castor canadensis*), mink (*Mustela vison*), skunk (*Mephitis mephitis*) and weasel (*Mustela* sp.) is common. Muskrats comprise 94 percent of all species trapped (OMNR, 1983).

Several of the wildlife management objectives of Chatham District include the conservation of all wildlife species on public and private lands and the perpetuation of diverse, high quality habitats. These objectives also include the identification of endangered, threatened or rare species and significant populations of wildlife species. Management of muskrat as the principal furbearer species and management of deer as an important big game species, including controlled hunting and protection of wintering areas are also identified as important objectives. Development is not permitted by the OMNR on or adjacent to habitat of rare or endangered species.

3.3 Cultural Environment

Archaeological and historical resources, as well as current Official Plans and Zoning By-laws, were reviewed to establish sensitive areas within the study area. The results of this review and inventory are depicted on Map 2 (Appendix A).

3.3.1 Rural and Residential Development

There are three municipal roads within the study area under the jurisdiction of Moore Township. Two of them are two lane - gravel roads and the third is a two lane - paved road. Highway 80 runs east-west through the south side of the study area and is under the jurisdiction of the Province of Ontario. Rural residences are located along each municipal road and the single provincial highway. These consist of a mix of farm and non-farm related residences.

3.3.2 Archaeological and Historical Resources

Archaeological Research Associates Limited (ARAL) were retained to conduct a literature review of recorded sites in the study area in order to identify routing constraint areas. Information for this search was collected at the Ministry of Citizenship and Culture archaeological site files in Toronto and published archaeological literature. This review revealed that there are no archaeological sites registered within the study area. The review completed the first stage of archaeological inventory. ARAL undertook a Stage Two assessment in November, 1992. Three archaeological sites were identified during the Stage Two assessment, their locations are identified on Map 2, Appendix A.

The Stage One and Stage Two Archaeological Assessments are included as Appendix D.

3.3.3 Land Use Planning and Municipal Features

Jurisdiction for land use planning is divided among two municipalities, namely Moore Township and the County of Lambton. The Official Plan (O.P.) and Zoning By-Laws of Moore Township were reviewed to identify designations or areas where pipeline routes would be compatible and/or incompatible with existing or planned future use and sensitive environmental features. The County of Lambton O.P. was reviewed to identify land use policy affecting pipelines. This O.P. is not intended to be a land use plan, but rather a policy plan which establishes general planning policies on matters of County or inter-municipal concern for the Lambton County Planning Area. The local municipalities (the Townships) have consequently been entrusted with the implementation of policies in the County O.P. This implementation is established through the Township O.P.'s and Zoning By-Laws.

The Official Plan of the Township recommends that new linear developments be located in existing corridors, along lot lines or in a manner that minimizes impacts on people, adjacent land uses and the natural environment. The study area within Moore Township is designated as Rural. This designation specifies agricultural and related land uses only.

A sanitary landfill, owned by the County of Lambton and operated by the Township of Moore, is located in the study area in the north half of Lot 21, Concession V, Moore Township. This sanitary landfill handles municipal household waste generated in Moore Township. Ownership of the site was transferred to the County of Lambton from Moore Township on January 1, 1991 under Bill 35 of the *Samia Lambton Act*.

In addition, Moore Township owns a 100 acre property adjacent to the existing landfill site. Mr. Ron Whitman, Moore Township clerk, indicated that the north half of Lot 20, Concession V, Moore Township is designated as a waste disposal site by the Township Official Plan. Currently this property is comprised of a woodlot and is not being utilized for sanitary landfill purposes.

Municipal potable water is available to each landowner located in the study area. Most landowners in the study area are on the municipal water supply however, several landowners still rely on ground water resources. Depth of water wells located in the study area range from 21 m to 45 m with an average depth of 35 m.

3.3.4 Existing Utility Corridors

The study area is criss-crossed by a variety of rights-of-way and easements. These are depicted on Map 2 (Appendix A).

There are two Ontario Hydro ROW's and easements in the study area. A 230 kV steel tower line runs parallel to, and just south of, Highway 80 for the width of the study area. A 115 kV steel tower line runs north-south through the middle of the study area. Wood pole distribution lines are located along most of the roads in the study area.

The Design and Development Division of Ontario Hydro has identified the 115 kV steel tower line as an alternative transmission line route for Bulk Transmission West of London. The study has gone to a preliminary hearing with the Joint Board and Ontario Hydro is awaiting a decision from the Board on whether to proceed with the project. The 115 kV steel tower line is not Ontario Hydro's preferred route for the Bulk Transmission Study (pers. comm., Ontario Hydro, Nov. 1992).

Natural gas pipelines in the study area are numerous. They are identified on Map 2 (Appendix A). The majority of the pipelines are associated with three storage pools in and around the study area. Telephone cables in the study area consist of underground and aerial facilities along road allowances. Three water pipelines cross the study area. The Ministry of Environment's 10" West Lambton Water Line, which supplies potable water to Brigden, parallels the Ontario Hydro right-of-way and a Moore Township 6" municipal service line parallels the south side of Moore Road 6. In addition, there is a 4" municipal service on the east side of Moore Road, 18-19.

PART B - LADYSMITH FIELD TRANSMISSION PIPELINE

4. PREFERRED ROUTE SELECTION

This phase of the study commenced with a review of the findings in Phase I and was followed by the generation of alternate routes. The process of selecting the preferred pipeline route is described in this section. The significant determinants of the preferred route were impacts on environmental features and landowner preferences.

4.1 Alternate Route Generation

Upon review of the data collected significant findings within the study area included:

- ♦ uniformity of poorly drained soils;
- ♦ importance of the extensive system of private and public artificial drainage;
- ♦ Moore Township emphasis on routing parallel to existing man-made linear features;
- ♦ limited vegetation (% cover);
- ♦ absence of high fisheries potential;
- ♦ importance of petroleum resources to local economy; and
- ♦ extensive network of hydro transmission lines and oil, gas and water pipelines.

Based on these significant findings, four alternate routes were identified. Each route would, for its entirety, parallel an existing linear feature. These routes included combinations of Hwy 80, Moore Township Rds. 21-22, 18-19, a Hydro transmission line and a lot line. The alternate routes are described below and identified on Map 2 (Appendix A).

Once a preliminary map of features and alternate routes had been prepared a landowner survey along the four alternate routes was conducted. The survey assisted the study team in refining environmental features and comparing alternate routes. The results of the survey are described in Section 4.2.

Alternate Route A

Alternate Route A, starts at the point where a north-south oriented 115 kV steel tower transmission line crosses Highway 80. Route A runs west along the south side of Highway 80 to Moore Sideroad (SR) 21-22. At this point, Route A turns north and parallels SR 21-22 to the north limit of Concession VII before turning east. The route then parallels the Cruikshank and Laur Drains east to the TGS Compressor Station. Route A is 6.7 km in length.

Alternate Route B

Alternate Route B, starting at the same point on Highway 80 as Route A, parallels an existing Ontario Hydro easement and an existing Union Gas easement northwards to the north limit of Concession VII. It then turns east parallel to the south side of the north limit of Concession VII to the TGS Compressor Station. The total length of Route B is 4.5 km, 57% of Route B parallels existing pipeline easements.

Alternate Route C

Alternate Route C, starts at the same point on Highway 80 as Route A and parallels Highway 80 along the south side in an easterly direction to SR 18-19. It then turns north and parallels the east side of SR 18-19 to the TGS Compressor Station. Route C is 4.5 km long.

Alternate Route D

Alternate Route D starts at the same point on Highway 80 as Route A and heads due east along Highway 80 to the Wilkesport pipeline easement. It then parallels the easement on the west side to a point in Lot 18, Concession VII and then turns west to the TGS Compressor Station. The total length of Route D is 5.4 km, 78% of Route D parallels the existing Wilkesport pipeline easement.

4.2 Landowner Survey Summary

Landowner surveys were conducted in October, 1992 by ESP and a land agent employed by TGS. Twenty-seven landowners on the four alternate routes were interviewed. Landowners commented on the environmental features mapping and on alternate route preferences. Their comments on features were mainly related to locations of drainage systems, individual drains and specific features on their property. Their preferences for alternate routes are summarized below. Nine of the twenty-seven landowners interviewed did not have a preference among the four alternate routes.

Alternate Route A

Route A is the third choice of landowners (1). In addition, Bluewater Broadcasting (Lot 21, Conc. VI) indicated that a buried steel pipeline located at the front of their property would have a significant negative affect on tower transmission patterns. Route A would impact 13 landowners.

Alternate Route B

Route B is most preferred by landowners (12). In addition, Mr. A. Eyre indicated that a good location to place the pipeline on his property exists between two existing drainage tile beds. Mr. R. Young contacted TGS and indicated he preferred the west side of the Ontario Hydro easement. Mr. Young indicated that an alignment along the east side of Route B would impact a mature woodlot (W2) at the western edge of his property. Route B would impact 7 landowners.

Alternate Route C

Route C is the fourth choice among landowners (0). A significant deviation around a house and a church would be required on the corner of Mr. E. Robbins property, located at Moore Road 6 and SR 18-19. Route C would impact 5 landowners. However, at least two more landowners would be affected on the deviation around the church and house.

Alternate Route D

Route D is the second choice among landowners (4). It may however, interfere with future plans for a home on Mr. J. Eyre's property. Route D would impact 8 landowners.

4.3 Preferred Route Selection

The preferred route was selected based on a quantitative prediction (areas, numbers and length) of environmental impacts of pipeline construction on each alternate route and consideration of landowner preferences. The advantages and disadvantages of each route are summarized on Table 1 and in the accompanying alternate route descriptions.

Once the features impacted and route preferences were measured (Table 1), the numbers were closely scrutinized to appreciate the differences among the routes. It quickly became apparent that the

environmental uniformity of the study area influences the extent of potential impacts in direct relation to the length of the route chosen. Consequently, the shorter routes have a lesser environmental impact. The longer routes impact a greater area or number of features.

Table 1. Alternate Route Potential Impacts

| Features Impacted and Route Preference | A (eastside) | B (westside) | C (eastside then west) | D (westside) |
|--|-----------------|-----------------|------------------------------|-----------------|
| Artificial Drainage | 8.3 ha | 6.5 ha | 8.8 ha | 10.5 ha |
| Class 2 Agricultural Land | 1.9 ha | 1.9 ha | 1.1 ha | 1.8 ha |
| Class 3 Agricultural Land | 11.5 ha | 7.0 ha | 7.9 ha | 8.9 ha |
| Woodlots | 3.3 ha | 1.1 ha | 0.0 ha | 0.0 ha |
| No. of Municipal Drain Crossings | 3 | 2 | 5 | 4 |
| No. of Road Crossings | 2 | 2 | 3 | 3 |
| No. of Buried Pipeline Crossings | 8 | 4 | 5 | 5 |
| Landowners Affected | 13 | 7 | 5 * | 8 |
| Landowner Preference | 1 | 12 | 0 | 5 |
| Total Area Impacted (Length x 20 m easement) | 13.4 ha | 8.90 ha | 9.0 ha | 10.7 ha |

Shaded area indicates lowest impact

* Route C would affect at least 2 more landowners at the Moore Road 6 deviation

The shaded boxes in Table 1 identify the route with the least impact on each specific feature. Route B clearly stands out as the route of least impact in seven categories, namely:

- ♦ artificial drainage;
- ♦ Class 3 agricultural land;
- ♦ number of municipal drain crossings;
- ♦ number of road crossings;
- ♦ number of buried utility crossings;
- ♦ landowners affected; and
- ♦ total area.

Route B was preferred by a large majority of landowners with a stated preference. In addition, Route B does not conflict with any principles stated in the Ontario Ministry of Agriculture and Food's Food Land Guidelines (1978). For these reasons, Route B was chosen as the preferred route.

4.4 Preferred Route Location

The Route B location should be considered as fixed at its south end, just north of Highway 80. In particular, in order to avoid the newly installed systematic drainage system in the south half of Lot 19, Concession V and the woodlot in the north half of the same lot, the pipeline should be placed on the west side of the Hydro easement. This will avoid disruption to the systematic drainage system and removal of mature trees in the woodlot. In addition, there is an opportunity to route the pipeline between two north-south oriented tiles in the south half of Lot 20, Concession V. The specific locations of these tiles should be discussed with the landowner prior to construction.

In Concessions VI and VII there is no environmental preference for either the east or west side of the Hydro easement. However, landowners should be re-contacted prior to construction whichever side of the Hydro easement is finally chosen.

5. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES FOR THE PROPOSED LADYSMITH STORAGE POOL PIPELINE

Section 5 provides detailed information concerning environmental features affected by the preferred route. This section also recommends mitigation measures to reduce potential environmental impacts. Unavoidable impact to environmental features can be reduced by following the recommendations stated in this report and by implementing TGS's Pipeline Construction Specifications during construction (Appendix G). Environmental features and recommended mitigation measures are outlined in Section 5 and illustrated on Photomosaics 1-3 (Appendix E).

Environmental features which occur in the study area and along the preferred route were identified, and evaluated, using published and unpublished data sources. In November of 1992, ESP conducted a field survey to identify any other features along the preferred route and further refine the previously collected data.

5.1 Physical Environment

5.1.1 Soils and Agriculture

Soils information was obtained from the Soil Survey Report for Lambton County. This information was refined during the field survey and assessment. The Soil Survey Report and field assessment were used to identify and determine soil types which occur along the preferred route. During the field assessment information regarding soil type, topsoil depth, soil drainage characteristics and the potential for erosion was collected. Erosion potential was determined by the presence of any slope situated along the preferred route greater than or equal to 10%. No steep slopes were identified along the preferred route with the exception of the banks of each municipal drain.

Soils along the preferred route are quite uniform as a result of their glaciolacustrine origin. Brookston clay and Caistor clay loam are the only soil series encountered along the route. Both of these soil series have a clay or clay loam texture.

Brookston clay soils along the preferred route are classified as poorly drained; Caistor clay loam soils are imperfectly drained. The predominance of poorly and imperfectly drained soil profiles along the route is indicative of the texture of soils in this area of Lambton County. The preferred route crosses Brookston clays for approximately 20% of its length, the remaining 80% is made up of Caistor clay loam.

Total relief over the preferred route never exceeds 15 m. No steep slopes (ie >10%) are encountered. Depth to bedrock was not identified as a constraint in this area due to the deep overburden of clay, often in excess of 40 m.

Soil

a) Potential Impacts

The depth of topsoil was confirmed in November of 1992 during the detailed field assessment of the preferred route. Topsoil depth was confirmed to be uniform at an approximate depth of 25 cm across all agricultural lands. This depth decreases to approximately 20 cm in woodlots 1 and 3. The preferred route does not cross any areas of organic soils.

Potential impacts of pipeline construction on soils include the mixing of topsoil and subsoil, compaction and surface erosion. During saturated soil conditions the poorly and imperfectly drained clay loam soils are susceptible to compaction and rutting and have a high potential for damage.

b) Mitigation

Throughout the entire length of the preferred route, with the exception of woodlot 1 and woodlot 3, topsoil should be stripped and stockpiled separately from subsoil (refer to Figure 93-TP.4.2-A in Appendix G). Compaction of subsoil on the working area will be reduced by not removing topsoil across the entire easement. During stripping, topsoil depths recorded on the photomosaics (Appendix E), should be used as a guide to determine the depth of topsoil to be removed. This information should be confirmed by an Environmental Inspector during construction.

Topsoil should not be stripped through woodlots 1 and 3. Stump removal and topsoil stripping in woodlots is not recommended as it requires more space for topsoil storage and therefore more vegetation removal creates unnecessary disturbance and may inhibit natural vegetation from "suckering". In addition to the recommendations outlined above, the implementation of Tecumseh Gas Pipeline Construction Specification 93-TP.4 should minimize potential impact to agricultural lands.

During wet soil conditions, construction activities should be suspended to avoid compaction and potential topsoil/subsoil mixing problems as recommended in TGS's wet-soil shutdown policy.

5.1.2 Random and Systematic Artificial Drainage

a) Potential Impacts

Existing artificial drainage mapping and discussions with landowners revealed that approximately 3.25 km of the preferred route crosses artificially drained lands. This represents approximately 73% of the length of the preferred route. Temporary or permanent disruption of water flow and the movement of vehicles on wet soils are two pipeline construction activities which could result in crop loss due to flooding and soil erosion. Movement of vehicles across or along the easement during saturated soil conditions causes rutting which may result in damage to tile drainage systems (crushing). Faulty tile repair and construction during wet soil conditions could also result in significant crop loss due to improper drainage of artificially drained fields.

b) Mitigation

Prior to construction, landowners should be contacted to determine the location of existing tile drains and to discuss future plans for tile drainage. In order to accommodate existing and planned tile drainage, the pipeline should be installed at a sufficient depth below the tile to avoid interference with their operation.

Tile drains which are severed during trenching should be recorded and flagged. If a main header tile, or a tile which handles large volumes of water is severed, a temporary repair should be made to maintain flow and prevent flooding of the trench (TGS Pipeline Construction Specification 93-TP.7.9). If the tile drains are not repaired immediately, both severed ends should be covered to prevent the entry of soil or rodents. After the tile has been repaired, and prior to backfilling, the landowner should be asked to inspect and approve each tile repair. To ensure proper repairs are made to each severed tile, TGS Pipeline Construction Specification 93-TP.18 and Figure 93-TP.18.2-A should be followed. If a significant number of tiles are severed, a tile drainage consultant should be retained to assist TGS in developing a drainage tile restoration plan.

5.2 Biological Environment

5.2.1 Municipal Drain Crossings

Municipal drains crossed by the preferred route were identified using the published OMAF Artificial Drainage Systems mapping. This information was confirmed through a discussion with the Township of Moore Drainage Superintendent Mr. G. Hackett. Mr. Hackett confirmed that both drains crossed by the preferred route were "open" municipal drains. An "open" drain is defined as a ditch and/or improved stream course where the channel has been deepened or widened and the slope stabilized.

Along the preferred route, there are 2 open municipal drains crossed in Moore Township which include:

- ♦ Arnold Drain (DC1)
 - South half Lot 20, Conc. VII, Moore Township
- ♦ Ford Drain (DC2)
 - South half Lot 20, Concession V, Moore Township

Both the Arnold Drain and the Ford Drain are identified on the Photomosaics included as Appendix E.

a) Potential Impacts

The low fisheries potential in the municipal drains eliminates many of the concerns associated with natural water crossings. During construction, the disturbance to the drains will be minimal. When a municipal drain is encountered, there is a potential for siltation to occur resulting in a temporary impact on the limited aquatic environment.

A potential concern during and after pipeline construction is the effect of siltation. During construction the sediment load may rise which could result in the downstream impedance of flow. However, the increase in sediments is typically no greater than those resulting from a heavy rainfall. Since both the Arnold Drain and the Ford Drain drains agricultural areas, relatively high levels of silt and nutrient loading already occur during rainfall events and periods of heavy runoff.

Access roads will be required across all municipal drains for the duration of the construction period, these may impede the flows in the drain.

b) Mitigation

Both of the drains encountered by the preferred route have low probability to provide fisheries habitat. TGS Pipeline Construction Specification 93-TP.13 is recommended for both the Ford and Long Drains.

Access roads will be required across the Ford and Long Drains for the duration of construction. Flumes or culverts should be of sufficient length and capacity to provide unimpeded flow across the easement and the access road during maximum anticipated flows (refer to TGS Construction Specification 93-TP.13.2.12).

Municipal drains should be stabilized and restored to their original grade and profile immediately after backfilling. Revegetation should be initiated as soon as possible following construction. In addition, TGS should contact the Township of Moore to obtain a "Road and Drain Crossing Permit" for each drain crossed. These permits establish standards to guide municipal drain construction and rehabilitation.

Hydrostatic Testing

The municipal water supply for Moore Township is recommended for the source of hydrostatic test water. Prior to the withdrawal of any water from the municipal water system the Township of Moore and the Ministry of Environment must be contacted to determine a permissible rate of withdrawal. The Township of Moore and the Ministry of Environment should also be contacted to determine the most suitable dewatering method.

a) Potential Impacts

Soil erosion and crop flooding could occur after hydrostatic testing and dewatering of the pipeline if water is directed onto agricultural lands. Any water pump failure, in or near a municipal drain, could result in leaks directly to the drain causing unnecessary siltation downstream.

b) Mitigation

Potential soil erosion during hydrostatic testing can be eliminated by using an energy dissipater prior to dewatering into the municipal drain system. If the Township of Moore prohibits the discharge of hydrostatic test water into the municipal drain system the water may be discharged to tanker trucks and removed from the site to a suitable location for disposal.

During dewatering, pumps should be underlain by plastic and surrounded by a berm to contain fuel in the unlikely event of a spill or leak. In the event of soil or water contamination, the spill should be reported immediately to the Ministry of Environment Spill Action Centre (1-800-268-6060).

5.2.2 Forestry

Field data for the woodlots and hedgerows were obtained during a field survey in November, 1992. Both woodlots (W1 and W3) and the single hedgerow (H1) potentially impacted by the preferred pipeline were individually assessed. Information recorded on each area include species composition, drainage, environmental sensitivity to construction and existing level of disturbance. A description for both woodlots and the single hedgerow are provided below.

a) Potential Impacts

Along the preferred route one hedgerow (H1) and two woodlots (W1 and W3) will be potentially impacted by construction. Vegetation removal along the preferred route is anticipated to be minimal during construction. Significant clearing is expected to occur only in W1. Impacts on H1 and W3 will be either non-existent or extremely minimal due to their location, species composition or previous exposure to disturbance. W1 is a mature woodlot comprised of bur oak, silver maple, white ash, white elm, shagbark hickory, american beech, ironwood, white oak and red oak. It is located in the north half of the west side of Lot 19, Concession VII. H1 is situated parallel to the preferred route along the north half of the east side of Lot 19, Concession VII, Moore Township and includes mature large diameter specimen species such as bur oak, silver maple, shagbark hickory and red oak. W3 is located in the north half of Lot 20, Concession V. This woodlot is primarily comprised of scrub hawthorn.

b) Mitigation

Prior to construction, and following the surveying of the easement boundaries, a detailed inventory trees impacted in H1, W1 and W3 should be undertaken to determine if there are opportunities to slightly modify the route or restrict workspace to save specimen trees. During construction tree clearing along the preferred route should be minimized to the extent possible. Clearing of the wooded areas should be conducted in accordance with TGS Pipeline Construction Specification 93-TP.2.

Clearing should not be undertaken during the peak bird nesting season of April 15 to July 15 until a nesting survey has been conducted along the preferred route and approval to proceed with clearing activities has been given by an ornithologist.

Woodlots that will be cleared (W1 and W3), should be seeded in accordance with TGS Pipeline Construction Specification 93-TP.17. It is anticipated that a quick recovery of herbaceous understorey will result due to natural ingrowth from adjacent areas. In addition, TGS should discuss replacing trees and shrubs in the working easement with affected landowners following construction.

5.3 Cultural Environment

5.3.1 Rural Community

a) Potential Impacts

The effects of pipeline construction includes noise, dust, and increase of vehicular traffic along local roads. It is anticipated that construction of the pipeline will occur over a period of approximately two to three months. Construction commencement in July will avoid the planting season, and reduce traffic conflict between construction and agricultural equipment.

b) Mitigation

Soil tracked onto roadways by heavy equipment should be cleared immediately after equipment passes. When pipeline construction activities limit access to a farm field, the landowner should be notified ahead of time and the amount of time that access is obstructed should be kept to a minimum.

Complaints from nearby residents concerning noise associated with the operation of heavy equipment can be addressed by confining heavy pipeline equipment operation between the hours of 7:00 a.m. to 8:00 p.m. (MOE, 1978). This time constraint may be less restrictive in areas isolated from residences. When working in the vicinity of residences along the route at Moore Road 6, it is recommended that the majority of the construction be scheduled between 8:00 a.m. to 6:00 p.m. In addition, construction equipment should have mufflers that ensure compliance with guidelines for sound and emission levels (MOE, 1978).

If excessively dry conditions persist during construction, dust control measures may be required. Small volumes of water applied with a low energy spray will suppress dust both on municipal roadways and on the easement. Controlled easement access and immediate site restoration followed by revegetation will minimize the effects of wind and water erosion on soils exposed during construction.

5.3.2 Archaeological Resources

a) Potential Impacts

The Stage One archaeological assessment background study resulted in the identification of no known sites. The fact that no sites were known to be located in close proximity to the preferred route resulted in a potential for unrecorded sites to occur, especially near historic transportation routes.

As a result of the Stage One findings, Archaeological Research Associates Ltd. undertook a Stage Two archaeological assessment to determine the presence of any archaeological resources which may exist along the preferred route. The study was undertaken in accordance with Ministry of Culture and Communications guidelines for archaeological assessments. The Stage Two assessment did not result in the identification of any archaeological sites along the preferred route.

b) Mitigation

No further archaeological studies are required along the preferred route prior to construction. However, if any, unforeseen, deeply buried cultural remains are encountered during construction, all activity should be suspended and the Heritage Branch of the Ministry of Culture and Communications should be contacted to determine a course of action.

6. MONITORING RECOMMENDATIONS

The primary objective of monitoring is to measure the effects of activities of pipeline construction on selected environmental features. Ultimately, the knowledge gained from construction and monitoring is used to avoid or minimize similar problems during subsequent construction projects.

It is recommended that Environmental Inspection of pipeline construction be conducted. The Environmental Inspector should be responsible for ensuring that the mitigation and monitoring requirements within this report are executed effectively. The Environmental Inspector should also ensure that the construction practices used minimize impacts to the environment. In addition, Post Construction Monitoring reports may be required one and two years after construction to document recovery of the easement and the success of clean-up operations.

6.1 Soils and Agriculture

a) Soils

With respect to soils, the Environmental Inspectors should monitor topsoil stripping to ensure that the correct amount of topsoil is removed and stored and also to ensure that it is stockpiled in such a way to avoid mixing with subsoil material. The Environmental Inspector should confirm topsoil depths on site prior to construction.

The Environmental Inspector should recommend to the Chief Inspector and TGS management on whether to discontinue construction during wet soil conditions. Wet soil work shutdown must be enforced during and after heavy rainfall events to ensure that soil compaction, rutting and mixing with subsoil does not occur. These actions are consistent with TGS's wet soil shutdown policy.

Relative soil compaction measurements on and off the easement should be undertaken on cultivated lands after trench backfilling to identify any areas that might require chisel ploughing and/or subsoiling during final clean-up operations.

Potential soil problem areas, on and off the easement, including trench subsidence, soil erosion and stoniness should be noted by the Environmental Inspector at the end of the construction period and after one winter. A list of outstanding areas that may require additional clean-up and/or monitoring should also be compiled and noted.

Soil characteristics, including depth to carbonates and percent of organic matter should be randomly analyzed on and off the easement, after final cleanup. In this way, the relative degree of topsoil/subsoil mixing can be identified, assessed and corrective measures developed.

b) Drainage

Since tile drains will be severed during construction, their efficient operation should be monitored immediately after final clean-up and after the spring thaw the following year. Landowners and administrators should be consulted and given the opportunity to inspect and approve tile repairs before trench backfilling. A linewalk along the trench line should be undertaken after the spring thaw to determine if trench subsidence has occurred. A key element of the linewalk should be a visual inspection of fields connected to repaired tile, to determine if standing water on the fields is due to recent rainfall events or faulty tile repair.

6.2 Aquatic Habitat

Each drain crossing site should be inspected prior to construction to identify erosion sources. A linewalk after construction should be undertaken to visually inspect each drain crossing. At that time, it should be determined whether bank restoration and erosion mitigation measures have been successful.

PART C - STORAGE POOL DEVELOPMENT

This part of the report describes the existing and proposed facilities within the Ladysmith Storage Pool area, potential environmental impacts, and recommends mitigation measures. The environmental features within the storage pool area have been described in Part A, Section 3 and outlined on Map 2, Appendix A. In addition, Appendix E, photomosaic 4 illustrates the existing and proposed locations of access roads, well sites and the pipeline gathering systems.

7. EXISTING AND PROPOSED FACILITIES

7.1 Existing Facilities

A laneway, an oil battery consisting of two oil treaters and storage tanks, three oil wells (McC.M. 1-20-IV, 2-20-IV and 3-20-IV), one suspended oil well (McC.M. 4-20-IV) and one suspended gas well (I.M. 8-20-V) exist within the storage pool area.

The all-weather access road leading to the oil battery will require improvements to handle the traffic flow expected during pool development and storage operations. Individual permanent access roads will be required to all proposed storage well and oil well locations. Access Road Specifications are included in Appendix F.

The three oil wells within the storage pool are shut-in pending the execution of a landowner unitization agreement and equipment revisions to conserve the gas. The suspended oil well, McM.M. 4-20-IV, is proposed to be converted to a storage observation well. The suspended gas well, I.M. 8-20-V, is proposed to be converted to a storage reef observation well. The oil battery is located at the north end of the laneway turn-around. The location of all these wells and facilities is depicted on the photomosaic.

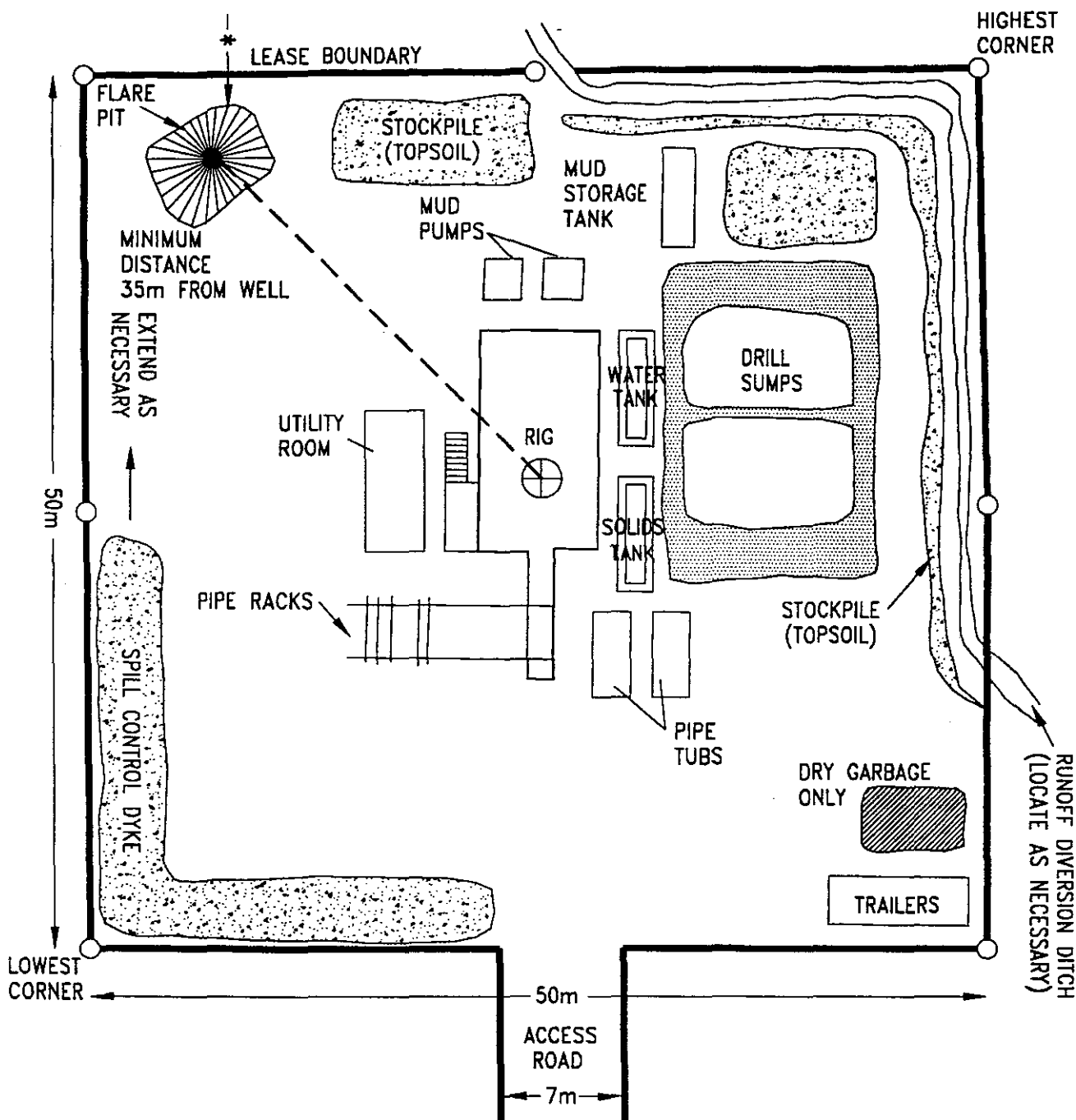
7.2 Proposed Facilities

In order to develop the Ladysmith Pool for gas storage purposes, a number of new facilities are required. These include:

- ♦ five injection/withdrawal wells;
- ♦ improvement of the existing laneway (north half, Lot 20, Concession IV);
- ♦ construction of new access roads to two oil wells, two proposed wells and one observation well in Lot 20, Concession IV;
- ♦ construction of a new access road to three proposed wells in the south half of Lot 20, Concession V;
- ♦ construction of an NPS 14 and NPS 8 pipeline gathering system from the five new wells; and
- ♦ a new valve and dehydrator site in Lot 20, Concession V.

The well drilling operation will require a temporary access road and drill site area approximately 50m x 50m. The site is prepared by overlaying the area with geotextile material and crushed stone. This provides an all-weather working surface for a drilling rig, its related equipment and service vehicles moving on and off the lease. A drilling sump is excavated and/or surface tankage is used to store the drilling fluids and cuttings. The general layout of the drill site is illustrated in Figure 2. After drilling, an access road to the well head and a 7m x 7m crushed stone pad remains around the wellhead to provide access for future operations.

The location of the proposed well sites and permanent access roads are indicated on photomosaic 4, Appendix E. There are no environmental features identified within the approximate boundary of the storage pool that suggests that the wellhead locations will have a significant environmental impact. The proposed location of the wellheads and permanent access roads have been situated so as to minimize any inconvenience of farming operations.



* ENSURE ADEQUATE CLEARANCE BETWEEN FLARE PITS AND TREES IN FORESTED AREAS

TECUMSEH GAS STORAGE



TYPICAL ROTARY DRILL SITE LAYOUT

| | | |
|-------------|-------------------|-----------------|
| Jan., 1993 | File: P066PAD.dwg | FIGURE 2 |
| Proj. GP066 | Scale N.T.S. | |
| Drawn by: | Checked: | |



8. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES FOR THE LADYSMITH STORAGE POOL

8.1 Potential Environmental Impacts

The presence of the existing oil well facilities minimizes the impact of the new injection well facilities on farm operations. The farm operators have already modified their cultivation practices to accommodate the existing oil well facilities. The construction process for the proposed gathering system is similar to the construction process for the field transmission pipeline (see Sections 5 and 6, Part B).

The potential environmental impacts of the development of the Ladysmith Storage Pool including wells, access roads and gathering pipelines are focused on:

- ♦ soils;
- ♦ artificial drainage systems;
- ♦ noise and lighting;
- ♦ general disturbance to the surrounding community; and
- ♦ archaeological resources.

Positive impacts of the storage pool development include: revenues to landowners in the designated storage area, revenue and employment to the local economy, and reduced gas costs to utility customers. In addition, security of supply is enhanced for all customers. The following paragraphs describe the potential impacts in more detail.

8.1.1 Soil

The depth of topsoil in the storage pool area was confirmed in November of 1992 during the detailed field assessment of the preferred route and storage pool area. Topsoil depth was confirmed to be uniform at an approximate depth of 25 cm across the entire storage pool area. No areas of organic soil occur within the storage pool area.

Potential impacts of gathering pipeline construction, well drilling, site preparation and access road construction on soils include the mixing of topsoil and subsoil, compaction and surface erosion. During saturated soil conditions the poorly and imperfectly drained clay loam soils are susceptible to compaction and rutting and have a high potential for damage. At the time of report preparation, TGS had not selected the proposed well drilling method. The environmental impact of the rotary versus cable tool well drilling methods on soil are somewhat similar. The cable tool method requires less equipment, which is generally lighter in weight, than the rotary method. Consequently, potential soil compaction is anticipated to be more prevalent using rotary rig equipment.

Wells TL-4 and TL-5 are proposed to be drilled during the mid-winter period of 1995. Topsoil stripping for permanent access road construction conducted during wet or frozen conditions, can result in severe mixing with subsoil. If soils are wet or frozen during construction of the access road, soil compaction and mixing is a more serious concern. Soil compaction and mixing is also a concern during preparation of the drill pad area if wet or frozen soil conditions exist.

8.1.2 Artificial Drainage

Existing artificial drainage mapping and discussions with landowners revealed that 100% of the agricultural lands located within the boundary of the proposed storage pool area are artificially drained. Temporary or permanent disruption of water flow and the movement of vehicles on wet soils are two construction activities which could result in crop loss due to flooding and soil erosion. Movement of vehicles in the construction area during saturated soil conditions causes rutting which may result in damage to tile drainage systems (crushing). Faulty tile repair and construction during wet soil conditions could also result in significant crop loss due to improper drainage of artificially drained fields.

Drilling of wells TL-4 and TL-5 during mild winter conditions may affect drainage tile integrity. Surface drainage channels may also be impeded by the presence of the drill pad. This could result in flooding of adjacent fields due to natural water removal. Disturbance or damage to drainage tile is anticipated to be at similar levels with the use of either a cable tool or rotary drilling method. There is a higher probability of disturbance to tile drainage if earthen drill sumps are excavated.

8.1.3 Noise and Lighting

Drilling operations can produce noise levels that exceed those typically found in rural areas. Noise levels will be elevated around the immediate drill site areas over a 24 hour period while drilling to the top of the reef formation. Once the top of the reef is encountered, drilling occurs only during daylight hours for safety reasons. Noise levels are more pronounced with a rotary rig operation.

Lights associated with drilling activity will be visible to nearby surrounding residences. This may be disturbing to them.

8.1.4 General Community Disturbance

There will be an increase in traffic from vehicles related to facilities development. These vehicles include drilling rigs, construction equipment, rubber tired vehicles, cement trucks, water trucks and pipeline and casing delivery vehicles. Since access to the well sites will be from Highway 80, traffic congestion along the highway may occasionally occur.

8.1.5 Archaeological Resources

The Stage One archaeological assessment background study resulted in the identification of no known sites. The fact that no sites were known to occur within the approximate boundary of the storage pool resulted in a potential for unrecorded sites to occur, especially near historic transportation routes.

Archaeological Research Associates Ltd. undertook a Stage Two archaeological assessment to determine the presence of any archaeological resources which may occur within the approximate boundary of the storage pool. The study was undertaken in accordance with Ministry of Culture and Communications guidelines for archaeological assessments. The Stage Two assessment resulted in the following findings, which are also described in Appendix D and identified on photomosaic 4, Appendix E:

Archaeological Site A

This site consists of a dense surface scatter of domestic and structural debris (20 x 20 meters) from a farmhouse dating to the last decade of the 19th century, and terminating to a period just after the Second World War. The site is currently being ploughed on a semi-annual basis for cash crops. A small collection (46 artifacts) of surface remains were taken for analysis. Of note at this site were hundreds of red brick fragments, most likely the exterior architectural remains of this house.

Archaeological Site B

This site is also a dense surface scatter (20 x 20 meters), but unlike Site A, this site dates to a much later period, circa 1920-1970. The surface artifacts included coal, wire, lumber, plastic, concrete, and assorted 20th century domestic debris. Because of its recent age, this site is not considered significant.

Archaeological Site C

This site was discovered in a field directly north of Site A, but on the other side of Highway 80. It consists of a scatter of domestic debris (20 x 20 meters) found in the surface soil of a forage crop. Observed remains included white ironstone, stoneware crockery, ball clay pipe stems (Bannerman/Montreal), and glazed red earthenware. Using the observed remains, the site is dated to c. 1870-1890, based primarily on the paucity of typical early 20th century artifacts.

8.2 Mitigation Recommendations

ESP has reviewed TGS's Guidelines for Well Drilling and Site Restoration, and TGS's Permanent Access Road Specifications (Appendix F) and found them environmentally acceptable. However, in addition to these guidelines, the following measures are recommended.

8.2.1 Soils

Topsoil stripped for permanent access road upgrading and construction should be stored and respread over the areas disturbed by pipeline construction and well drilling unless otherwise requested by the landowner. Under no circumstances should the topsoil be used as backfill. Access roads to wells TL-4 and TL-5 should be prepared during dry conditions in late summer or early fall of 1994. The actual drill pads for wells TL-4 and TL-5 should be prepared only during dry or frozen conditions. Topsoil stored over the winter/spring period should be mechanically stabilized to avoid erosion by wind or water or sown with a cover crop specified by the landowner.

8.2.2 Artificial Drainage

For tile drains cut or otherwise disturbed in the drill pad areas proposed for winter drilling, temporary bypasses around the disturbed areas should be installed during late summer or early fall. A tile drainage consultant should be retained to recommend the best method for maintenance of the tile flows over the winter and early spring period. Surface drainage channels crossing the drill pad area should be temporarily diverted around the pad and restored to their original location and contour after the drill pad is removed.

Periodic openings in the topsoil storage piles should be left to ensure that surface drainage is not impeded.

8.2.3 Noise and Lighting

Noise levels will be reduced at nearby residences as a result of attenuation over distances of more than 750 m (nearest residence is 750 m away). However, noise levels can often be further mitigated through the use of mufflers, sound screens, auxiliary brakes when stopping the draw works, by choice of drilling rigs and by orienting the rig to reduce sound levels in the direction of residences. All of these measures should be considered to reduce noise levels to the largest extent possible.

To reduce the visibility of lights used during night operations, they should be oriented away from nearby residences and focused downward on the drill site. Lighting specifications for nighttime highway construction should be reviewed for possible application to the drill sites.

8.2.4 General Community Disturbance

Traffic related to the storage pool development will peak over a relatively short time period of eight to twelve weeks. The Ministry of Transportation (MTO) must be contacted for the new highway access required. Safety precautions along the highway should include construction warning signs, flagmen, and any other requirements specified by MTO. For the most part, landowners within the designated storage area would be most affected by disturbances from the storage pool development.

8.2.5 Archaeological Resources

The Stage Two archaeological assessment within the approximate boundary of the storage pool resulted in the identification of three sites. Two of these sites (A and C) are considered significant, and have been given designation numbers, and have been registered with the Ministry of Culture and Communications. Site B is not considered significant because of its recent age.

As Site B is the only site located in close proximity to the proposed gathering system, no further archaeological studies are required prior to construction. However, if any unforeseen, deeply buried cultural remains are encountered during construction, all activity should be suspended and the Heritage Branch of the Ministry of Culture and Communications should be contacted to determine a course of action.

8.2.6 General Mitigation Measures

Mitigation measures specified for the Ladysmith Storage Pool Transmission Pipeline (Part B) should be followed for construction of the pipeline gathering system. TGS Pipeline Construction Specifications are included in Appendix G. In all cases of spills on or off the drill site, the MOE Spills Reporting Centre must be contacted (1-800-268-6060).

8.3 Monitoring

8.3.1 Compliance Monitoring

An Environmental Inspector should be consulted during soil handling and throughout the drilling process, pipeline and access road construction phase. If a tile drainage consultant is retained, environmental inspection of tiling activities is not required. The Environmental Inspector should also be responsible for ensuring compliance with any OEB Environmental Conditions of Approval. Decisions regarding wet soil work shutdown should be made by the Chief Inspector in consultation with the Environmental Inspector consistent with TGS's wet soil shutdown policy.

8.3.2 Effects Monitoring

The most significant environmental effects of storage pool development are related to soil and artificial drainage system handling. The most significant effects on soils include topsoil/subsoil mixing and compaction. Consequently, soils should be assessed for relative compaction levels, percent organic matter, pH, depth to carbonates and fertility prior to topsoil replacement. If topsoil/subsoil mixing has occurred, the excess topsoil for access road construction should be spread over the disturbed areas. Compacted subsoils should be chisel ploughed or subsoiled, depending on the depth of compaction. Artificial drainage systems should be examined before and after their disturbance/repair to ensure their efficient operation over the adjacent areas being drained. Post construction soil and crop monitoring should be considered in those areas where significant crop loss occurs.

A post-construction monitoring report should be prepared to document construction activities and their short- and long-term environmental effects.

PART D - BIBLIOGRAPHY AND APPENDICES

9. BIBLIOGRAPHY

Argus, G.W., K.M. Pryer, D.J. White, C.J. Keddy eds. 1982-1987. Atlas of the Rare Vascular Plants of Ontario. 4 Vols., Natl. Mus. Nat. Sci., Ottawa.

Booth-Horst, Rae, Laceby, L.R. and D. Parker. 1982. Oil and Gas Pools and Pipelines of Southwestern Ontario. Southern Ontario; Ontario Geological Survey, Map P.2499, Petroleum Resources Map. Scale 1:250,000.

Cadman, M.D. 1989. Ontario Rare Breeding Bird Program Participants Manual. Federation of Ontario Naturalists, Don Mills, Ontario.

Canada Land Inventory (C.L.I.). 1963. Soil Capability for Agriculture, manuscript mapping map (40J/16). scale 1:50,000.

Chapman, L.F. and Putnam, D.F. 1984. The Physiography of southern Ontario; Ontario Geological Survey, Special Volume 2, 270p. Accompanied by Map P.2715 (coloured), scale 1:600,000.

Fitzgerald, W.D., Janicki, E. and Storrison, D.J. 1979. Sarnia-Bright's Grove Area, southern Ontario; Ontario Geological Survey Preliminary Map P. 2222, Quaternary Geological Series. scale 1:50,000. Geology 1977.

Hosie, R.C. 1975. Native Trees of Canada. Seventh edition. Canadian Forestry Service, Department of the Environment. 380p.

Matthews, B.C., Richards, N.R. and Wickland, R.E. 1957. Soil Survey Report No. 22. Ontario Soil Survey, Lambton County.

Ontario Energy Board (OEB). 1989. Environmental Guidelines for Location, Constructing and Operating Hydrocarbon Pipelines in Ontario. 3rd. ed. 9p.

Ontario Ministry of Agriculture and Food (OMAF). 1981. Artificial Drainage System: map for Moore Township, revised August 1991; scale 1:25,000.

Ontario Ministry of Agriculture and Food (OMAF). 1983. Agricultural Land Use Systems: map for Moore Township. scale 1:50,000.

Ontario Ministry of Agriculture and Food (OMAF). 1986. Drainage Guide for Ontario, Publication 29.

Ontario Ministry of the Environment (MOE). 1979. Water Well Records for Ontario: Kent and Lambton Counties. 1946-1974. Water Resources Bulletin 2-24. Ground Water Series. Toronto.

Ontario Ministry of Natural Resources (MNR). 1983. Chatham District Land Use Guidelines. Toronto. 61p.

Ontario Ministry of Natural Resources (MNR). 1988. Oil and Gas Exploration, Drilling and Production Summary. Toronto. 174p.

Rowe, J.S. 1972. Forest Regions of Canada. Canadian Forestry Service, Ottawa. 171p. and map.

Stemmler, K. 1992. Personal Communication. (MNR)

Township of Moore. 1991. Comprehensive Zoning By-Law, By-Law 31.

Township of Moore. 1980. Moore Planning Area. Official Plan.

Township of Moore. 1986. Restricted Area By-Law Number 57, Office Consolidation.

White, J.H. and Hosie, R.C. 1980. The Forest Trees of Ontario: a guide to their identification with illustrations. Seventh edition. Ministry of Natural Resources. Toronto. 114p.

PERSONAL COMMUNICATIONS

Frimminger, Paul. (1992). Key Radio Engineering, CKTY Transmitter Site, Bluewater Broadcasting.

Gilbert, Doug. (1992). Ontario Petroleum Institute.

Hector, Don. (1992). Ministry of Natural Resources, Chatham District.

Knight, Dean. (1992). Archaeological Research Association.

Mackintosh, Jim. (1992). RAM Petroleum.

Parker, Bud. (1992). Archaeological Research Association.

Redford, Jim. (1992). Union Gas.

Schnegelsberg, Ray. (1992). Tecumseh Gas Storage Limited.

APPENDIX A

Map 2 Environmental Features and Alternate Routes

APPENDIX B

Agency Contacts

Mailing List

Mr. R. Hodgins
Ministry of Transportation
1201 Wilson Avenue, 2nd Floor
Downsview, Ontario
M3M 1J8

Ms. Donna Mundie
Ministry of Agriculture and Food
801 Bay Street, 8th Floor
Toronto, Ontario
M7A 2R9

Ms. Bonnie Fox
Ministry of Environment
250 Davisville Avenue, 3rd Floor
Toronto, Ontario
M4S 1H2

Mr. P. Carruthers
Ministry of Culture and Communications
77 Bloor Street West, 2nd Floor
Toronto, Ontario
M7A 2R9

Mr. P. Boisseau
Ministry of Consumer and Commercial
Relations
3300 Bloor Street West, 4th Floor
Etobicoke, Ontario
M8X 2X4

Mr. Peter Burns
Ministry of Housing
777 Bay Street, 2nd Floor
Toronto, Ontario
M5G 2E5

Mr. A. Barrett
Ministry of Energy
56 Wellesley Street West, 11th Floor
Toronto, Ontario
M7A 2B7

Mr. Neil McKay
Environmental Project Manager
Ontario Energy Board
2300 Yonge Street
Toronto, Ontario
M5P 1E4

Mr. H. Wayne Kloske
Chief Administrative Officer
Lambton County
Box 3000
789 Broadway Street
Wyoming, Ontario
N0N 1T0

Mr. John King
General Manager
St. Clair Region Conservation Authority
205 Mill Pond Crescent
Strathroy, Ontario
N7G 3P9

Mr. Doug Huber
Ministry of Environment
Southwest Region
London Regional Office
985 Adelaide Street South
London, Ontario
N6E 1V3

Mr. Ron Whitman
Clerk and Treasurer
Township of Moore
1555 Emily Street
Mooretown, Ontario
N0N 1M0

Mr. D. Pickles
Ministry of Natural Resources
Room 640, Whitney Block
Queen's Park
Toronto, Ontario
M7A 1W3

Mr. Wayne Rowe
District Planner
Chatham District Ministry of Natural
Resources
1023 Richmond Street West
Chatham, Ontario
N7M 5J5

October 13, 1992

Dear :

**RE: Public Information Open House
Route Selection/Environmental Impact Assessment
Proposed NPS 12 Natural Gas Pipeline:
Ladysmith Storage Field to Tecumseh Gas Compressor Station**

Ecological Services for Planning Ltd. (ESP) has been retained by Tecumseh Gas (TGS) to conduct a Route Selection/Environmental Impact Assessment for a proposed natural gas pipeline between the TGS Compressor Station (Lot 19, Concession VII, Moore Township; Lambton County) and the Ladysmith Storage Field (Lot 20, Concession IV and V; Moore Township, Lambton County). The proposed pipeline is 323 mm (12") in diameter and scheduled for construction in the summer of 1993. The location of the Study Area is illustrated on Map 1.

The information we have collected for the Study Area is outlined on Map 1 along with alternate pipeline routes. The four alternate routes, identified as A, B, C, and D are summarized below:

- ♦ Route A runs west, from the Ladysmith Storage Field parallel to Hwy. 80 then turns north and parallels Sideroad 21-22 to the Blind Line north of Moore Road 6. It then turns eastward at the Blind Line and connects to the TGS compressor station.
- ♦ Route B runs northward from the Ladysmith Storage Field parallel to an Ontario Hydro steel tower line to the Blind Line north of Moore Road 6. It then turns eastward to connect to the TGS Compressor Station.
- ♦ Route C runs eastward from the Ladysmith Storage Field parallel to Hwy 80 then turns northward and parallels Sideroad 18-19 to the TGS Compressor Station.
- ♦ Route D parallels Route C along Hwy 80 but continues one lot further east of Sideroad 18-19 where it connects with an existing pipeline easement. It then turns northward and parallels the existing pipeline easement to the TGS Compressor Station.

- 2 -

Based on the environmental features in the Study Area and landowner interviews conducted along each alternate pipeline route, it appears that Route B is the best pipeline route that minimizes environmental impacts. You are invited to attend a Public Information Open House to discuss the project and environmental findings to date. The Meeting is scheduled for:

October 27, 1992
2:00 to 5:00 pm
and
7:00 to 10:00 pm
at the Moore Centre
(northeast corner Lambton Road 31
and Moore Road 6, Moore Township,
Lambton County)

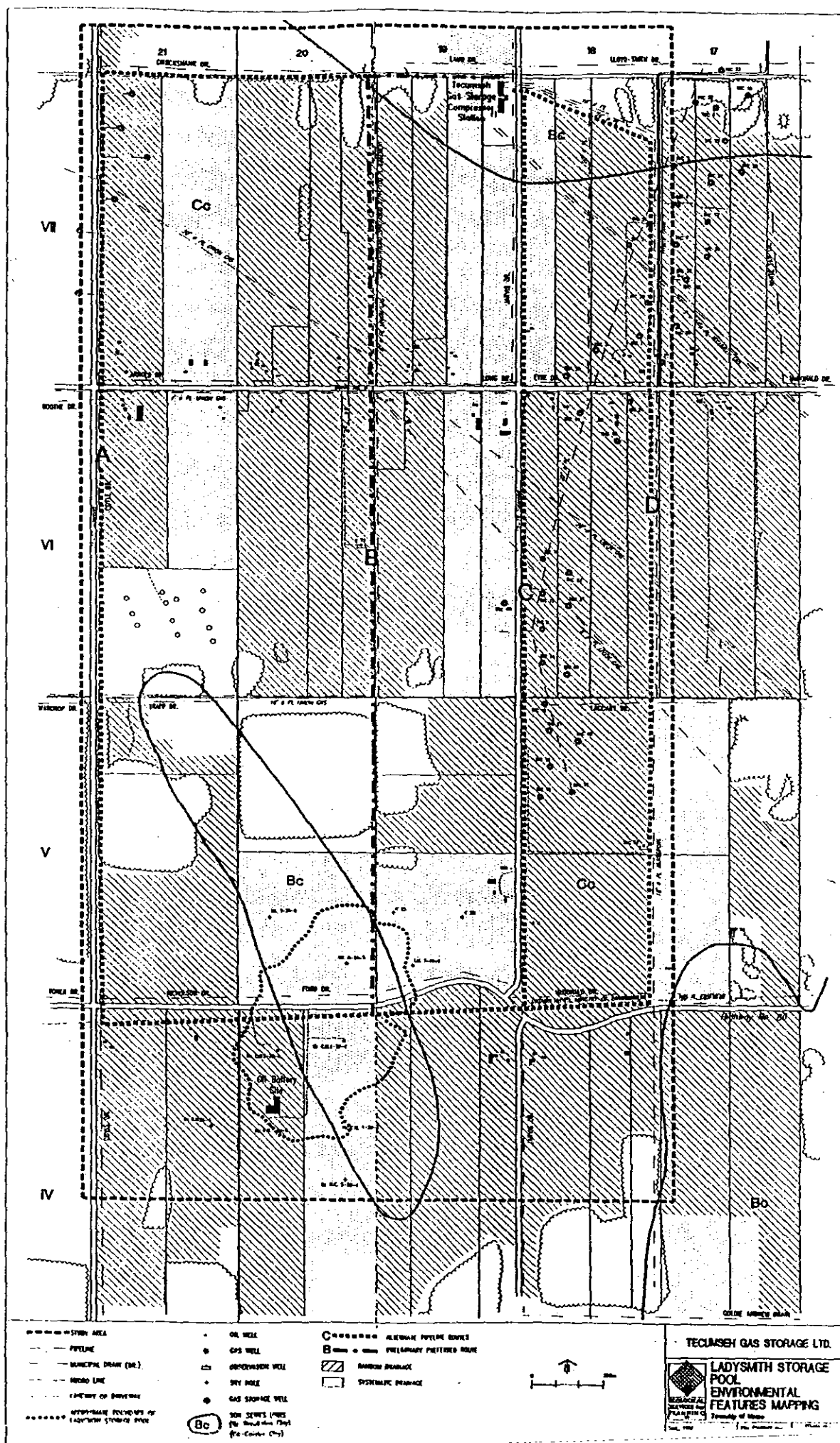
If you have any questions or comments, please contact Mr. D. Wesenger or myself at (519) 836-6050 (call collect).

Yours sincerely,

ECOLOGICAL SERVICES FOR PLANNING LTD.

Peter G. Prier, Director
Environmental Planning Section

PGP:cv
\\reports\\lpublic10.p67

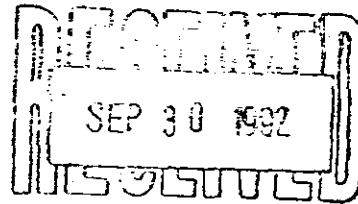




September 24, 1992

c:\don\mozuraitis.let

Mr. Ed Mozuraitis
Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario
N1G 3M5



Dear Mr. Mozuraitis:

**SUBJECT: Proposed Ladysmith Storage Pool/Pipeline - Potential Corridor
 Lot 19, Concession VII, Moore Township to Lots 19-21,
 Concession IV and V, Moore Township, Lambton County**

Further to your fax transmission of September 15, 1992, we have reviewed your geographical terms of reference for the proposed study. At this time no wetlands, Areas of Natural or Scientific Interest, Woodland's Improvement Act Agreements or other specific resource areas are identified for this area. However, this area contains some extensive forested areas. Due to limited forest cover in general in this extreme southwest portion of southern Ontario, we would like to be kept informed of this particular proposal especially with regard to impacts on forested areas.

Some forestry inventory (rough notes) are attached. Please contact Jim Boothby, Forester of this office for any further information.

Yours truly,

Ken Yaraskavitch
Area Supervisor
Ministry of Natural Resources
P.O. Box 1168
Chatham, Ontario
N7M 5L8

Telephone: 519-354-7340
FAX: 519-354-0313

DB4 DGH/II

Attach.

c.c. Jim Boothby

Review from Forests Perspective of Moore Twp, Conc IV - VII, lots 19-21

woodlots as of 1980

| Conc | 21 | Lot 20 | 19 |
|----------|--|--|---|
| IV | H Aw ₄ Ow ₃ Ms ₂ Hi, 45-19-0.5 X | Po ₇ Aw ₂ Ms ₁ 59-27-0.6 H Aw ₅ Hi ₂ Aw ₁ Ms ₁ Or ₁ 65-17-0.6 | Ms ₅ Hi ₃ Ow ₁ Aw ₁ 50-28-0.8 X H Or ₂ Ow ₁ Hi ₃ Aw ₁ Ms ₁ Eu ₁ Or ₁ 51-20-0.5 X |
| V | H Aw ₅ Ms ₂ Ow ₁ Bd, Eu, 35-18-0.4 X | H Aw B-S 1 | H Aw ₅ Ow ₃ Ms ₁ Hi, 30-19-0.6 X |
| VI | H Aw ₆ Ms ₂ Ow ₁ Hi, 45-21-0.8 X | | |
| Conc VII | H Ag ₄ Ms ₂ Mh, Be, Bd, Hi, 50-26-0.9 X | | H Aw ₄ Aw ₂ Or ₂ Ms ₁ Be, 55-19-0.6 X H Aw ₇ Ow ₁ Ms ₁ Or ₁ 30-18-0.6 X |

Aw - White Ash

Ag - Green Ash

Be - Beech

Mh - Hard Maple

Ms - Soft Maple

Bd - Basswood

Or - Red Oak

Ow - White Oak

Eu - White Elm

Or - Bur Oak

Po - Poplar

H - Mixed Hardwoods

→ average height in metres of most dominant tree
45 - 19 - 0.5 - stocking, $\frac{\text{actual basal area}}{\text{optimum basal area}}$ in forest.

Age (average) of most dominant tree in the forest, as of 1980

X - Refers to Site Class which is an indication of productivity

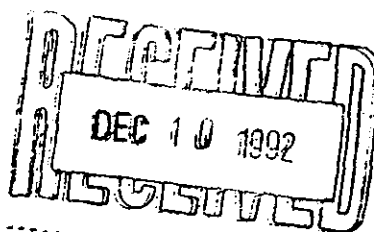
- X is the best
- 4 is the poorest
- other numbers are 1, 2 or 3.

- no affected WITs
- no affected ASAs

Jim.



Ontario



Ministry of Ministère de la
Culture and Culture et des
Communications Communications

55 Centre Street
London, Ontario
N6J 1T4
November 30, 1992

Heritage Policy Branch
(519) 433-8401; Fax: 439-1696

Your File:

Our File:

To: Peter Prier,
Ecological Services for Planning,
361 Southgate Drive,
Guelph, Ontario N1G 3M5

RE: Proposed NPS 12 Natural Gas Pipeline - LadySmith S.F. to Tecumseh Gas C.S.

Review of all southwestern Ontario development projects for possible heritage concerns are conducted from this office, of the Ministry's Regulatory & Operations Unit. Consequently, your letter of October 13th, sent to Peter Carruthers of our Toronto office, was eventually forwarded here for review and comment. My apologies for any delay this re-routing has caused. Please direct all future correspondence directly to this office for prompt response.

I have had an opportunity to review the information provided for the above mentioned project. The proposed alternatives all exhibit a low potential for impacting cultural heritage resources, due to the limited area of impacts and lack of physical-cultural features which would suggest the potential for discovering archaeological sites. Consequently this office has no further concerns for the above mentioned project. Should you wish to discuss this further, please do not hesitate to contact me.

Sincerely,

Neal Ferris
Regulatory & Operations
Southwestern Region
MCC



Ontario

Ministry of
Agriculture
and Food

Ministère de
l'Agriculture et
de l'Alimentation

Legislative Buildings
Queen's Park
Toronto, Ontario

Hôtel du gouvernement
Queen's Park
Toronto (Ontario)

M7A 2B2

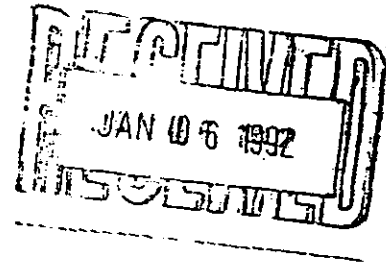
Land Use Planning Branch

(416) 326-3131

Fax (416) 326-3065

December 30, 1992

Mr. Peter G. Prier, Director
Environmental Planning Section
Ecological Services for Planning Limited
361 Southgate Drive
Guelph, Ontario
N1G 3M5



Dear Mr. Prier:

Re: Route Selection/Environmental Impact Assessment
Proposed NPS 12 Natural Gas Pipeline
Ladysmith Storage Field to Tecumseh Gas Compressor
Station

Staff of this Ministry have completed a review of the above-noted proposal. Consideration has been given to the matter in terms of the goals and objectives of this Ministry and the criteria and policies contained in the Food Land Guidelines, which is the provincial policy on planning for agriculture.

Please forward a copy of the comparative evaluation for the various routes. We can then ascertain that the selected route will not compromise the Food Land Guidelines. Please send a copy of the evaluation to Mr. Miller in St. Thomas as well as to this office.

Should you have any questions or wish to discuss this matter further, please contact this office or James R. Miller, at (519) 631-4700.

Yours truly,

Jeannie McNaughton
District Manager

cc: J.R. Miller, St. Thomas

H:\JEM\LADYSMEA.JRM



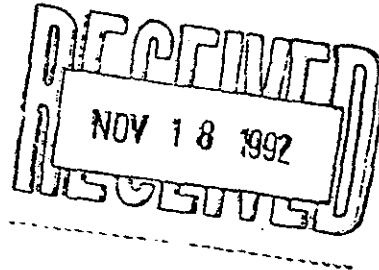


Ministry of
Transportation

Ministère
des
Transports

P. O. Box 5338
659 Exeter Road
London, Ontario
N6A 5H2 Tel.: (519) 649-3029

November 13, 1992



Mr. Peter G. Prier, Director
Environmental Planning Section
Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario
N1G 3M5

Dear Sir:

Re: Route Selection/Environmental Impact Assessment
Proposed NPS 12 Natural Gas Pipeline:
Ladysmith Storage Field to Tecumseh Gas
Compressor Station

The above proposal has been reviewed by Southwestern Region and we support your conclusion that Route B is the best route.

The proposed pipeline Route B crosses Highway 80. Crossings are permitted under the pavement by jacking\ boring only and through an Encroachment Permit. Every crossing will be considered separately after site meetings with our field staff. No open cuts will be considered. Building and Land Use permits are required if the line runs along Highway 80 on private property within 150 feet (45m) of the Highway limit. For information on obtaining permits please contact:

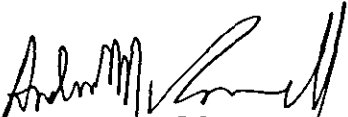
Mr. Peter Bryar
District Engineer
Chatham District Office
P. O. Box 910
60 Keil Drive
Chatham, Ontario
N7M 5L3
Phone (519) 354-1400.

If there are any changes to the selected route or if another route is selected, please contact this office.

- 2 -

Please keep this office informed on the progress of the study.

Yours truly,



A. McConnell, Manager
Engineering & Right-of-Way
Southwestern Region, London



Ontario
Energy
Board

Commission
de l'Énergie
de l'Ontario

P.O. Box 2319
2300 Yonge Street
26th Floor
Toronto, Ontario
M4P 1E4
(416) 481-1967
Fax (416) 440-7656

C.P.2319
2300, rue Yonge
26^e étage
Toronto (Ontario)
M4P 1E4
(416) 481-1967
Télécopieur (416) 440-7656

August 16, 1993

RECEIVED
AUG 25 1993
TECUMSEH GAS
STORAGE

Mr. Ray Schnegelsberg, P.Eng.
Manager, Engineering
Tecumseh Gas Storage
P.O. Box 520
Corunna, Ontario
N0N 1G0

Dear Mr. Schnegelsberg:

Re: Review of Environmental Report - Ladysmith Pool

The Ontario Pipeline Coordination Committee has completed its review of the environmental report for the Ladysmith Pool. No outstanding issues have been identified. I have enclosed a copy of all correspondence received from OPCC members.

Yours truly,

Neil McKay
Chair OPCC

Encl. MA - May 20, 1993
MTO - May 31, 1993
MCCR - June 4, 1993
MNR - June 8, 1993
OMAF - June 16, 1993
MOEE - August 6, 1993

OCT- 5-93 TUE 14:59

Tecumseh Gas Storage

FAX NO. 5198621168

P. 06



Ontario

Ministry of
Municipal
Affairs

Ministère des
Affaires
municipales

RECEIVED

MAY 25 1993

ONTARIO ENERGY BOARD

777 Bay Street
Toronto, Ontario
M5G 2E5

777, rue Bay
Toronto (Ontario)
M5G 2E5

May 20, 1993

Mr. Neil McKay, Chairman
Ontario Pipeline Coordinating Committee
Ontario Energy Board
2300 Yonge St., Suite 2601
Toronto Ontario
M4P 1E4

Subject: Tecumseh Gas Storage

Dear Neil:

We have now had a chance to review the above proposal and staff advise me that the report has addressed this Ministry's concerns and has regard for overall provincial interests.

Yours truly,

A handwritten signature in black ink, appearing to read 'Ron Brown', written over a horizontal line.

Ron Brown
Project Planner
Plans Administration Branch
North and East



Ministry of
Transportation
Ministère des
Transports

Telephone No. 235-3658
Fax No. 235-4004

RECEIVED

JUN 07 1993

ONTARIO ENERGY BOARD

Transportation Corridor
Management Office
2nd Floor, West Building
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

May 31, 1993

Mr. Ray Schnegelsberg, P.Eng.
Manager, Engineering
Tecumseh Gas Storage
P.O. Box 520
Corunna, Ontario
N0N 1G0

Dear Mr. Schnegelsberg:

Re: Ladysmith Pool NPS 12 Pipeline

This ministry has reviewed the Route Selection/Environmental Assessment and Storage Pool Management Plan as prepared by Ecological Services for Planning Ltd., on your behalf and find it acceptable as it relates to the preferred Route (B).

Since this route crosses Highway 80, the appropriate encroachment permit may be obtained from the Ministry's district office located in Chatham.

Yours truly,

A handwritten signature in cursive script, appearing to read 'Art Galloway'.

Art Galloway
Head
Permit Administration
and Compliance Section

cc: Mr. Neil McKay, Ontario Energy Board
P. Ginn
D. Leckie

AAG:ch



Ministry of
Consumer and
Commercial
Relations

Ministère de la
Consommation
et du
Commerce

Technical
Standards
Division

Division
des normes
techniques

3300 Bloor Street West, West Tower
Etobicoke ON M8X 2X4

3300, rue Dufferin, Tour ouest
Etobicoke ON M8X 2X4

Fax: 416/328-8248

Tel: 416/234-6047

Fuels Safety Branch
RECEIVED

June 4, 1993
File: PI-11

JUN 11 1993

ONTARIO ENERGY BOARD

Mr. Ray Schnegelsberg, P.Eng.
Manager, Engineering
Tecumseh Gas Storage
P.O. Box 520
Corunna ON N0N 1G0

Dear Mr. Schnegelsberg:

Re: Ladysmith Pool NPS 12 Pipeline Route Selection Report

This is in response to your May 10, 1993 request for comments on the above report.

Please provide the Fuels Safety Branch with the following information:

1. Confirmation that the design and routing of the pipeline complies with the Fuels Safety Branch Guidelines for Natural Gas Utilities Locating New Pipeline Facilities (attached); and
2. The design specifications of the pipeline, which includes wall thickness, grade, depth of cover, testing, maximum operating pressure, notch toughness requirements, etc.,

Yours truly,

Raphael Sumabat, B.A.Sc.

Attachment

cc: N. McKay, OEB



Ministry of Natural Resources
Ministère des Richesses naturelles

RECEIVED

JUN 11 1993

ONTARIO ENERGY BOARD



353 Talbot Street West
Aylmer, Ontario
N5H 2S8

June 8, 1993

88

Neil
Neil McKay
Ontario Energy Board
Suite 2601, P.O. Box 2319
2300 Yonge Street
Toronto, Ontario
M4P 1E4

Dear Mr. McKay:

SUBJECT: Ladysmith Pool NPS Pipeline Route Selection/Environmental Assessment and Storage Pool Management Plan

Neil, although this report was received at Aylmer on May 11th, I regret that I have not been in the office between then and now in order to initiate a review of it. For this reason, please accept my apologies. We will not be in a position to complete a review by June 14th. However, I should suspect that staff will be able to get a response to you towards the end of June.

Yours truly,

Ian Seddon
Ian Seddon
District Planner
Aylmer District

TEL(519) 773-9241
FAX(519) 773-9014

c.c. Dave Pickles
Ken Yaraskavitch



Ministry of
Agriculture
and Food

Ministère de
l'Agriculture et
de l'Alimentation

Legislative Buildings
Queen's Park
Toronto, Ontario

Hôtel du gouvernement
Queen's Park
Toronto (Ontario)

M7A 2B2

Land Use Planning Branch

(416) 326-3131

Fax (416) 326-3065

RECEIVED

JUN 24 1993

June 16, 1993

ONTARIO ENERGY BOARD

Ray Schnegelsberg, P. Eng.
Tecumseh Gas Storage
P.O. Box 520
Corunna, Ontario
N0N 1G0

Dear Mr. Schnegelsberg:

Re: Route Selection/Environmental Assessment and Storage Pool
Environmental Management Plan
Ladysmith Pool NPS 12 Pipeline
Township of Moore, County of Lambton
Tecumseh Gas Storage

Staff have considered the above proposal in view of the Food Land Guidelines, which is the Provincial Policy on agricultural land use planning and, based on present knowledge, offer the following comments.

It is understood that the purpose of the above report, dated April 1993, is to outline the environmental features in the study area, compare alternative pipeline routes, identify mitigation measures and select the preferred route between the Ladysmith Storage Pool and the TGS Compressor Station. As well, the report outlines the preferred locations for access roads, handling, storage and disposal methods for drill slurry and preferred locations for pipeline gathering systems from the wells.

Based on staff's review, the Ministry is satisfied with the selection of Route B as the preferred alternative. Route B appears to have the least impact upon agriculture of the alternate routes. Staff have reviewed the proposed mitigation measures and are satisfied with the mitigation proposed.

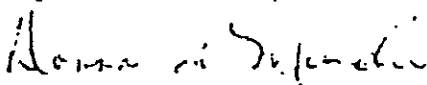
- 2 -

During our review of the report it was noted that the issue of maintaining access to farm fields was not addressed under Section 5.1-Physical Environment. It is suggested that whenever pipeline construction activities will limit access to a farm field, that the landowner be notified a head of time and that the amount of time that access is obstructed be kept to a minimum.

In summary, staff have no objections to the selection of Route B as the preferred route and are satisfied with the agricultural mitigation measures proposed. We would suggest that consideration be given to addressing the issue of maintaining field access during pipeline construction.

If you have any questions, do not hesitate to call myself at (416) 326-3120 or Betty Summerhayes, Land Use Specialist at (416) 527-2995 or 1-800-263-8520.

Yours truly,



Donna Sharp Mundie
District Manager

cc: Betty Summerhayes, Ancaster
~~Neil McKee~~ Ontario Energy Board



Ministry of
Environment
and Energy

Ministère de
l'Environnement
et de l'Énergie

250 Davisville Avenue
Toronto ON M4S 1H2

250, avenue Davisville
Toronto ON M4S 1H2

ENVIRONMENTAL PLANNING BRANCH

Tel. (416) 440-3709

Fax. (416) 440-6973

3rd Floor

RECEIVED

AUG 10 1993

ONTARIO ENERGY BOARD

August 6, 1993

MEMORANDUM

To: Neil McKay
Chairman - Ontario Pipeline Coordinating Committee
Ontario Energy Board

From: Bonnie Fox
MOE Representative - Ontario Pipeline Coordinating Committee
Environmental Planning Branch

RE: Tecumseh Gas Storage: Ladysmith Pool NPS 12 Pipeline Route Selection

Southwest Region has reviewed the above report and they have no concerns since there are no stream crossings involved.


Bonnie Fox



Ontario

Ministry of
Culture, Tourism
and Recreation

Ministère de la
Culture, du Tourisme
et des Loisirs

Cultural Operations & Field Services Branch
(519) 433-8401; Fax: 439-1696

To: Ray Schniegelsberg
Tecumseh Gas Storage
P.O. Box 520
Corunna, Ontario, N0N 1G0

RECEIVED

JUL 8 1993

**TECUMSEH GAS
STORAGE**

55 Centre Street
London, Ontario
N6J 1T4
June 22, 1993

Your File:

Our File:

RE: Ladysmith Pool NPS Pipeline Route EA

I have had an opportunity to review the archaeological assessment report submitted by Bud Parker, of the archaeological consulting firm of Archaeological Research Associates Ltd. I have also reviewed the EA and management plan submitted for this project. Mr. Parker reports finding 4 archaeological sites during his assessment of the study area, two of which are deemed to be significant enough to warrant further investigations. However, the EA report indicates that the preferred route for this project will not impact either of the two sites in question. Given this, our Ministry has no further concerns with the project, and are satisfied that cultural heritage resources have been adequately documented.

I trust that these comments are of assistance. Should you wish to discuss this further, please do not hesitate to contact me.

Sincerely,

Neal Ferris
Regulatory & Operations
Southwestern Region
MCTR

cc. B. Parker, Archaeological Research Associates Ltd.



APPENDIX C

Landowner Participation

LANDOWNER CONTACT LIST

M. Wolff
RR # 1
Courtright, ON
N0N 1M0

Pat Starr
RR # 1
Mooretown, ON
N0N 1M0

Roy Will
RR # 1
Mooretown, ON
N0N 1M0

Jim Eyre
RR # 1
Mooretown, ON
N0N 1M0

C. Lumley
RR # 1
Mooretown, ON
N0N 1M0

Reg Hardy
RR # 1
Mooretown, ON
N0N 1M0

J. Lapier
RR # 1
Mooretown, ON
N0N 1M0

Eugene Robbins
RR # 1
Mooretown, ON
N0N 1M0

Art Eyre
RR # 1
Mooretown, ON
N0N 1M0

Claire Robbins
RR #1
Mooretown, ON
N0N 1M0

C. Baker
RR # 1
Mooretown, ON
N0N 1M0

Mabel James
RR # 1
Mooretown, ON
N0N 1M0

C. Young
RR # 1
Mooretown, ON
N0N 1M0

Gary Robbins
RR # 1
Mooretown, ON
N0N 1M0

Elmer Judas
RR # 1
Mooretown, ON
N0N 1M0

Oliver Smith
RR # 1
Mooretown, ON
N0N 1M0

Doug Henderson
RR # 1
Mooretown, ON
N0N 1M0

E & J Schmidt
RR # 1
Courtright, ON
N0N 1H0

Bryan Arnold
RR # 1
Courtright, ON
N0N 1H0

Murray Marsh
RR # 1
Wyoming, ON
N0N 1T0

Allen Long
RR # 1
Mooretown, ON
N0N 1M0

Don Stewart
RR # 1
Mooretown, ON
N0N 1M0

Brian Stewart
RR # 1
Mooretown, ON
N0N 1M0

Mel Anderson
RR # 1
Mooretown, ON
N0N 1M0

Bluewater Broadcasting
Paul Firminger
Key Radio Ltd.
Mooretown, ON
N0N 1M0



TECUMSEH GAS STORAGE LIMITED

P.O. BOX 520, CORUNNA, ONTARIO N0N 1G0

AREA CODE 519
TELEPHONE 862-1473

1992-09-09

Dear

Re: Ladysmith Pool Landowner Meeting - Sept.14/92

You are invited to attend an information meeting at the office of Tecumseh Gas Storage Ltd. on Sept.14/92 at 8:00PM. The purpose of this informal meeting will be to discuss the proposed unitization of the landowner royalty interests in the Ladysmith Pool and to provide information regarding Tecumseh's plan to develop the Pool for natural gas storage.

If you should have any preliminary questions, or if you should require any additional information, please call me at 862-1473.

Yours truly,

F. James Tricker
General Manager

cc: Bev Wilton
Bill Coldicott
C 40 010
C 04 030

Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario N1G 3M5
(519) 836-6050

Ladysmith Storage Pool Facilities Development
Well Sites Access Roads and Pipelines
Landowner Survey

Date: _____

Name: _____

Address: _____

Township: _____

Lot: _____ Concession: _____

Telephone: _____

Will you allow members of the study team to walk on your property to further evaluate woodlots, streams, soils, archaeological artifacts, etc.

Yes: _____ No: _____ Comments: _____

Are you the Owner _____ or Tenant _____ of this property.

Please provide owner/tenant particulars if applicable.

Name: _____

Address: _____

Phone No.: _____

A. Biophysical Impact Assessment

1. What is the total acreage of your property _____
Do you farm the land Yes _____ No _____
Number of acres farmed _____
Remaining Acres? _____
2. Water wells (locate on photo) Type _____ Depth _____
Operational _____ Use: (domestic/livestock) _____
Approximate distance from proposed pipeline _____
Water quality/quantity problems _____
3. Municipal water supply: Yes _____ No _____
Septic Tanks: Yes _____ No _____
Location _____
4. Buried utility lines: Yes _____ No _____
Type and location: _____
5. Tile drainage (locate on maps) Yes _____ No _____
Type: _____
Do you intend to put in tile drainage in the next year?
Specify: _____

6. Irrigation Yes _____ No _____
Any future plans _____
Source irrigation water _____

7. Streams/ponds on property Yes _____ No _____
Municipal drains Yes _____ No _____
Location _____
Stream/drain flow in summer Fast flowing _____ Slow _____
Intermittent _____ Dried Up _____
8. Fisheries: any fish in stream? Yes _____ No _____
Spawning areas Yes _____ No _____
Fishing Activities Yes _____ No _____
Fish species _____
9. Are there any swamps, marshes or wetlands on your property? Yes _____ No _____
(Locate on map, if applicable) _____

10. Cultural/historical features (including archaeological finds) _____

Will grant permission if required for archaeological survey Yes _____ No _____
11. Woodlots/hedgerows/unique or specimen trees on property? Yes _____ No _____
Specify _____

12. Any personal woodlot management plans Yes _____ No _____ Specify _____

Any specimen trees that you consider sensitive? _____

Is there a government approved management plan for your woodlot?

Yes _____ No _____ Specify _____

13. Rare plants/wildlife Yes _____ No _____ Don't know _____ Specify _____

14. Soil Type: Sand _____ Sandy loam _____ Loam _____

Clay loam _____ Clay _____

Problems: Compaction _____ Stoniness _____ Erosion _____

Wetness _____ Specify _____

15. What is the main activity on your land? (Rank in order of importance)

Farming _____ Nonfarming _____ Cash cropping _____

Dairy farming _____ Horse farm _____

Feeder operation _____ Other _____

16. What is the land use (include all uses) (mark on maps)

Pasture _____ Spring grains _____ Soybeans _____

Corn _____ Winter wheat _____ Woodlots _____

Other _____

What fields are the best producers? (mark on maps)

17. If you already have a wells, access roads and/or pipeline on your property, do you think that these facilities will have the same effect as the existing facilities or will it be different?

Yes _____ No _____ Don't know _____

Specify _____

18. Do you have other Tecumseh Gas facilities on your property? Yes _____ No _____

Were you living at your present residence before the existing facilities were constructed?

Well sites? Yes _____ No _____ Don't know _____

Access roads? Yes _____ No _____ Don't know _____

Pipelines? Yes _____ No _____ Don't know _____

19. Have your cropping patterns or farming practices changed as a result of these facilities? _____

20. Are there any buildings or residences within 100 m of proposed facilities?

21. Have you experienced any limitations on the construction or use of farm buildings specifically because there are facilities on your property? _____

22. Do you have any plans to make improvements to your home or change how you use your property or farming practices in the next year (eg. build a new barn, addition to your house, landscaping etc., land severance).

Yes _____ No _____

If yes, what are your plans? _____

23. Would the proposed facilities affect these plans in any way?

Yes _____ No _____ Don't know _____

24. Do you have any routing/siting preferences on your property, or among the alterate routes? _____

25. Access requirements during construction for farm equipment/livestock _____

26. Location of potential access routes to the facilities _____

27. Do you see any major changes in the uses of your property in the future?

Yes _____ No _____ Specify _____

28. Briefly comment on your experience/relations with Tecumseh Gas Storage (if any) in the past.

a) In what ways has it been positive? _____

b) In what ways has it been negative? _____

c) How could Tecumseh Gas Storage improve your experience with facilities development in the future? _____

29. How may potential impacts resulting from pipeline construction affect you in terms of:

a) Your land? _____

b) Your income? _____

c) Your sense of well being? _____

d) Your lifestyle? _____

30. Do you have any general comments on the impact of the proposed facilities on your or your family? _____

Confidentiality

The results of this questionnaire may be reviewed and become part of the public record through the OEB. If you wish this information to remain confidential, please indicate.

PUBLIC NOTICE

Tecumseh Gas Storage has retained Ecological Services for Planning Ltd. (ESP) of Guelph Ont., to prepare a Route Selection Study and Environmental Assessment (EA) for Tecumseh's proposed 323 mm (12") diameter natural gas transmission pipeline connecting the Tecumseh compressor site (Lot 19 Conc VII Moore Township) to the proposed Ladysmith storage field (Lot 20 Conc IV), a distance of approximately 5km (see inset). You are invited to attend a public information open house to review the details of Tecumseh's proposal and the EA. The public information open house will be held on:

OCTOBER 27, 1992

2:00 to 5:00 p.m. and

7:00 to 10:00 p.m. at Moore Centre

(NE corner Lambton Rd. 31 and Moore Rd. 6)

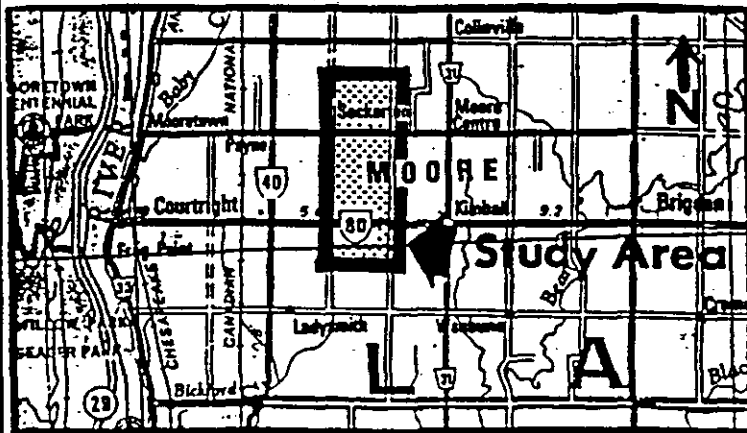
To date a number of pipeline route alternatives have been developed, route evaluation criteria determined and a preferred route identified. Landowner, public and agency comments are encouraged to assist with the final selection of the pipeline route. Representatives from Tecumseh Gas Storage and ESP will be available to answer your questions.

Tecumseh Gas Storage

(a division of the Consumers Gas Company Ltd.)

P.O. Box 520 Corunna, Ontario N0N 1G0

519-862-1473

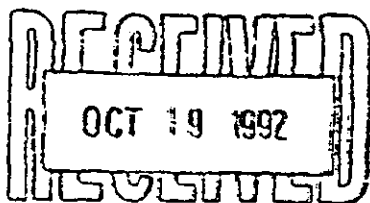




TECUMSEH GAS STORAGE

P.O. BOX 520, CORUNNA, ONTARIO N0N 1G0
a division of The Consumers' Gas Company Ltd.

AREA CODE 519
TELEPHONE 862-1473



1992-10-16

Dear ...

You are cordially invited to attend an informal open house, hosted by Tecumseh Gas Storage, on October 27, 1992, from 2:00 p.m. to 5:00 p.m. or 7:00 p.m. to 10:00 p.m. at the Moore Centre (NE corner of Lambton Rd 31 and Moore Rd 6). The purpose of the open house is to present the results of the Route Selection Study and Environmental Assessment (EA) for Tecumseh's proposed 323 mm (12") diameter natural gas pipeline, from the Tecumseh compressor site to the future Ladysmith storage field.

To date, Mr. Peter Prier of Ecological Services for Planning, has developed a number of pipeline route alternatives, reviewed the environmental features of each route and has solicited questionnaire responses from yourself and other landowners in the study area. All of this information has been used to identify a preferred route as shown on the attached map.

This open house will provide a further opportunity for you to comment on the EA and the preferred route. Your comments could impact on the selection of the final pipeline route. Representatives from Tecumseh and Mr. Peter Prier, will be on hand to personally answer any of your questions and/or discuss your concerns. We hope to see you there.

Sincerely,

F.J. Tricker
General Manager

rs
encl.
cc: P. Prier - ESP
T-52-510
C-50-060

92-10-27

**TECUMSEH GAS STORAGE
LADYSMITH PIPELINE PUBLIC MEETING
ATTENDANCE RECORD**

| FULL NAME | AFFILIATION/MAILING ADDRESS |
|-----------------------------|-----------------------------|
| Jane Marsh | Mayor, Moore Twp. |
| Elmer Jordan | R.R.1 Courtwright |
| Ed & Gene | R.R.1 BRIGGS |
| DAVID MILLER | R.R.1 MOORETOWN |
| JOE WELLINGTON | R.R.1 CORUNNA |
| Allan Long | R.R.#1 Mooretown |
| Pat & Brian Stewart | R.R.#1 MOORETOWN. |
| Murray Marsh Annie Marsh | R.R.#1 Hyson, Ont. |
| Don & Eric Stewart | R.R.#1 Mooretown |
| James Eyre | R.R.1 Mooretown |
| Chris Mull | R.R.#1 Bryden |
| Don Whitham | 2321 Hwy 80, Bryden |
| Steve Jones | R.R.#1 Mooretown |
| | |
| | |

**Proposed Tecumseh Gas Storage -
Ladysmith Storage Pool Pipeline Route Selection
and Environmental Impact Assessment
Public Information Open House Questionnaire**

Please complete this questionnaire and return it to an ESP representative or mail it to Ecological Services for Planning Ltd. by Tuesday, November 3, 1992. Just ask for a self addressed envelope.

1. What is your interest in this study? (please check one)

Landowner _____ Member of Special Interest Group _____

Interested Citizen _____ Government Official _____

Other (please specify) _____

2. How did you find out about tonight's meeting? (please check one)

Letter of invitation _____ Newspaper _____

Other (please specify) _____

3. Please identify any environmental features in the study area which are either incorrectly mapped, omitted or that you feel are important to consider during the study. (Please state your reasons).

4. Which factors do you feel are most important to compare and evaluate alternate routes (i.e., agriculture capability, artificial drainage, landowner preference, etc.)

5. Have you been interviewed for this study?

Yes ____ No ____

If you were not interviewed, please comment on any concerns you may have with the preferred route selection process or the preferred route itself?

6a) Please indicate your satisfaction with the following:

Satisfied

Not Satisfied

Location of Meeting

Time

Day of Week

Displays

b) How useful were the presentations and discussions? (Please circle one number)

Very Useful

Not Useful

1

2

3

4

5

c) Additional comments:

Thank you for your comments

APPENDIX D

Stage 1 and Stage 2 Archaeological Assessments

Stage One
Archaeological Assessment

ARCHAEOLOGICAL ASSESSMENT
STAGE 1: BACKGROUND STUDY
TECUMSEH GAS STORAGE LTD
PROPOSED LADYSMITH PROJECT
MOORE TOWNSHIP
COUNTY OF LAMBTON

Prepared for

Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario N1G 3M5

by

L.R. Bud Parker
ARCHAEOLOGICAL RESEARCH ASSOCIATES LTD.
R.R. 2, Petersburg, Ontario N0B 2H0

under

Ontario Heritage Foundation
Licence No. 92-023

September 1992

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1.0 Personnel

- 1.1 Project Director: Dean H. Knight
- 1.2 Project Manager: L.R. Parker
- 1.3 Background Research: L.R. Parker
- 1.4 Report Preparation: L.R. Parker
- 1.5 Graphics: L.R. Parker

2.0 Introduction

Under a contract awarded in September 1992, the proposed Tecumseh Gas Storage Ltd., Ladysmith study area in Lambton County, Ontario, was archaeologically assessed for known and potential archaeological resources by Archaeological Research Associates Ltd. This work was under contract granted by Ecological Services for Planning Ltd. of Guelph. This "Stage One" archaeological assessment was conducted to determine the presence of any known heritage resources, and the potential for archaeological resources which might be extant on the property and, if so, what steps need to be taken for their management. The study was conducted in accordance with Ministry of Culture and Communications guidelines for Stage One archaeological assessments (TFSR 1992:6-9).

3.0 Location

The study area consists of a small land parcel, in central Moore Township in western Lambton County. The study area is delineated, approximately, by Concession Road VIII in the north; Regional Road 31, in the east; Concession Road II in the south; and Highway 40 west (Figures 1 and 2).

The proposed pipeline is to begin in Lot 19, Concession VI, and ends in Lots 19 and 20, Concession IV.

4.0 Geography and Archaeological Potential

The subject land lie within the Carolinian Biotic Province, which is described as favouring the growth of:

...oak, hickory, maple, beech, walnut, butternut, elm, tulip, ash, basswood, sycamore and cottonwood. Cedar and tamarack are fairly common in swampy tracts. White pines and even spruce are locally numerous ... especially in the north reaches of the biome (Mason 1981:60, in Janusas 1987:3).

The physiographic region of the study area is predominately part of the St. Clair Clay Plains. Soils of the St. Clair Clay Plains are characteristically heavy in texture and poorly drained. In Lambton, they are known as the Lambton Clay Plain, and contain areas of bevelled till plains covered by a thin veneer of lacustrine clays. These conditions favour the Lambton area in contrast to the Essex region, with the former exhibiting better vegetation development and drainage features (Chapman and Putnam 1969:243). There are two soil types in the region: Brookston and Caistor clays, both of which are imperfectly drained (ibid).

The underlying bedrock of the study area is of the Upper Devonian shales of the Kettle Point and Port Lambton formations (Poole et al 1972:284). The bedrock varies in depth below the surface till, but is nevertheless deeply buried, and does not outcrop.

The archaeological potential of the lands were assessed using their soils, hydrology, and landforms as considerations. According to Janusas: "The location of early settlements tended to be dominated by the proximity to a reliable and potable water

resource..." (1988:1). The study area has no obvious sources, using the NTS 1:50,000 topographic map. The soils, being imperfectly drained, and the proximity to water sources imply a moderate potential for prehistoric archaeological sites (see Appendix One).

The potential for historic sites is high in the study area. According to historical sources, the study area was settled by Europeans in the mid-nineteenth century. Among the first settlers were British and North American farmers who settled along the available concession roads (Phelps 1973:70). The nearest large settlement is Courtright, which was settled first by Francis Decatur before 1800, but was not an established town until the establishment of the Canada Southern Railway (modern Highway 80 follows the old railbed) (ibid:17). Most of the 1880 atlas subscribers in the study area arrived in Moore Township between 1848 and 1877 (ibid:70), while a few significant historical buildings were in existence in 1880 (ie. school in Lot 22, Concession VI, Templar Hall in Lot 19, Concession VIII) (ibid). The small hamlet of Seckerton is within the study area, and like other nearby small, rural communities, it was established in the last quarter of the 19th century (ibid:62).

5.0 Background Research

Archival research was conducted using the Ministry of Culture and Communications site data files in order to determine the presence of any known heritage resources which might be located in the study area. It was found that in the study area there are no registered archaeological sites, and no sites are located within three kilometres.

Given that the study area has no known archaeological sites, and exhibits

moderate to high archaeological potential for yet undiscovered archaeological remains, then it is anticipated that any selected preferred pipeline routes may impact unknown sites. Of course, if the preferred routes are aligned within already disturbed lands (ie. road allowances, or other pipeline easements), then the negative impacts of the proposed pipeline on archaeological heritage will be greatly lessened. It is suggested, that based on past studies, and using some models of archaeological site potential (Peters 1986; Pihl 1986), most prehistoric archaeological sites will be found within 150 metres of remnant or extant water sources. However, non-habitation sites (ie. burials, resource gathering sites, and kill sites), may be located anywhere. Historic sites tend to be near the transportation routes of the study area, namely: post-1850 sites are located along the historically surveyed roads.

6.0 Conclusions and Recommendations

The archaeological assessment background study for the study area has resulted in the identification of no known archaeological sites. The potential for unrecorded sites is high, especially near historic transportation routes.

We recommend that further archaeological studies are needed to assist in predicting potential heritage resource impacts along the proposed preferred installation routes of the pipeline in the study area. These studies would entail Stages 2 and 3 (TF SR 1992) of an archaeological assessment along the corridor of the proposed preferred route. In these studies, all lands slated for pipeline impact shall be searched using visual survey and/or shovel test-pitting, in areas deemed to have had minimal, recent disturbances (ie. not previously impacted by land developments such as road construction). From these studies the results should provide a more complete inventory

of the archaeological resources within the preferred routes, and heritage management options will be presented for further work, if required.

7.0 References Cited

Chapman, L.J., and D.F. Putnam

1966 The Physiography of Southern Ontario. University of Toronto Press, Toronto.

Janusas, S.E.

1987 An Analysis of the Historic Vegetation of the Regional Municipality of Waterloo. Regional Municipality of Waterloo.

1988 The Cultural Implications of Drainage in the Municipality of Waterloo. Regional Municipality of Waterloo.

1991 Archaeology Brochure from the Archaeology Division, Regional Municipality of Waterloo, Planning and Development Department.

Mason, R.

1981 Great Lakes Archaeology. Academic Press, New York.

Murphy, C., and N. Ferris

1990 The Late Woodland Western Basin Tradition in Southwestern Ontario. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:189-278.

Peters, J.

1986 Transmission Line Planning and Archaeological Resources: A Model of Archaeological Potential for Southwestern Ontario. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:19-

Phelps, E.

1973 Belden's Illustrated Historical Atlas of the County of Lambton Ontario, 1880. Port Elgin, Ontario. (Reprint of original).

Pihl, R.

1986 Site Potential Modelling in Archaeological Consulting. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:29-40.

- Poole, W.H., B.V. Sanford, H. Williams, and D.G. Kelley
1972 Geology of Southeastern Canada. Geology and Economic Minerals of Canada. Edited by R.J.W. Douglas. Geological Survey of Canada, Economic Geology Report No. 1, Dept. of Energy, Mines and Resources, Ottawa. pp. 227-304.
- Spence, M.W., R. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:125-170.
- TFSR (Task Force on Self Regulation)
1992 Archaeological Assessment Technical Guidelines: April 1992. Arch Notes. 92-3:6-19.

8.0 Acknowledgements

The study of the proposed pipeline study areas was made possible with the support of Dave Wesenger and Ed Mozuraitis of Ecological Services for Planning Ltd., with additional assistance from Bernice Field, Data Coordinator, Archaeology, Ministry of Culture and Communications, Toronto.

SOUTHERN ONTARIO

COUNTIES AND GEOGRAPHICAL TOWNSHIPS

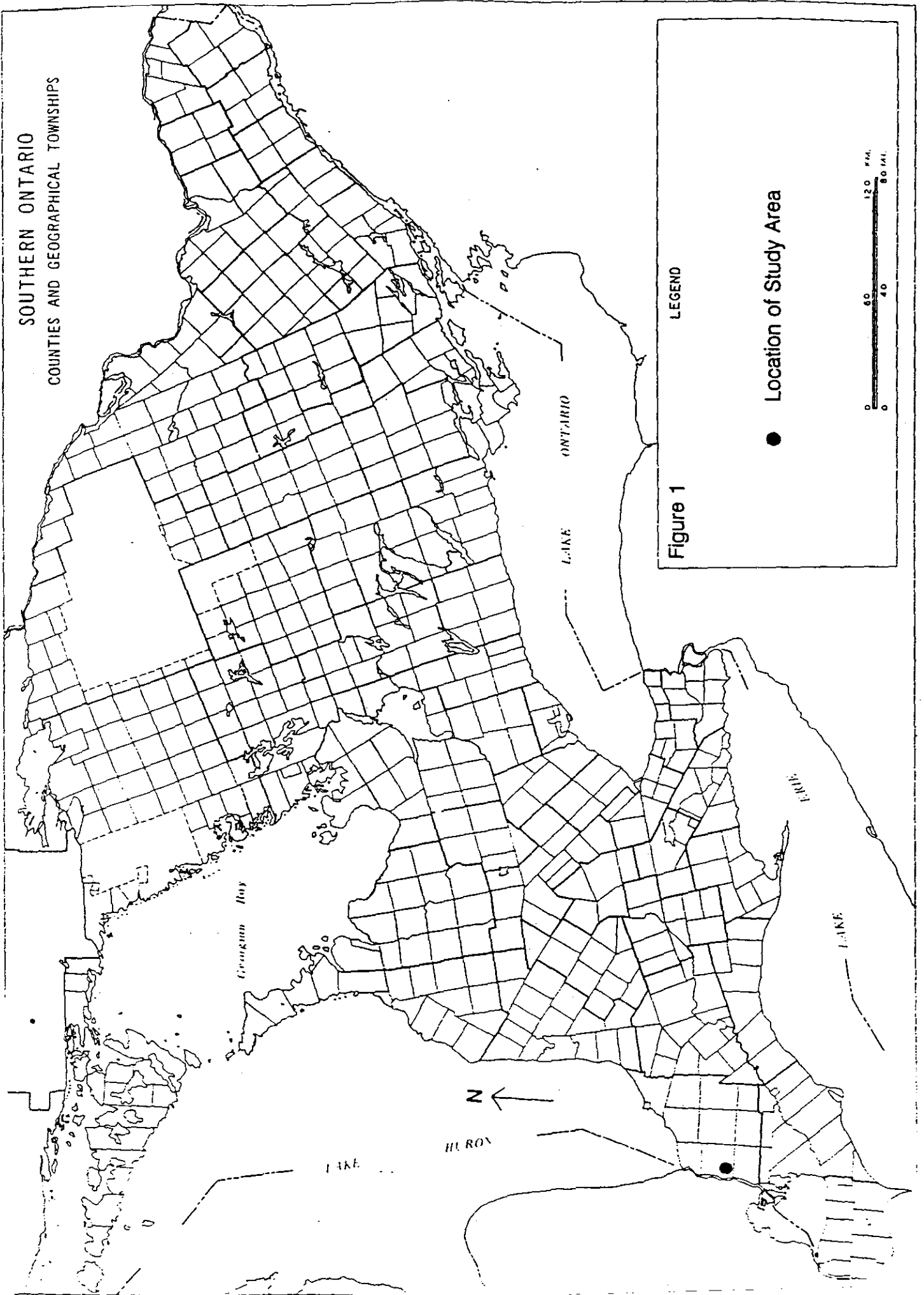
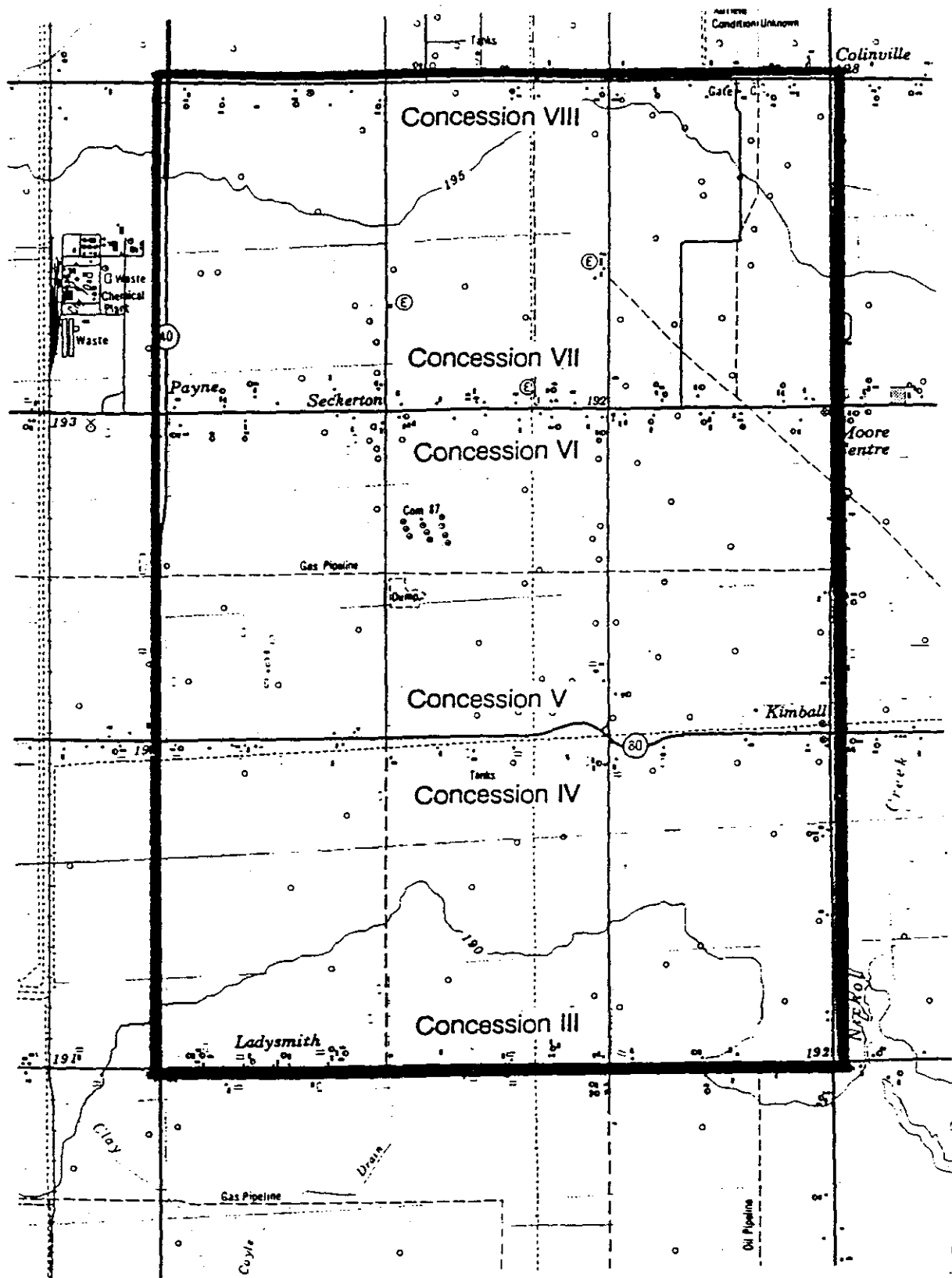


Figure 1

LEGEND

● Location of Study Area

0 40 80 120 M.I.
0 60 120 K.M.



Study Area Boundary

Figure 2

Tecumseh Gas Storage Ltd.
Ladysmith Project

N

Scale 1:50,000

Appendix One

CULTURAL CHRONOLOGY FOR SOUTH WESTERN ONTARIO

| <u>Period</u> | <u>Group</u> | <u>Time Range</u> | <u>Comment</u> |
|---------------|-----------------------------|---------------------|---|
| PALEO-INDIAN | | | |
| | Fluted | 9500 - 8500 B.C. | Big Game hunters; small, nomadic groups |
| | Hi-Lo | 8500 - 8000 B.C. | |
| ARCHAIC | | | |
| Early | Side-notched | 8000 - 7700 B.C. | Nomadic hunters and gatherers |
| | Corner-notched | 7700 - 6900 B.C. | |
| | Bifurcate Points | 6900 - 6000 B.C. | |
| Middle | Stemmed Points | 6000 - 3500 B.C. | Transition to territorial settlements |
| | Notched Points | 3500 - 2500 B.C. | |
| WOODLAND | | | |
| Early | Meadowood | 900 - 400 B.C. | Introduction of pottery |
| | Adena | 400 B.C. - A.D. 1 | |
| Middle | Couture/ Riviere au Vase | 300 B.C. - A.D. 500 | Incipient horticulture Transition to village life and agriculture |
| | Riviere au Vase | A.D. 500 - 900 | |
| Late | Younge | A.D. 900 - 1300 | |
| | Springwells | A.D. 1300 - 1400 | |
| | Wolf | A.D. 1400 - 1650 | |
| HISTORIC | | | |
| Early | Historic Native | A.D. 1700 - 1875 | Tribal displacements |
| Late | Euro-Canadian | A.D. 1800 - present | European settlement |

(From: Janusas 1991; Murphy and Ferris 1990:196; Spence et al 1990:144)

Stage Two
Archaeological Assessment

ARCHAEOLOGICAL ASSESSMENT
TECUMSEH GAS STORAGE LTD
PROPOSED LADYSMITH PROJECT
MOORE TOWNSHIP
COUNTY OF LAMBTON

Prepared for

Ecological Services for Planning Ltd.
361 Southgate Drive
Guelph, Ontario N1G 3M5

by

L.R. Bud Parker
ARCHAEOLOGICAL RESEARCH ASSOCIATES LTD.
R.R. 2, Petersburg, Ontario N0B 2H0

under

Ontario Heritage Foundation
Licence No. 92-023

November 1992

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1.0 Personnel

- 1.1 Project Director: Dean H. Knight
- 1.2 Field Director: L.R. Parker
- 1.3 Crew: Shawn Standfast
- 1.4 Background Research: L.R. Parker
- 1.5 Report Preparation: L.R. Parker
- 1.6 Graphics: L.R. Parker

2.0 Introduction

Under a contract awarded in October 1992, the proposed Tecumseh Gas Storage Ltd., Ladysmith pipeline and storage pool in Lambton County, Ontario, was archaeologically assessed on November 6, 1992, for archaeological resources by Archaeological Research Associates Ltd. This work was under contract granted by Ecological Services for Planning Ltd. of Guelph. This archaeological assessment was conducted to determine the presence of any archaeological resources which might be extant on the property and, if so, what steps need to be taken for their management. The study was conducted in accordance with Ministry of Culture and Communications guidelines for archaeological assessments (TFSR 1992:6-9).

3.0 Location

The study area consists of a land parcel in central Moore Township in western Lambton County. The study area is basically linear in the northern part, but is enlarged in the south, where the proposed gas storage wells are to be located (Figures 2 and 3).

The proposed pipeline is to begin in Lot 19, Concession VI, and ends in Lots 19

and 20, Concessions IV and V, where it divides itself between several proposed wells.

4.0 Geography and Archaeological Potential

The subject land lies within the Carolinian Biotic Province, which is described as favouring the growth of:

...oak, hickory, maple, beech, walnut, butternut, elm, tulip, ash, basswood, sycamore and cottonwood. Cedar and tamarack are fairly common in swampy tracts. White pines and even spruce are locally numerous ... especially in the north reaches of the biome (Mason 1981:60, in Janusas 1987:3).

The physiographic region of the study area is predominately part of the St. Clair Clay Plains. Soils of the St. Clair Clay Plains are characteristically heavy in texture and poorly drained. In Lambton, they are known as the Lambton Clay Plain, and contain areas of bevelled till plains covered by a thin veneer of lacustrine clays. These conditions favour the Lambton area in contrast to the Essex region, with the former exhibiting better vegetation development and drainage features (Chapman and Putnam 1969:243). There are two soil types in the region: Brookston and Caistor clays, both of which are imperfectly drained (ibid).

The underlying bedrock of the study area is of the Upper Devonian shales of the Kettle Point and Port Lambton formations (Poole et al 1972:284). The bedrock varies in depth below the surface till, but is nevertheless deeply buried, and does not outcrop.

The archaeological potential of the lands were assessed using their soils, hydrology, and landforms as considerations. According to Janusas: "The location of early settlements tended to be dominated by the proximity to a reliable and potable water resource..." (1988:1). The study area has no obvious sources, using the NTS 1:50,000

topographic map. The soils, being imperfectly drained, and the proximity to water sources imply a moderate potential for prehistoric archaeological sites (see Appendix One).

The potential for historic sites is high in the study area. According to historical sources, the study area was settled by Europeans in the mid-nineteenth century. Among the first settlers were British and North American farmers who settled along the available concession roads (Phelps 1973:70). The nearest large settlement is Courtright, which was settled first by Francis Decatur before 1800, but was not an established town until the establishment of the Canada Southern Railway (modern Highway 80 follows the old railbed) (ibid:17). Most of the 1880 atlas subscribers in the study area arrived in Moore Township between 1848 and 1877 (ibid:70).

5.0 Background Research

Archival research was conducted using the Ministry of Culture and Communications site data files in order to determine the presence of any known heritage resources which might be located in the study area. It was found that in the study area there are no registered archaeological sites, and no sites are located within three kilometres.

Given that the study area has a no known archaeological sites, and exhibits moderate to high archaeological potential for yet undiscovered archaeological remains, then it is anticipated that any selected preferred pipeline routes may impact unknown sites. Of course, if the preferred routes are aligned within already disturbed lands (ie. road allowances, or other pipeline easements), then the negative impacts of the proposed pipeline on archaeological heritage will be greatly lessened. It is suggested, that based

on past studies, and using some models of archaeological site potential (Peters 1986; Pihl 1986), most prehistoric archaeological sites will be found within 150 metres of remnant or extant water sources. However, non-habitation sites (ie. burials, resource gathering sites, and kill sites), may be located anywhere. Historic sites tend to be near the transportation routes of the study area, namely: post-1850 sites are located along the historically surveyed roads. In September 1992 Archaeological Research Associates Ltd. conducted a Stage 1, background study, of the study area (ARA 1992), and recommended that further archaeological studies were warranted for the study area. These studies are the subject of this report.

6.0 Methodology

Since the study area is comprised of both ploughed and unploughed lands, the methodologies for conducting the archaeological field assessment were twofold.

Those areas which had been agriculturally worked were visually surveyed at five to 10 meter intervals. In this study, these lands consisted of newly planted winter wheat, standing corn, newly cut forage, soy bean stubble and freshly ploughed fields.

Those areas which were not cultivated (woodlots) were assessed by use of shovel test pitting at five to ten meter intervals. In test pitting, a small (30 cm) pit is hand shovelled to the depth of the underlying subsoil. The contents of this pit are screened through 6 mm mesh.

For both methodologies, if artifacts are encountered (ie. bone, ceramics, metal, stone tools or debitage, glass, charcoal, etc.), then pedestrian and/or test pit intervals are reduced to one meter around the findspot. This intensive secondary searching is used to help delineate the size of the cultural deposit. If deemed necessary, the surface

artifacts of a discovered site are collected and mapped with a fixed datum and transit. In unploughed areas, sites are delineated using a transit and a fixed grid, and a series of test squares. All artifacts collected assist in the evaluation of the significance of the cultural remains.

7.0 Results

In sum, four areas of archaeological interest were discovered during the archaeological assessment conducted by Archaeological Research Associates Ltd. Three of these were found within the storage pool area in the southern portion of the study area, while the fourth was found just to the north of the study area (Figure 3). Previous soil disturbances were observed throughout the study area (Figure 3), and include, road allowances, hydro corridors, gas pipelines, and a late 19th century railbed.

Two of the four areas of archaeological interest are considered important sites, and have been given the designation numbers AeHo-19, and AeHo-20, and registered with the Ministry of Culture and Communications. A brief description of all four archaeological sites is given below:

7.1 Tecumseh A (AeHo-19)

This site consists of a dense surface scatter of domestic and structural debris (20 x 20 metres) from a farmhouse dating to the last decade of the 19th century, and terminating to a period just after the Second World War. The site is currently being ploughed on a semi-annual basis for cash crops. A small collection (46 artifacts) of surface remains were taken for analysis. A catalogue list for the site is found in Appendix Two. Of note at this site were hundreds of red brick fragments, most likely the exterior architectural remains of this house.

7.2 Tecumseh B

This site is also a dense surface scatter (20 x 20 metres), but unlike Tecumseh A, this site dates to a much later period, circa 1920-1970. The surface artifacts included coal, wire, lumber, plastic, concrete, and assorted 20th century domestic debris. Because of its recent age, this site is not considered significant.

7.3 Tecumseh C (AeHo-20)

This site was discovered in a field directly north of Tecumseh A, but on the other side of Highway 80. It consists of a scatter of domestic debris (20 x 20 metres) found in the surface soil of a forage crop. Observed remains included white ironstone, stoneware crockery, ball clay pipe stems (Bannerman/Montreal), and glazed red earthenware. Using the observed remains, we have dated this site to c.1870-1890, based primarily on the paucity of typical early 20th century artifacts.

7.4 Tecumseh D

This site is dissimilar to the other three, in that it is located away from any roads. It consists of a dense scatter of domestic debris (primarily bottle glass) over an area of approximately 30 x 20 metres. The materials observed were typical threaded-topped bottles and jars. Most of the material dates to the middle of the 20th century or earlier. Ceramics observed were white ironstone, lustreware, stoneware, purple printed or green printed earthenwares, and flowblue ware. Based on location, we are interpreting this site as a 20th century midden, not a habitation site, and it is not considered significant.

8.0 Conclusions and Recommendations

The archaeological assessment of the study area has resulted in the identification of four archaeological sites. Two of these (AeHo-19 and AeHo-20) are considered significant because they represent two 19th century farmsteads. The historic Euro-Canadian settlement of this portion of Lambton County occurred in the last half of the 19th century (Phelps 1973). Although other areas of the province were settled more than 50 years before this period, these sites represent the initial homesteads of the lots in which they are located.

We recommend that further archaeological studies are needed only to assist in protecting against negative heritage resource impacts along the proposed preferred

installation routes of pipelines, roads and wells in the vicinity of the two sites (AeHo-19 and AeHo-20). Should the proposed impacts (pipeline installation, access road building, and well drilling), avoid these two sites then no further archaeological studies are required. However if the two sites cannot be avoided, then archaeological work should include: a controlled surface collection of the surface artifacts, followed by; the monitoring of the sites while the nearby pipelines, roads and wells are installed. From these studies the results should provide a more complete interpretation of the early farming families of the late 19th century in Moore Township.

The archaeological assessment of the Ladysmith study area has resulted in the discovery of limited archaeological remains. However, if any, unforeseen, deeply buried cultural remains are encountered during future gas pipeline and/or well, or road installation, then the Ministry of Culture and Communications, and Archaeological Research Associates Ltd. should be immediately contacted.

9.0 References Cited

Archaeological Research Associates Ltd. (ARA)

1992 Archaeological Assessment, Stage 1: Background Study, Tecumseh Gas Storage Ltd., Proposed Ladysmith Project, Moore Township, County of Lambton. Report on file Ministry of Culture and Communications, London and Toronto.

Chapman, L.J., and D.F. Putnam

1966 The Physiography of Southern Ontario. University of Toronto Press, Toronto.

Janusas, S.E.

1987 An Analysis of the Historic Vegetation of the Regional Municipality of Waterloo. Regional Municipality of Waterloo.

1988 The Cultural Implications of Drainage in the Municipality of Waterloo. Regional Municipality of Waterloo.

1991 Archaeology Brochure from the Archaeology Division, Regional Municipality of Waterloo, Planning and Development Department.

Mason, R.

1981 Great Lakes Archaeology. Academic Press, New York.

Murphy, C., and N. Ferris

1990 The Late Woodland Western Basin Tradition in Southwestern Ontario. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:189-278.

Peters, J.

1986 Transmission Line Planning and Archaeological Resources: A Model of Archaeological Potential for Southwestern Ontario. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:19-28.

Phelps, E.

1973 Belden's Illustrated Historical Atlas of the County of Lambton Ontario, 1880. Port Elgin, Ontario. (Reprint of original).

Pihl, R.

1986 Site Potential Modelling in Archaeological Consulting. Archaeological Consulting in Ontario: Papers of the London Conference 1985. Edited by W.A. Fox, Occasional Papers of the London Chapter, Ontario Archaeological Society Inc. Number 2:29-40.

Poole, W.H., B.V. Sanford, H. Williams, and D.G. Kelley

1972 Geology of Southeastern Canada. Geology and Economic Minerals of Canada. Edited by R.J.W. Douglas. Geological Survey of Canada, Economic Geology Report No. 1, Dept. of Energy, Mines and Resources, Ottawa. pp. 227-304.

Spence, M.W., R. Pihl, and C. Murphy

1990 Cultural Complexes of the Early and Middle Woodland Periods. The Archaeology of Southern Ontario to A.D. 1650. Edited by C.J. Ellis and N. Ferris, Occasional Publication of the London Chapter, OAS Number 5:125-170.

TFSR (Task Force on Self Regulation)

1992 Archaeological Assessment Technical Guidelines: April 1992. Arch Notes. 92-3:6-19.

10.0 Acknowledgements

The study of the proposed pipeline study areas was made possible with the support of Ed Mozuraitis of Ecological Services for Planning Ltd., with additional assistance from the staff of Tecumseh Gas Storage Ltd.

SOUTHERN ONTARIO
COUNTIES AND GEOGRAPHICAL TOWNSHIPS

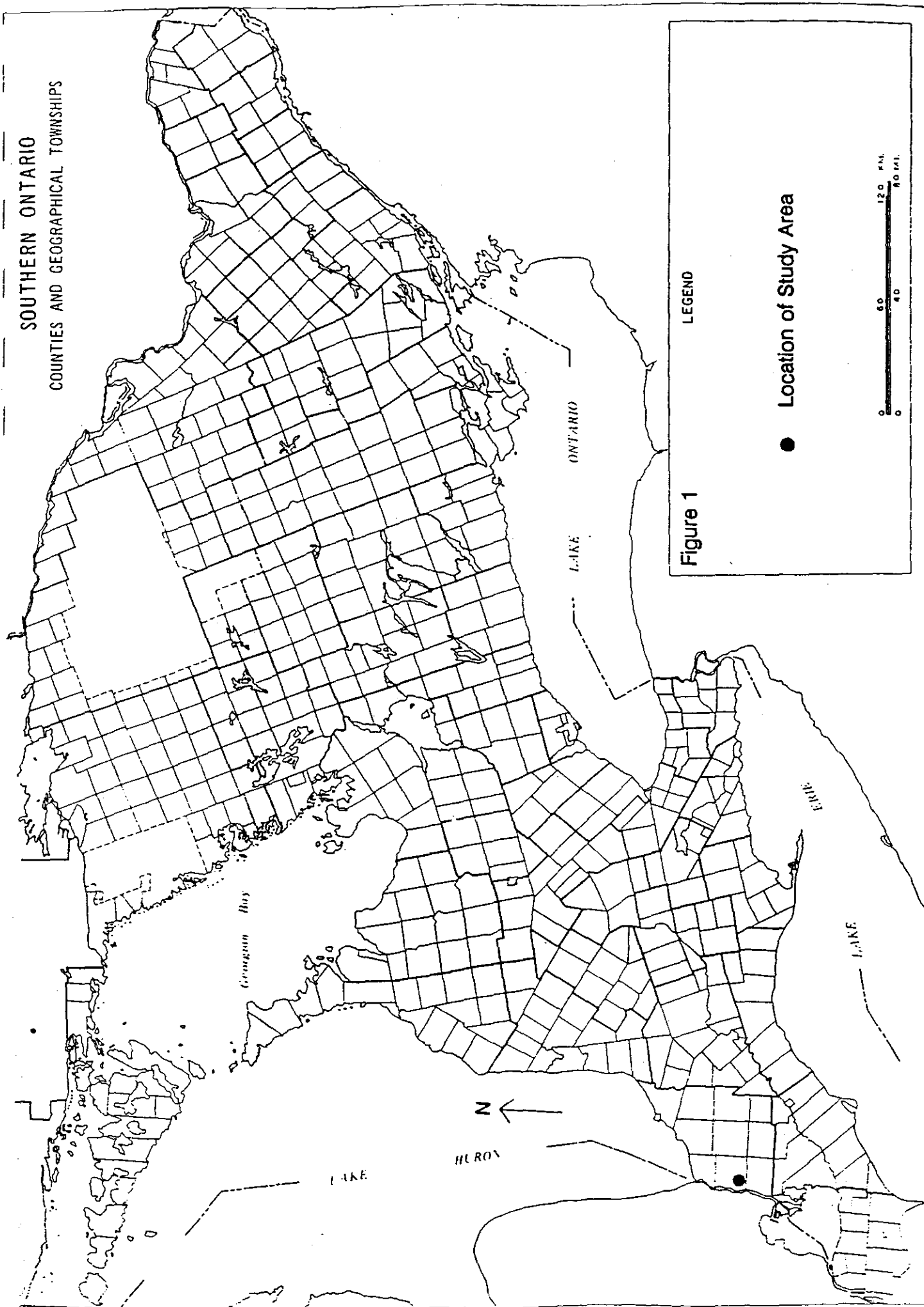
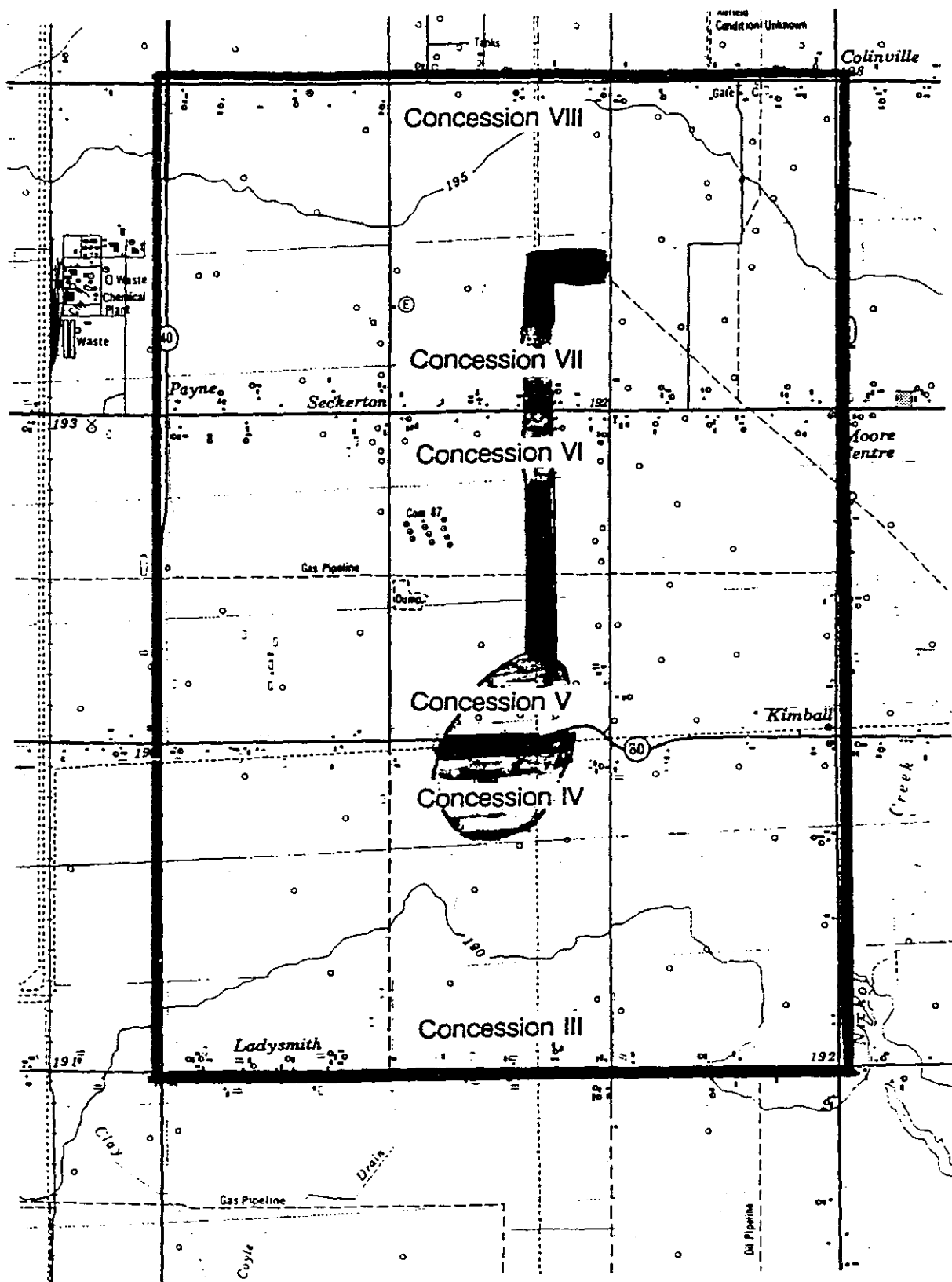


Figure 1

LEGEND

● Location of Study Area

0 60 120 KM
0 40 80 MI



Location of Study Area



N

Scale 1:50,000

Figure 2

Tecumseh Gas Storage Ltd.
Ladysmith Project

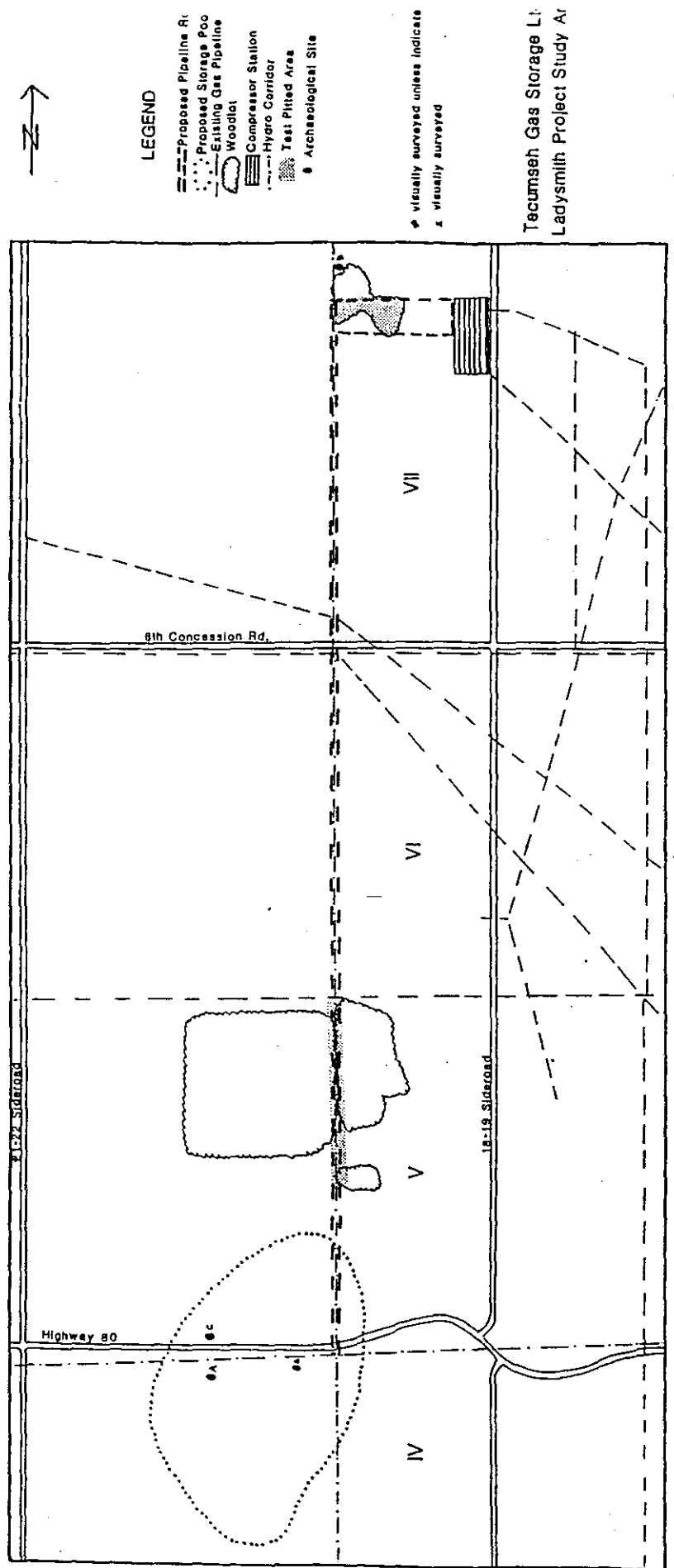


Figure 3

Appendix One

CULTURAL CHRONOLOGY FOR SOUTH WESTERN ONTARIO

| <u>Period</u> | <u>Group</u> | <u>Time Range</u> | <u>Comment</u> |
|---------------|-----------------------------|---------------------|--|
| PALEO-INDIAN | | | |
| | Fluted | 9500 - 8500 B.C. | Big Game hunters; small, nomadic groups |
| | Hi-Lo | 8500 - 8000 B.C. | |
| ARCHAIC | | | |
| Early | Side-notched | 8000 - 7700 B.C. | Nomadic hunters and gatherers |
| | Corner-notched | 7700 - 6900 B.C. | |
| Middle | Bifurcate Points | 6900 - 6000 B.C. | Transition to territorial settlements |
| | Stemmed Points | 6000 - 3500 B.C. | |
| | Notched Points | 3500 - 2500 B.C. | |
| WOODLAND | | | |
| Early | Meadowood | 900 - 400 B.C. | Introduction of pottery |
| Middle | Adena | 400 B.C. - A.D. 1 | |
| | Couture/ Riviere au Vase | 300 B.C. - A.D. 500 | |
| | Riviere au Vase | A.D. 500 - 900 | |
| Late | Younge | A.D. 900 - 1300 | Incipient horticulture Transition to village life and agriculture Establishment of large palisaded villages Tribal differentiation and warfare |
| | Springwells | A.D. 1300 - 1400 | |
| | Wolf | A.D. 1400 - 1650 | |
| HISTORIC | | | |
| Early | Historic Native | A.D. 1700 - 1875 | Tribal displacements |
| Late | Euro-Canadian | A.D. 1800 - present | European settlement |

(From: Janusas 1991; Murphy and Ferris 1990:196; Spence et al 1990:144)

Appendix Two

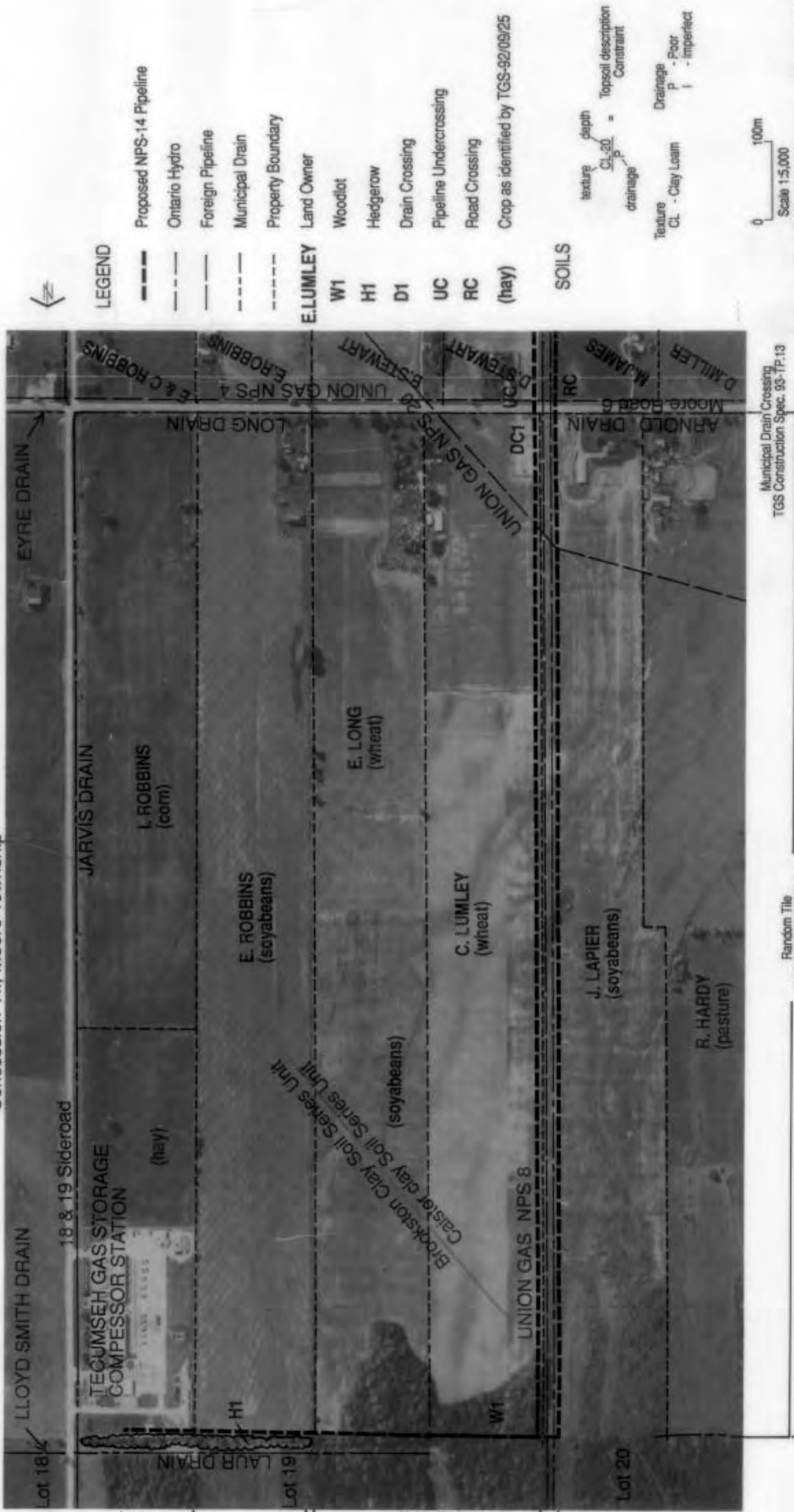
Artifact Registry

Tecumseh A (AeHo-19) Surface Remains

| <u>Artifact Number</u> | <u>Quantity</u> | <u>Class</u> | <u>Comments</u> |
|------------------------|-----------------|--------------------------------|------------------------|
| 1-5 | 5 | clear bottle glass | 1 pressed crystal |
| 6 | 1 | green bottle glass | base="HAM..." |
| 7 | 1 | brown bottle glass | top; seamless lip |
| 8 | 1 | blue bottle glass | top; applied lip |
| 9-12 | 4 | purple bottle glass | 2 tops; 1 seamless |
| 13 | 1 | melted glass | |
| 14-15 | 2 | glass fuses | CGE & FILE brands |
| 16 | 1 | glass marble | all blue |
| 17-19 | 3 | press green milk glass | 1 base |
| 20-24 | 5 | white ironstone | 3 edges |
| 25 | 1 | white ironstone (Seashells) | edge |
| 26-27 | 2 | white earthenware | 1 edge |
| 28-29 | 2 | white milk glass | 1 rim |
| 30 | 1 | banded white ironstone | green & orange stripes |
| 31 | 1 | lustreware | edge |
| 32 | 1 | multi-coloured stoneware | figural |
| 33 | 1 | orange glazed earthenware | |
| 34 | 1 | St. Johns ware | edge |
| 35 | 1 | red printed earthenware | |
| 36-39 | 4 | blue willow ware | 1 base |
| 40-42 | 3 | dark green printed earthenware | 1 handle; 1 edge |
| 43 | 1 | brown glazed red earthenware | lid edge |
| 44 | 1 | coal | |
| 45-46 | 2 | bullet casings | .32 centre fire |

APPENDIX E

Environmental Resources and Impact Mitigation Photomosaics



LEGEND

- Proposed NPS-14 Pipeline
- Ontario Hydro
- Foreign Pipeline
- Municipal Drain
- Property Boundary

E.LUMLEY

W1

H1

D1

UC

RC

(hay)

SOILS

texture depth
CL-20 = Topsoil description
drainage P Constraint
Texture CL - Clay Loam Drainage P - Poor
I - Imperfect

0 100m
Scale 1:5,000

Prepared for TECUMSEH GAS STORAGE - January, 1993



ENVIRONMENTAL
RESOURCES
AND IMPACT
MITIGATION

Project
GP066

Photomosaic No. 1

Random Tile
TGS Construction Spec.
93-TP.18

CL-20

TGS Construction Spec. 93-TP.4

TGS Construction Specs.

93-TP.1, 93-TP.3, 93-TP.5, 93-TP.6,
93-TP.7, 93-TP.15, 93-TP.17
(See Appendix G)

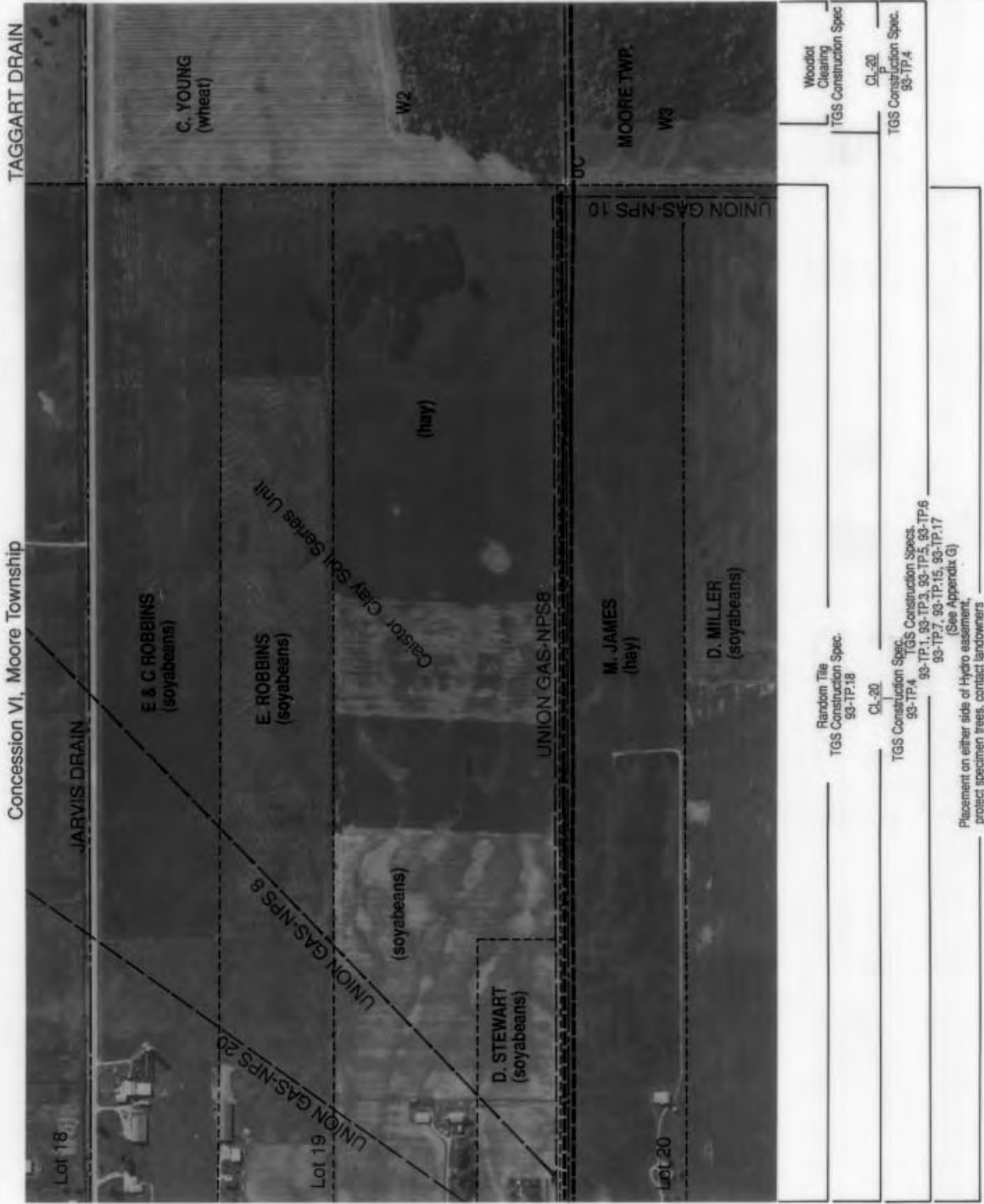
Systematic Tile
TGS Construction Spec. 93-TP.18

CL-20

Woodlot Clearing
TGS Construction Spec.
93-TP.2

TGS Construction Spec. 93-TP.4

TGS Construction Specs. 93-TP.1, 93-TP.3, 93-TP.5, 93-TP.6, 93-TP.7, 93-TP.15, 93-TP.17
(See Appendix G)



LEGEND

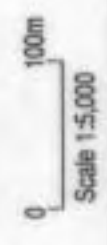
- Proposed NPS-14 Pipeline
- Ontario Hydro
- Foreign Pipeline
- Municipal Drain
- Property Boundary

E.LUMLEY

- Land Owner
- W1 Woodlot
- H1 Hedgerow
- D1 Drain Crossing
- UC Pipeline Undercrossing
- RC Road Crossing
- (hay) Crop as identified by TGS-92/09/25

SOILS

texture depth
CL-20 = Topsoil description
drainage P Constraint
Texture CL - Clay Loam Drainage P - Poor
I - Imperfect



Prepared for TECUMSEH GAS STORAGE - January, 1993



ENVIRONMENTAL
RESOURCES
AND IMPACT
MITIGATION

Project
GP066

Photomosaic No. 2

Random Tile
TGS Construction Spec.
93-TP.18

CL-20
TGS Construction Spec.
93-TP.4

Woodlot
Clearing
TGS Construction Spec.
93-TP.4

CL-20
TGS Construction Spec.
93-TP.4

93-TP.1, 93-TP.3, 93-TP.5, 93-TP.6
93-TP.7, 93-TP.15, 93-TP.17
(See Appendix G)

Placement on either side of Hydro easement,
protect specimen trees, contact landowners
before construction for tile locations

Concession V, Moore Township

Concession IV, Moore Township



LEGEND

Proposed NPS-14 Pipeline

Ontario Hydro

Foreign Pipeline

Municipal Drain

Property Boundary

Land Owner

W1

Woodlot

H1

Hedgerow

D1

Drain Crossing

UC

Pipeline Undercrossing

RC

Road Crossing

(hay)

Crop as identified by TGS-92/09/25

SOILS

texture

depth

CL-20

=

Topsoil description

Constraint

drainage

P

Texture

CL

- Clay Loam

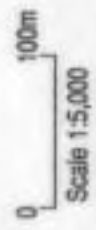
Drainage

P

- Poor

I

- Imperfect



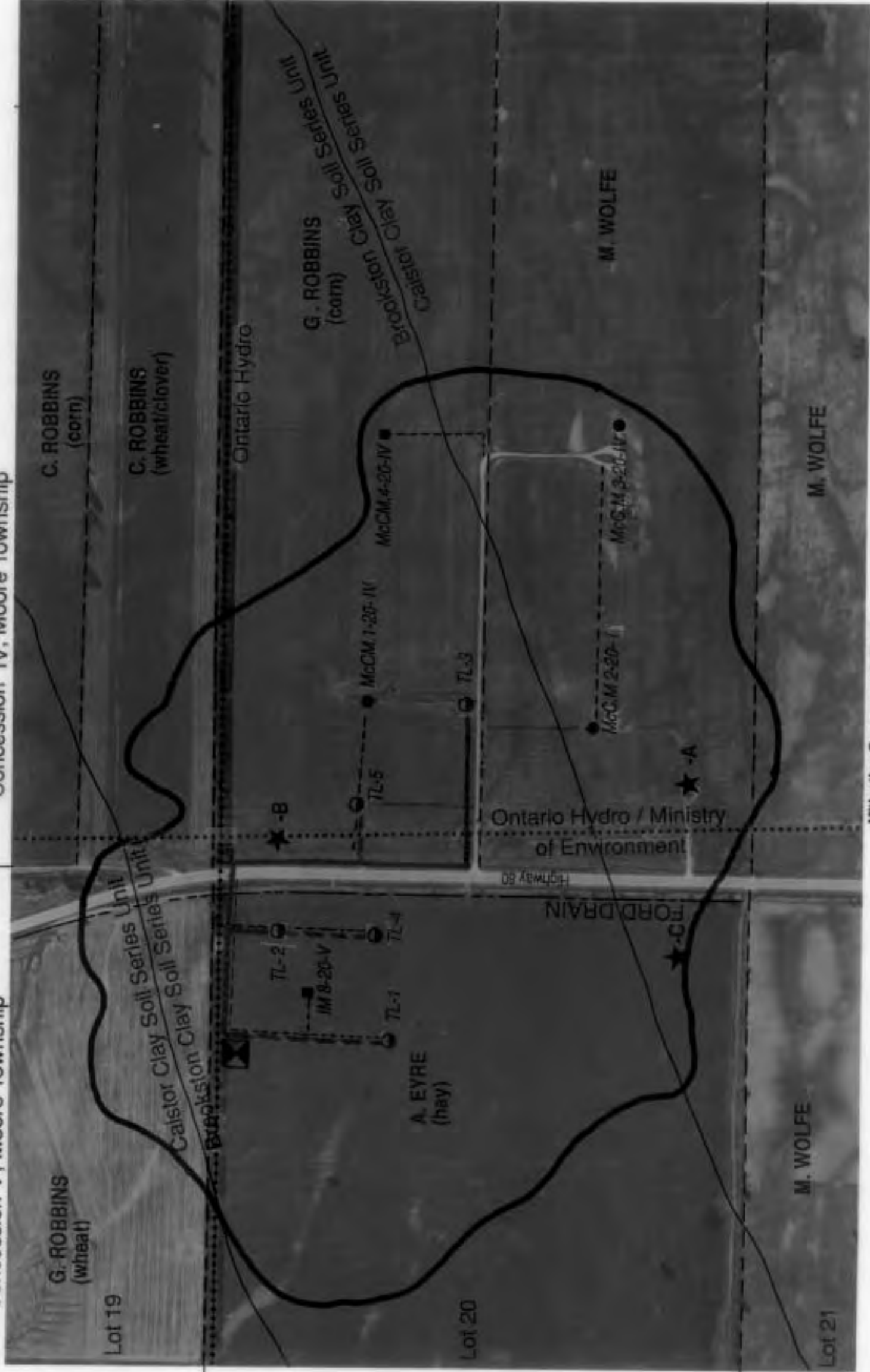
ENVIRONMENTAL
RESOURCES
AND IMPACT
MITIGATION

Prepared for TECUMSEH GAS STORAGE - January, 1993

| | | |
|--|---|--|
| Woodlot Clearing TGS Construction Spec. 93-TP.2 | Contact A.Eyre for tile drain locations, place pipeline between tile | |
| Minimize clearing, consider spoil placement on Hydro ROW | Systematic Tile TGS Construction Spec. 93-TP.18 | |
| CL-20 TGS Construction Spec. 93-TP.4 | CL-25 TGS Construction Spec. 93-TP.4 | |
| TGS Construction Specs. 93-TP.1, 93-TP.3, 93-TP.5, 93-TP.6 93-TP.7, 93-TP.15, 93-TP.17 (See Appendix G) | | |

Concession V, Moore Township

Concession IV, Moore Township



LEGEND

- Proposed Storage Well Location
- Storage Observation Well
- Oil Well
- New Access Roads Required
- Approximate Boundary of Storage Pool
- Dehydrator & Valve Area
- NPS 14 Gathering Lines
- Archaeological Sites (See Section 8.2.5 and Appendix D)
- NPS 8 Gathering Lines

**Final location of Access Roads to be determined through discussions with landowners prior to construction.

0 100m
Scale 1:5,000

Prepared for TECUMSEH GAS STORAGE - January, 1993



PROPOSED LAYOUT OF LADYSMITH STORAGE POOL, WELL SITES, ACCESS ROADS AND GATHERING SYSTEM

Project
GP066

Photomosaic No. 4

Mitigation Recommendations

- Bore under Highway 80 and Ford Drain
 - NPS 14 pipeline location between hydro easement and Highway 80
 - Locate NPS 14 pipeline between North/South tile on A. Eyre Property
- Access Road Construction - See Appendix F, preserve topsoil, store and respread on site
- Pipeline Gathering System - see Section 5.1, 5.2 and Appendix G
- Well Drilling - see Appendix F mitigation

APPENDIX F

TGS Environmental Guidelines for Well Drilling
and Site Restoration and Permanent Access Road Specification

ENVIRONMENTAL GUIDELINES FOR WELL DRILLING AND SITE RESTORATION

GENERAL

1. All well drilling and associated activities shall be conducted in a way to avoid environmental impacts to soils, tile drainage, vegetation, wildlife and water resources.

SITE PREPARATION

2. Prior to moving drilling equipment to the drill site, a temporary all-weather drilling pad and access road shall be constructed to minimize soil damage and facilitate movement of heavy equipment.
3. Geotextile material shall be laid over the temporary access road right-of-way, all traffic areas of the drill site on undisturbed topsoil and covered by a 75 mm layer of Granular "A" crushed stone. In areas where surface drains are crossed, culverts sized to accommodate maximum anticipated flows shall be installed to facilitate drainage across the road.
4. Where future operations require all season access to the storage or observation wellhead, a permanent access road, (following Specification for Permanent Access Roads), shall be constructed to the wellsite before drilling equipment is moved on site.
5. Where practical, steel tanks shall be erected on site to contain drilling fluids and drill cuttings.

PIT EXCAVATIONS

6. Where steel tanks cannot be used or are impractical, earthen drilling pits shall be excavated large enough to handle the volume of fluids anticipated during drilling operations with a freeboard level of one metre.
7. Topsoil shall be stripped at all pit excavations and stored separately from subsoil for subsequent replacement. The spoil banks should be situated in a nearby location that minimizes handling and facilitates backfilling.
8. Any earthen pits used to contain drilling fluids shall be lined with a synthetic liner to contain the fluids and eliminate seepage into surrounding soils.
9. For drill sites situated on sloping grade, the sump shall be located on the high side and a containment berm shall be constructed on the low side of the site to prevent run off of drilling fluids.
10. Where required, a flare pit shall be excavated no closer than 35 metres from any ignition source and located where prevailing

winds reduce fire hazard. The pit shall be large enough to contain the maximum expected flare during drilling.

11. Any drainage tile cut during excavations shall be properly marked (flagged) to ensure their repair after drilling is completed. All open tile shall be temporarily plugged to prevent debris and fluids from entering the tile. All tiles cut shall be recorded, by location. Any main tile runs, or high flow tiles, shall be either temporarily bridged, or re-routed to maintain flow during construction.

DRILLING OPERATIONS

13. Movement of all equipment shall be restricted to the access road and gravel drilling pad. Under no circumstances shall surrounding fields be used for vehicular movement.
14. Drilling sites and right-of-ways shall be kept free of trash and litter at all times. Proper waste receptacles must be on site to collect the wastes.
15. All gas encountered during drilling shall be flared at the flare pit. Proper notification to the local police, fire department, landowners and industry shall be given prior to flaring.

DRILLING FLUIDS DISPOSAL

16. After well drilling has been completed, the sump drilling fluids and solids shall be disposed of in a proper manner.
17. If present, free crude oil shall be skimmed from the surface of the sump and hauled to Tecumseh oil production facilities for recovery.
18. Water-based sump liquids shall be recovered and disposed of off site by disposal well, retention pond or other means approved of by TGS management. For multi-well drilling programs, sump liquids should be recycled to other drill sites.
19. Drill cuttings and sludge shall be solidified using a commercially available bonding agent. Leachate samples shall be collected and analyzed to determine the chemical content and suitability for disposal, prior to hauling offsite to an approved landfill.

SITE RESTORATION

20. The drill site and right-of-way shall be cleaned of all trash including thread protectors, lumber, pipe scraps and other waste material.

-
21. All earthen pits shall be void of drilling fluids and debris including the synthetic liner prior to backfilling.
 22. Backfilling shall be scheduled during dry weather and when pits have been given adequate time to dry out. If pits are to remain open temporarily, adequate fencing shall be installed for safety and protection of livestock and wildlife.
 23. All pits shall be backfilled with the original excavated material. The soil contour shall be restored to original and built up above surrounding site level to allow for future subsidence.
 24. The temporary gravel pad and geotextile material shall be removed, excepting the immediate wellhead area, approximately 7 m x 7 m square. The drill site shall be contoured to its original grade excepting the built up pit areas. If required, the subsoil base shall be chisel ploughed to alleviate compaction.
 25. Topsoil replacement shall be scheduled during dry soil conditions. The topsoil shall be uniformly replaced and restored to original depth. After topsoil replacement, the site shall be disced and revegetated in consultation with the landowner.
 26. All tile drain repairs will be completed as soon as possible in accordance with TGS Tile Repair Specifications.

PERMANENT ACCESS ROAD SPECIFICATIONS

1. Permanent access roads are to be located to minimize disturbance of agricultural cultivation practices and to minimize damage to existing drainage tiles. The location of the access road shall be determined in consultation with the landowner and/or tenant.
2. Existing access roads and linear severances (lot lines, etc.) shall be used where possible.
3. In systematically drained fields, subject to landowner approval, the road shall be orientated so it runs perpendicular to or in between the tile runs. Subject to the opinion of a drainage tile expert and consultation with the landowner, header tile shall be installed adjacent to the road to maintain drainage where required.
4. The topsoil shall be stripped over a road width of seven metres (23 ft) to a minimum depth of 150 mm (6"). The topsoil shall be stockpiled near the well site and reclaimed after construction or hauled to another suitable location (on the landowners property if possible).
5. The subsoil shall be graded to form a crown along the centre of the roadbed tapering off towards the edges for water runoff. The edges of the roadbed shall be contoured into a "vee" shaped ditch to a minimum depth of 305 mm (12").
6. Culverts shall be installed across the roadway as required to maintain existing surface drainage patterns. If necessary, new drainage tile and/or catch basins shall be installed and connected to existing drainage tile to prevent ponding along the edge of the roadway.
7. Geotextile material shall be laid under the roadbed over a width of five metres. The geotextile material provides a more stable road, which is less prone to shifting and rutting, by creating an equal weight distribution over the roadbed and preventing burial of granular material in the subsoil.
8. A 75 mm (3") layer of $\frac{3}{4}$ " clear granular shall be spread uniformly on top of the geotextile followed by a second 75 mm layer of Granular "A" crushed stone.

APPENDIX G

TGS Pipeline Construction Specifications

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

| | |
|----------|---|
| 93-TP.1 | General |
| 93-TP.2 | Clearing |
| 93-TP.3 | Fences |
| 93-TP.4 | Soil Handling |
| 93-TP.5 | Grading |
| 93-TP.6 | Unloading, Hauling, Stringing and Storing |
| 93-TP.7 | Trenching |
| 93-TP.12 | Highway, Roadway and Railway Crossings |
| 93-TP.13 | Drain and Creek Crossings |
| 93-TP.15 | Backfill |
| 93-TP.16 | Hydrostatic Strength, Leak Test and Pigging |
| 93-TP.17 | Clean-up and Restoration |
| 93-TP.18 | Drainage Tiles |

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.1 - General

Environment

TP.1.1

Tecumseh Gas Storage has incorporated practical environmental guidelines into these construction specifications to ensure adverse environmental effects are minimized through conscientious planning, implementation of effective protection measures and compliance with government regulations and standards. It is the responsibility of the CONTRACTOR to ensure that all personnel are suitably aware of the specifications and that all construction activities are carried out in a manner consistent with those specifications.

Wet Soils

TP.1.2

The CONTRACTOR should be aware that a Wet Soil Shutdown Policy shall be in effect throughout the construction project. As it is the intent of the COMPANY to minimize damage to the topsoil, the CONTRACTOR will be requested to suspend operations during and after periods of heavy rain. See specification TP.4.2.5.

Work Area

TP.1.3.1

All construction activities are to be confined to the limits of the easement. Where additional working areas are required, such as at road or watercourse crossings, the WORK shall be confined to the minimum practicable area and a temporary easement agreement shall be obtained with the LAND OWNER prior to construction.

TP.1.3.2

The edges of the right-of-way shall be staked by the COMPANY, but the CONTRACTOR may be required to install temporary fencing in certain areas to reduce the possibility of equipment trespass. The CONTRACTOR shall direct all personnel to observe the limits of the right-of-way at all times.

Work Length

TP.1.4

The length of the construction spread shall be controlled by the COMPANY in accordance with local conditions. In no case shall the length of continuous open trench exceed three kilometres. It is the COMPANY'S intent to ensure that backfilling, compaction and restoration of the trench is completed as quickly as possible. All structures are to be as-built surveyed by the COMPANY, therefore sufficient time should be allowed before backfilling.

Work Hours

TP.1.5

Working hours of crews are to be arranged so that construction activities have a minimal effect on nearby residents. Special attention shall be made to the operational times of heavy construction equipment and boring machines.

Access

TP.1.6

Access to the easement shall be from sideroads and concession roads unless an alternate route has been approved by the COMPANY and consent has been obtained from the LAND OWNER or TENANT to use that route. Access to the easement across drains or creeks shall be attained by constructing a temporary bridge as outlined in the Drain and Creek Crossings Specification 93-TP.13.2.12. Natural drainage shall be maintained at all times.

Road Damage

TP.1.7

The CONTRACTOR shall minimize damage to local municipal roads caused by the movement of construction equipment. Where damage occurs as a direct result of construction activity, the CONTRACTOR shall restore the road to a condition satisfactory to the Township Engineer and the COMPANY. In addition, all mud and large clumps of earth shall be cleaned from public roads as required.

Dust Control

TP.1.8

The CONTRACTOR is responsible for control of nuisance dust and shall be prepared to carry out remedial measures such as the application of calcium chloride water on road surfaces.

Fuelling

TP.1.9.1

All equipment fuelling and maintenance activities shall be carried out at locations approved by the COMPANY and in such a manner so as to avoid contamination of the water table, soils or watercourses. See the Drain and Creek Crossings Specification TP.13.2.3.

TP.1.9.2

The CONTRACTOR shall immediately notify the COMPANY of any spills of oil, gasoline diesel or other hazardous materials regardless of the quantity spilled. The COMPANY must notify the MOE Spills Action Centre of ALL spills regardless of how minor.

Litter

TP.1.10

All excess construction materials and litter shall be contained and deposited in barrels located at suitable intervals along the easement. They shall be regularly cleaned during construction and removed at the termination of the project. See the Clean-up and Restoration Specification TP.17.

Fires

TP.2.2.7 Fires shall not be permitted at any time on the right-of-way during the course of the WORK.

Safety Measures

TP.2.2.8 The CONTRACTOR shall furnish and maintain all necessary day and night warning signs, flares, lanterns, barricades and flag-persons when working on or near roads, highways, railroads or other traffic ways to protect all persons and property from injury and to warn the drivers of vehicles of the obstruction.

TP.2.3 Basis for Payment

TP.2.3.1 The work described in this section will be paid for as part of the Proposal. There will be no separate payment for Clearing.

TP.2.3.2 A separate payment will be made for the cutting and removal of merchantable timber.

TP.2.3.3 A separate payment will be made for tree replacement or transplanting when requested by the COMPANY.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.3 - Fences

TP.3.1 Work Covered

This shall include work on all fences on the right-of-way which must be cut to permit passage of equipment onto or along the right-of-way.

It shall also include any gates or fence gaps required to be constructed as a result of fences being cut and the 24 hour maintenance of those gates or gaps.

TP.3.2 Construction Procedure

Compliance

TP.3.2.1 Before work on a fence is started, the CONTRACTOR shall comply and become familiar with all special provisions included in the right-of-way easements secured by the COMPANY.

Gates or Gaps

TP.3.2.2.1 The CONTRACTOR, having first ascertained from the COMPANY that permission has been secured from the LAND OWNER, shall furnish materials for and install a suitable, substantial gate or gap in every fence which must be cut. All gates shall be constructed in a manner acceptable to the ENGINEER.

TP.3.2.2.2 Gates shall be constructed so that they can be securely closed. They shall be the type specified by the ENGINEER and shall satisfy the LAND OWNER and/or TENANT.

TP.3.2.2.3 To minimize damage to any fence on the right-of-way, the CONTRACTOR shall brace and reinforce the fence on each side of the proposed gap before cutting the fence.

Safety

TP.3.2.3 The CONTRACTOR shall furnish a watchman to maintain these gates where necessary to prevent livestock from entering or leaving the property or in any other instance required by the LAND OWNER and/or TENANT.

Restoration

TP.3.2.4 At the conclusion of the project, the CONTRACTOR shall undertake the restoration of all fences to their original condition and to the reasonable satisfaction of the LAND OWNER and/or TENANT. This shall also include all labour and materials required for the reconstruction of any antique fences (stone, cedar, etc) damaged during construction.

TP.3.3 Basis of Payment

- TP.3.3.1 The labour described in this section will be paid for as a part of the proposal. There will be no separate payment for Fences.
- TP.3.3.2 The COMPANY shall furnish all wire, posts, nails, stone, cedar or other material for construction of temporary gates and the repair of existing fencing.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.4 - Soil Handling

TP.4.1 Work Covered

This shall include work required to strip and replace topsoil over all areas to be graded or excavated.

TP.4.2 Construction Procedure

The CONTRACTOR shall minimize damage to topsoil from mixing and compaction by complying with the following procedures:

Soil Stripping

TP.4.2.1.1 Prior to trenching and grading in cultivated areas, topsoil shall be stripped throughout the full width of the trench and for a distance of 2 metres on the spoil side of the easement. The topsoil shall be piled within a 4 metre wide area extending from the exposed area of subsoil to the edge of the easement. The subsoil removed during trenching operations shall be piled within the 2 metre area between the trench and the topsoil spoil bank. Refer to Figure 4.2-A, Proposed Method.

TP.4.2.1.2 The COMPANY may direct that ONLY the topsoil directly over the width of the trench be stripped and piled in a 4 metre wide topsoil spoil bank on the edge of the easement. The subsoil removed during trenching operations would then be piled directly on the undisturbed topsoil between the trench and the topsoil spoil bank. Refer to Figure 4.2-B, Alternative Method.

TP 4.2.1.3 The topsoil shall be stripped in all areas to be graded and at all bored crossings. Extra work area shall be provided by the COMPANY to the CONTRACTOR in these locations to store and separate topsoil from the subsoil spoil bank.

TP.4.2.1.4 The COMPANY shall determine the actual depth and location of topsoil to be removed. Under no circumstances shall the stripping exceed the topsoil thickness.

TP.4.2.1.5 Topsoil stripping and replacement should be carried out when the soil is relatively dry so that soil structure is preserved.

Spoil Banks

TP.4.2.2.1 Subsoil and topsoil must be adequately separated to ensure that soil mixing does not occur. All subsoil excavated during trenching shall be piled separately from the topsoil pile. Refer to Figures 4.2-A or 4.2-B.

- TP.4.2.2.2 In certain areas along the easement, the ENGINEER may direct the CONTRACTOR to provide and place a straw mulch, or a similar barrier, between the undisturbed topsoil and the topsoil and/or subsoil spoil banks.
- TP.4.2.2.3 In restricted areas where separation is difficult, the CONTRACTOR shall furnish and place geotextile, or a similar material, over the topsoil spoil bank to prevent mixing with the subsoil spoil bank.
- TP.4.2.4.4 Topsoil should not be piled in a manner where it is liable to increase it's water content.
- TP.4.2.2.5 Periodic gaps shall be left in both topsoil and subsoil spoil banks to maintain surface drainage patterns.
- TP.4.2.2.6 Ditches and/or berms shall be constructed where necessary to divert surface water away from the topsoil spoil piles.
- TP.4.2.2.7 Existing drains and ditches shall not be blocked by topsoil or subsoil spoil piles.

Woodlots

- TP.4.2.3 As per the Clearing Specification TP.2, where the right-of-way traverses a woodlot, the working area shall be reduced and no topsoil stripping shall be done. Subsoil and topsoil mixing shall be permitted during trenching and backfilling in woodlot areas only.

Soil Restoration

- TP.4.2.4.1 Topsoil shall not be used for padding or backfilling the trench with the exception of woodlots. See TP.4.2.3.
- TP.4.2.4.2 Once backfilling of the trench is complete the CONTRACTOR shall return the topsoil to areas from which it was removed in a condition satisfactory to the COMPANY.
- TP.4.2.4.3 Prior to replacing the topsoil, the subsoil shall be chisel ploughed to a minimum depth of 200 mm, or as otherwise specified by the ENGINEER or LAND OWNER, to reduce compaction. The COMPANY may require that a subsoiler be used to a depth of 600 mm over the entire easement if significant subsoil damage is evident.
- TP.4.2.4.4 Once the topsoil is in place, the entire easement shall be para ploughed and/or disced to further reduce soil compaction, whichever the LAND OWNER prefers.
- TP.4.2.4.5 The CONTRACTOR shall remove all loose rocks and stones 75 mm (fist size) or greater from the right-of-way after ploughing or discing.

TP.4.2.4.6 Where directed by the ENGINEER, the CONTRACTOR shall purchase and haul extra topsoil from an off-site location to the easement.

Wet Soil Shutdown

TP.4.2.5 Tecumseh's Wet Soil Shutdown Policy shall be enforced where soils are susceptible to rutting and compaction because of saturated soil conditions. Construction will not start-up again until the COMPANY has determined that the soil moisture has been lowered to a suitable level.

TP.4.3 Basis of Payment

TP.4.3.1 The work described in this Section will be paid for as part of the Proposal.

TP.4.3.2 A separate payment will be made for the purchase and delivery of extra topsoil in accordance with item Top Soil Replacement in Bid Document.

TP.4.3.3 Payment for a full stand-by day will be made to the CONTRACTOR for all work in progress, including labour and equipment, that is suspended due to Wet Soil Shutdown per TP.4.2.5.



TECUMSEH GAS STORAGE

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Pipeline Construction Specification 93-TP.4

TRENCHING DETAIL

Figure 4.2-A

PROPOSED METHOD

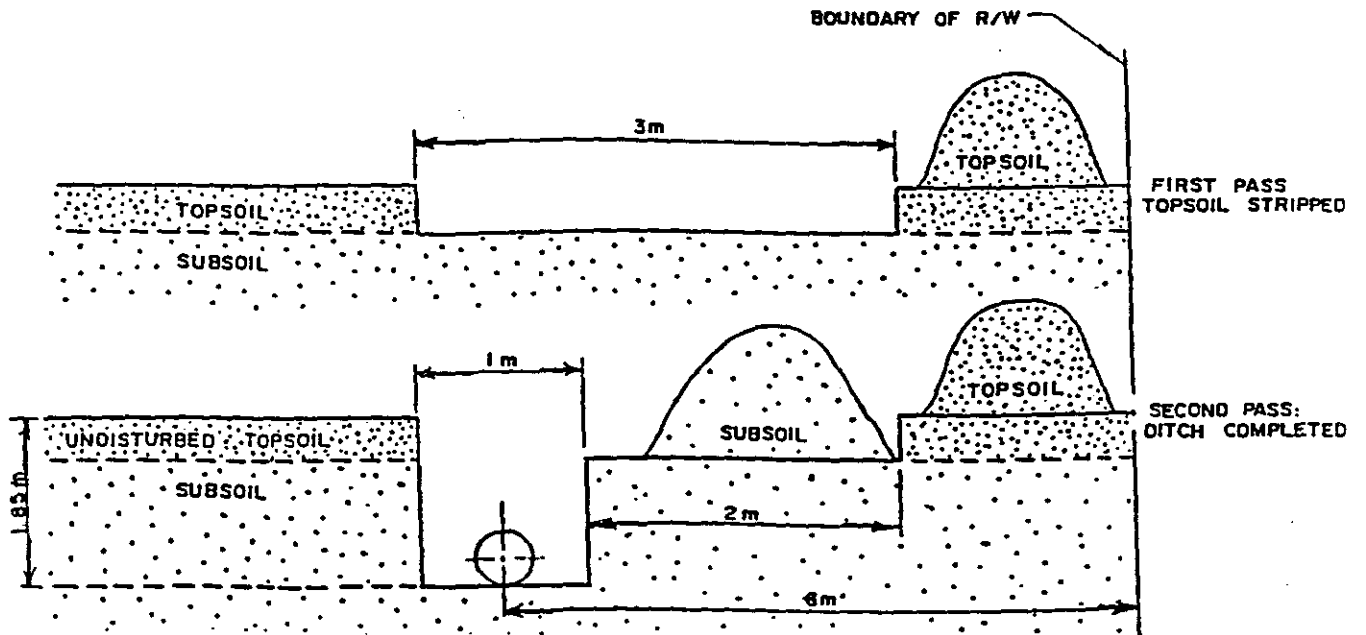
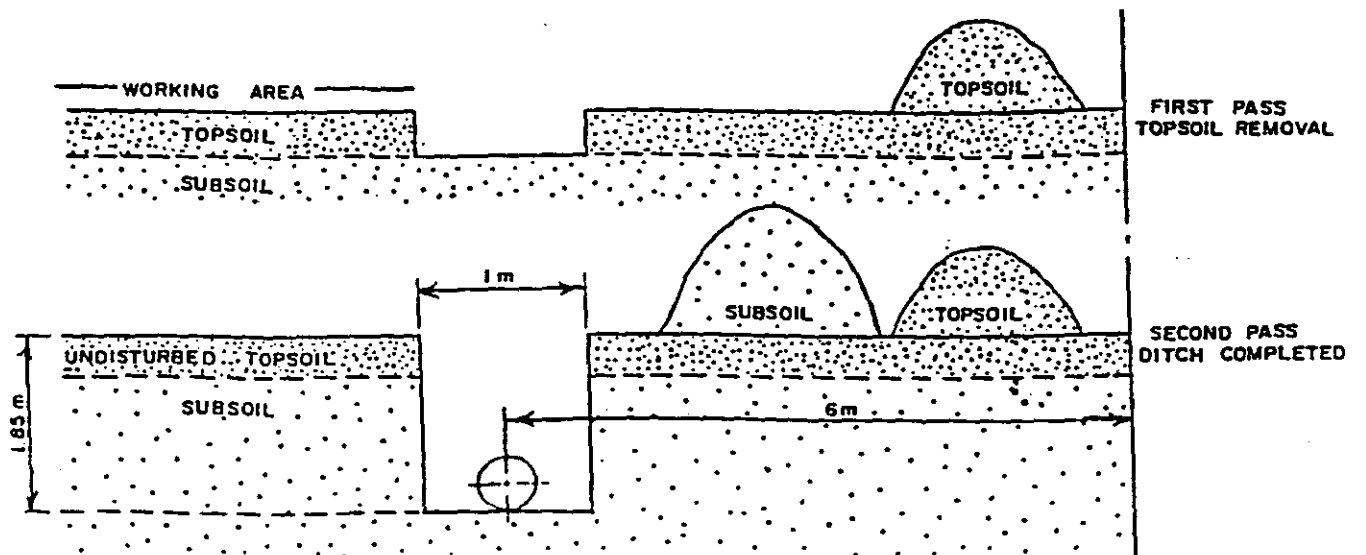


Figure 4.2-B

ALTERNATE



TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.5 - Grading

TP.5.1 Work Covered

This shall include all excavations except trenching, the construction of embankments, ditch or small stream diversions, irrigation channel and drainage area crossings, temporary bridge and road construction, or other work performed to facilitate the movement of equipment onto and along the right-of-way.

TP.5.2 Construction Procedure

The Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all Grading operations.

Compliance

TP.5.2.1 The CONTRACTOR shall obtain approval from the Township Engineer before performing any grading work on municipal drains and culverts.

Spoil Banks

TP.5.2.2.1 Excess excavated material shall be placed in piles that will allow it to be returned to its place of origin with minimum handling. Such material shall not be scattered along the right-of-way and shall not be placed in low areas traversed by the pipeline route without the consent of the ENGINEER.

TP.5.2.2.2 Separate spoil banks shall be created for subsoil and topsoil and the CONTRACTOR shall make every effort to prevent mixing.

Creeks/Ditches

TP.5.2.3.1 Material removed from creek banks shall be kept to a minimum, shall only be removed directly over the trench line and shall not be allowed to enter the creek bed or water course.

TP.5.2.3.2 The CONTRACTOR shall take necessary precautions to maintain the flow of water in all ditches and channels to the satisfaction of the Township Engineer, the LAND OWNER and/or TENANT.

Bends/Sags

TP.5.2.4 The CONTRACTOR shall grade off sharp points or hollows in order to allow the pipe to be bent and laid within the minimum radius of bends allowed by the contract documents. Any drilling, blasting, or excavation of rock encountered, shall be completed without further compensation.

TP.5.3 Basis of Payment

TP.5.3.1 The work described in this Section will be paid for as part of the Proposal. There will be no separate payment for Grading.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.6 - Unloading, Hauling, Stringing and Storing

TP.6.1 Work Covered

This work shall include unloading, storing, hauling, stringing, and the handling of all pipe, fittings and other associated materials. It excludes the unloading and storing carried out by the COMPANY prior to the execution of this contract with the CONTRACTOR. All scheduling of the material deliveries, once it is made available by the COMPANY, is the responsibility of the CONTRACTOR.

TP.6.2 Construction Procedure

Responsibilities

- TP.6.2.1.1 The COMPANY will arrange for the delivery of materials to the construction site.
- TP.6.2.1.2 The COMPANY will keep the CONTRACTOR informed as to the movements of materials and will endeavour to effect delivery in accordance with the schedule furnished for the convenience of the CONTRACTOR.
- TP.6.2.1.3 The CONTRACTOR shall be responsible for all costs for demurrage, storage, charges or claims of any nature whatsoever occasioned by the CONTRACTOR'S failure to unload the materials promptly upon their arrival at the destination, unless the Wet Soil Shutdown Policy is in effect.
- TP.6.2.1.4 The COMPANY may at its discretion, establish a central warehouses for the receipt and delivery of fittings, valves, and other miscellaneous small materials for the CONTRACTOR. The CONTRACTOR agrees to accept delivery and unload said materials at such points.
- TP.6.2.1.5 The CONTRACTOR will keep the COMPANY informed as to the locations of its unloading gangs so that the COMPANY can arrange for an inspector to be present where the CONTRACTOR is unloading material.

Receiving

- TP.6.2.2.1 All delivered material shall be checked for quantity and condition upon arrival by representatives of both the CONTRACTOR and the COMPANY. A written record itemizing the quantity and condition of the delivered material, signed by both representatives, shall become the document of binding arbitration between the COMPANY and the CONTRACTOR.
- TP.6.2.2.2 Prior to accepting damaged material, the CONTRACTOR shall prepare a damage report which shall be signed by the carrier's agent and a copy forwarded to the COMPANY.

TP.6.2.2.3 It is the CONTRACTOR'S responsibility to receive all pipe with undamaged bevel ends. If pipe received is damaged without a damage report signed by the carrier's agent, the CONTRACTOR shall rebevel all damaged ends at its own expense.

Pipe Handling

TP.6.2.3.1 Pipe shall be handled in a manner which prevents possible damage to pipe walls and pipe ends. Restraints shall always be used in cross-country or rough road hauling. Pipe shall be handled with suitable slings or end hooks and not dropped or rolled onto or off vehicles.

TP.6.2.3.2 Pre-coated pipe shall be carefully handled with adequate equipment designed to prevent damage to the coating: padded bolsters for hauling, wide non-abrasive canvas or leather belts for unloading and padded skids or sacks for stringing on the right-of-way.

TP.6.2.3.3 The CONTRACTOR shall be held responsible for any damage to the pipe and/or coating resulting from careless handling and such damage will be repaired immediately at the CONTRACTOR'S expense and to the satisfaction of the COMPANY.

TP.6.2.3.4 Any double handling of the pipe is at the CONTRACTOR'S expense.

TP.6.2.3.5 Stockpiled pipe shall be carefully stacked using skids and padding supplied by the CONTRACTOR and blocked to avoid damage to the pipe or pipe coating. Rolling of the pipe onto the skids shall not be permitted. Pipe shall in no instance be stacked higher than 3 rows.

Pipe Loading

TP.6.2.4.1 Pipe being loaded for transport shall have suitable tie downs, supports and blocking to prevent shifting. Tie-downs, supports and blocking shall be of such material and construction as to provide adequate protection to the pipe and the pipe coating.

TP.6.2.4.2 Pre-coated pipe may require tarpaulin protection when being hauled on gravel roads.

Valves/Fittings

TP.6.2.5 Valves, fittings and other material shall be unloaded in a manner to prevent their damage and shall be stored in a manner to preserve their condition and prevent loss. Valves, flanged fittings, or other material with finished surfaces shall always be placed on skids to prevent the finished surfaces from coming into contact with the ground.

Stringing

TP.6.2.6.1 The Tecumseh Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all Stringing operations.

- TP.6.2.6.2 Wherever possible, stringing trucks should drive over the future trench area to avoid possible undue compaction along the easement.
- TP.6.2.6.3 The CONTRACTOR shall take delivery of the pipe at the work right-of-way in areas to be determined by the COMPANY.
- TP.6.2.6.4 The CONTRACTOR shall string the pipe in such a manner as to avoid excess or deficient quantities of pipe on the route.
- TP.6.2.6.5 The CONTRACTOR shall string the pipe so it causes the least interference with the normal use of land crossed by the right-of-way. Gaps for the passage of farm stock or equipment shall be left as required.
- TP.6.2.6.6 The pipe may be continuously strung except at river, railroad or highway crossings. At these locations the pipe shall be stacked by the CONTRACTOR in a manner and at a location satisfactory to the COMPANY.

TP.6.3 Basis of Payment

- TP.6.3.1 Pipe unloading, hauling, stringing and/or storing shall be paid for as part of the Proposal. It will be paid upon the actual surveyed pipeline footage strung. No separate payment will be made for Unloading, Hauling, Stringing and Storing.
- TP.6.3.2 All costs for demurrage, storage and other claims from the carrier resulting from pipe which cannot be strung due to wet soil conditions, as dictated by the Wet Soil Shutdown Policy, shall be the responsibility of the COMPANY.
- TP.6.3.3 The CONTRACTOR will not be reimbursed for stand-by charges for delays effected by the carrier over which the COMPANY has no control.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.7 - Trenching

TP.7.1 Work Covered

This shall include all excavation work, whether by trenching machine, backhoe, power shovel, hand, blasting or other methods, which may be necessary to prepare a trench subject to the following specifications.

TP.7.2 Construction Procedure

The Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all Trenching operations.

Staking

TP.7.2.1 With reference to the right-of-way stakes, the CONTRACTOR shall offset all stakes showing station numbers in such a manner that they will remain in place for the duration of the job. Any re-staking made necessary by the CONTRACTOR'S failure to preserve the stakes shall be charged to the CONTRACTOR'S account.

Line Crossings

TP.7.2.2.1 The COMPANY will arrange for the location of all buried lines and structures which cross the easement but takes no responsibility for the correctness or completeness of such information.

TP.7.2.2.2 The CONTRACTOR shall be solely responsible for notifying all owners of pending construction activity in the vicinity of all pipeline and utility line rights-of way or structures. All trenching activity in these areas shall be governed by the requirements of the facility owner.

TP.7.2.2.3 Unless specific authorization is given by the facility owner, excavation around existing lines and structures shall not be done without the owner representative on site.

TP.7.2.2.4 The CONTRACTOR shall locate all pipelines, utility lines and underground structures by hand excavation. Mechanical excavation shall not be allowed within 0.3 metres of any structure, unless otherwise directed by the ENGINEER or the facility owner.

TP.7.2.2.5 The CONTRACTOR shall be responsible for the cost of repair and replacement of all damaged underground structures (except for drainage tile) to the satisfaction of the facility owners and for any losses which may result from such damage .

Adjacent Structures

TP.7.2.3 Where trenching takes place adjacent to an existing buried utility, pipeline or structure, the CONTRACTOR shall take every precaution to ensure that no contact is made with that facility. The same conditions as outlined in Specification TP.7.2.2 shall apply.

Trench Dimensions

TP.7.2.4 The trench shall be excavated to dimensions no less than those shown in the "Trench Dimensions" table below or, over-riding this, to the depth specified in the Job Description. The depth of the trench shall be measured from the original ground level on each side of the trench.

TRENCH DIMENSIONS

| <u>Size of Line</u> <u>(mm)</u> | <u>Cover</u> <u>(Metre)</u> | <u>Width</u> <u>(Metre)</u> |
|------------------------------------|--------------------------------|--------------------------------|
| 273 | 1.2 | .57 |
| 321 | 1.2 | .62 |
| 406 | 1.2 | .71 |
| 508 | 1.2 | .81 |
| 610 | 1.2 | .91 |

Spoil Banks

TP.7.2.5.1 Subsoil and topsoil must be adequately separated to ensure that soil mixing does not occur. All subsoil excavated during trenching shall be piled separately from the topsoil pile. Refer to Figure 4.2-A or 4.2.-B.

TP.7.2.5.2 Periodic gaps shall be left in both the topsoil and subsoil spoil banks to maintain surface drainage patterns.

Trench Bottom

TP.7.2.6 Wherever the bottom of the trench contains projecting rocks which might damage the pipe or coating, the trench bottom shall be padded with a minimum of 100 mm of backfill material to be furnished and installed by the CONTRACTOR at the COMPANY'S expense. The work must be approved by the COMPANY before commencement.

Watercourses

TP.7.2.7 See the Drain and Creek Crossings Specification TP.13.2.6 for trenching across watercourses.

Access

TP.7.2.8 The CONTRACTOR shall provide access across the trench, wherever necessary, to permit the LAND OWNER and/or TENANT to move livestock and equipment around the property. The CONTRACTOR shall patrol the area from time to time to insure that any affected livestock are able to cross the access.

Extra Depth Trench

TP.7.2.9.1 It shall be necessary to provide a trench of additional depth at certain locations. These include approaches to road crossings, existing and planned road allowances, existing and planned drainage ditches, creeks and approaches to creeks, drainage tile and all underground structures such as pipelines and utility lines. The above described additional depth trenching shall be known as "Normal Extra Depth Trenching", and no extra compensation will be paid.

TP.7.2.9.2 The CONTRACTOR shall prepare the trench so that the pipeline will cross under all underground structures with at least 0.3 metres (12 inches) of clearance or as otherwise specified on the construction drawings.

Drainage Tiles

TP.7.2.10.1 Where the pipeline trench intercepts drainage tile, the CONTRACTOR shall excavate the trench so that the pipeline can cross under the tile with a minimum clearance of 300 mm.

TP.7.2.10.2 The CONTRACTOR shall carefully and immediately mark the location of all damaged tile in a prominent manner by a secure stake with a yellow flag attached. These markers are not to be removed until the drainage tiles have been permanently repaired.

TP.7.2.10.3 Tile which is damaged or cut by the trench excavation shall be removed back from the edge of the trench a minimum of 0.5 meter distance. In order to prevent the entrance of debris into the drainage system and in preparation for repair, the open ends of the drainage tiles are to be temporarily plugged with a suitable material supplied by the COMPANY.

TP.7.2.10.4 Any drainage tile damaged, cut or removed shall be permanently repaired in accordance with the Drainage Tile Specification TP.18. The COMPANY will supply all repair materials.

TP.7.2.10.5 Where a major or main tile is cut, and when so directed by the Tile Drain Inspector or the COMPANY, a temporary repair using a carrier pipe or similar material shall be completed to maintain drainage of the LANDOWNER'S property during the construction period. The temporary repair should be completed just prior to backfilling and shall remain staked in accordance with TP.7.2.10.2 until the permanent repair has been completed.

Abnormal Extra Depth

TP.7.2.11 At certain locations, the COMPANY may require the CONTRACTOR to excavate the trench to depths greater than those covered by "Normal Extra Depth Trenching". This may include locations such as swamps, areas subjected to periodic flooding, areas where additional excavation is required to prevent freezing, agricultural land where clearance is to be provided for the

installation of tile or drainage ditches and any area where the right-of-way easement so requires. An extra depth trench such as this shall be known as an "Abnormal Extra Depth Trench" and no extra compensation will be made to the CONTRACTOR unless 30 metres (100 feet) or more of continuous "Abnormal Extra Depth Trench" is excavated.

Trench Contour

TP.7.2.12.1

The CONTRACTOR shall ensure that the bottom of the trench is as level as possible so that the amount of pipeline bending will be minimized. This can be accomplished by operating the trenching machine at appropriate depths to compensate for rolling terrain. Finish grading of the trench by hand should be minimized wherever practicable.

TP.7.2.12.2

When trenching approaches any road, railway crossing or small water course, the base of the trench shall be gradually sloped towards and away from the obstruction starting at a point approximately 30 metres from the obstruction.

Work Stoppage

TP.7.2.13

The CONTRACTOR shall immediately suspend trenching operations upon discovery of archaeological resources, skeletal remains, landfill disposal site or contaminated soil. Work shall not proceed in that area until approval has been received from the COMPANY.

Safety

TP.7.2.14.1

Excavation in all areas shall conform to the Construction Safety Act for construction projects - Ontario Regulations 659 to 679.

TP.7.2.14.2

The Contractor shall erect barricades and post warnings to prevent injury to the public from the open trench area.

TP.7.3 Basis for Payment

TP.7.3.1

The work described in this section will be paid for as part of the Proposal. No separate payment will be made for Trenching.

TP.7.3.2

Any "Abnormal Extra Depth Trench" will be paid for as outlined in the Proposal.

TP.7.3.3

Earth padding will be paid for as outlined in the Proposal.

TP.7.3.4

No payment will be made for over-excavation.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.12 - Highway, Roadway and Railway Crossings

TP.12.1 Work Covered

This shall include all work necessary to excavate, bore, haul, string and install pipe under roadways, railways and highways. It shall also include the repair of damages caused by such operations.

TP.12.2 Construction Procedure

General

TP.12.2.1.1 The Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all topsoil stripping and bore pit excavations.

TP.12.2.1.2 In preparation for boring the crossing, all clearing and handling of topsoil shall be carried out in accordance with the Clearing specification TP.2. The CONTRACTOR shall prevent mixing of topsoil and subsoil by following the easement stripping and soil piling procedures outlined in the Soil Handling Specifications TP.4. The Trenching and Backfilling Specifications, TP.7 and TP.15 respectively, shall be adhered to on all approaches to crossings.

Compliance

TP.12.2.2.1 The CONTRACTOR shall become familiar with all the requirements and restrictions of the crossing permits obtained by the COMPANY and shall conduct the work in strict accordance with such requirements and restrictions. This shall include 48 hours notification to the proper authorities having jurisdiction.

TP.12.2.2.2 Additional working easement is required to store excavated materials and will be secured by the COMPANY. In no instances shall the CONTRACTOR use any extra easement without the prior approval of the COMPANY. Compensation and/or damages arising from unauthorized usage of unsecured easements shall be borne by the CONTRACTOR.

TP.12.2.2.3 The CONTRACTOR shall not perform any excavations on roadway, railway or highway right-of-ways without approval by the COMPANY.

TP.12.2.2.4 The CONTRACTOR shall erect barricades and post warnings to prevent injury to pedestrians or vehicular traffic.

TP.12.2.2.5 The CONTRACTOR shall not open cut any roadway, railway or highway right-of-way crossings; all crossings shall be bored.

Procedure

- TP.12.2.3.1 Heavy wall pipe shall be used at all road crossings, thereby eliminating the need for permanent casing of the bore hole.
- TP.12.2.3.2 The SLICK BORE METHOD shall be used for all boring.
- TP.12.2.3.3 The top of the pipe shall be either 2.0 metres below the crown of the road or 1.2 metres below the lowest ditch bottom adjacent to the road, whichever is lower, or as indicated on the construction drawings. The pipe must remain at this elevation to a point 6 metres on either side of the road allowance, after which it can be brought up to normal cover of 1.2 metres below grade by means of a cold bend or gradual elevation change, provided that neither method causes the pipe to exceed its free stress point.

TP.12.3 Basis of Payment

The work described in this Section will be paid on a per unit basis as outlined in Bored Crossing portion of the Proposal.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.13 - Drain and Creek Crossings

TP.13.1 Work Covered

This shall include all labour, equipment and materials required for the construction of the pipeline across any creeks, watercourses or municipal drains. Bored or directionally drilled crossings are excluded from this specification.

TP.13.2 Construction Procedure

General

TP.13.2.1.1 The Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all drain or creek crossings.

TP.13.2.1.2 All clearing shall be done in accordance with the Clearing Specification TP.2. The CONTRACTOR shall prevent mixing of topsoil and subsoil by following the easement stripping and soil piling procedures outlined in the Soil Handling Specifications TP.4. The Grading, Trenching and Backfilling Specifications, TP.5, TP.7 and TP.15 respectively, shall be adhered to on all approaches to crossings.

Compliance

TP.13.2.2.1 All crossing permits and approvals will be obtained by the COMPANY and copies will be supplied to the CONTRACTOR. The CONTRACTOR shall become familiar with all the requirements and restrictions of the crossing permits and approvals and shall conduct the work in strict accordance with such requirements and restrictions.

TP.13.2.2.2 The COMPANY will secure extra working easement to accommodate soil storage and excavating equipment at the crossing locations. Compensation or damages arising from unauthorized usage of unsecured easement shall be the responsibility of the CONTRACTOR.

TP.13.2.2.3 The CONTRACTOR shall notify the COMPANY and all appropriate authorities at least 48 hours prior to each crossing's scheduled construction.

Typical Crossing

TP.13.2.3 Figure 13.2-A illustrates a typical creek or drain crossing. The actual crossing set-up and procedure used will depend upon conditions at the time of construction. The set-up and procedure used by the CONTRACTOR shall be approved by the COMPANY.

Fuelling

TP.13.2.4.1

Refuelling and maintenance of equipment must be set back from any body of water a minimum of 100 m to minimize the possibility of contaminating the water. To minimize the risk of fuel spills, the CONTRACTOR should ensure that all containers, hoses and nozzles are free of leaks, all fuel nozzles are equipped with automatic shut-offs and operators are trained and stationed at both ends of the hose during fuelling (unless the ends are visible and readily accessible by one operator). All fuel remaining in the hose must be returned to the storage facility.

TP.13.2.4.2

All fuel and service vehicles shall carry a minimum of 25 kg of suitable commercial absorbent material, 30 m² of 6 mil polyethylene, a shovel and one fuel barrel (lid removed).

TP.13.2.4.3

The CONTRACTOR shall have a mitigation plan in place in the event of a spill and workers shall be trained in the clean-up procedures and the reporting requirements.

TP.13.2.4.4

The CONTRACTOR shall immediately report ALL spills to the COMPANY, regardless of how minor they are.

Vegetation

TP.13.2.5.1

Wherever possible, vegetation should be removed only directly over the trench line.

TP.13.2.5.2

Ground vegetation shall not be removed from the slope approaching the watercourse crossing until the day prior to the crossing and shall be kept to the minimum required for pipe installation.

Wet Crossing

TP.13.2.6

If conditions permit, and where approval has been obtained from the COMPANY, the Ministry of the Environment, the Ministry of Natural Resources and the local Conservation Authority, "Wet Crossings" (in-the-stream) may be undertaken. At these locations sandbags may be required upstream and some siltation control such as straw bales may be required downstream.

Trenching

TP.13.2.7.1

Trenching activity at watercourses shall immediately precede the pipelaying operation. Excavation of a pipeline trench across a watercourse shall be scheduled for rapid completion to reduce downstream siltation.

TP.13.2.7.2

Appropriate trench excavation methods shall be employed to minimize entry of materials from the trench into the watercourse, giving due consideration to the weather and stream conditions at the time of construction.

TP.13.2.7.3 A plug of undisturbed soil shall be left in the trench-line in order to minimize soil from the trench flowing into the watercourse. The recommended minimum width of unexcavated stream bank is 3 meters. The cutting of this plug shall be delayed until the actual laying of the pipeline is to take place.

TP.13.2.7.4 Dikes may be required as directed by the ENGINEER. Dikes should be constructed with snow-fencing, straw bales and filter cloth, or silt fence and straw bales or sandbags. Spoil from the river bed shall be stockpiled behind dikes to prevent sediment from entering the watercourse.

Trench Dimensions

TP.13.2.8.1 Unless otherwise specified by the COMPANY, the trench for the pipeline shall be excavated to a width of at least that indicated on Trench Dimensions Table in Specification TP.7.2.4. It shall be wide enough to accommodate river weights and sufficiently deep to provide the minimum cover of 1.5 metres below the solid stream bed bottom.

TP.13.2.8.2 Unless shown on the construction drawings, the grade shall limit sag bends to a distance of not less than 3.5 metres measured landward from the point of normal water elevation.

River Weights

TP.13.2.9 The section of pipe to be laid across streams, flood plains or lowlands shall be weighted with river weights and/or concrete anchors to be positioned as directed by the COMPANY. To minimize the duration of in-stream activity, weights should be placed on site prior to construction at all watercourse crossing. Refer to the River Weights Specification TP.23.

Backfill

TP.13.2.10.1 To minimize erosion of the stream bed, clean, granular material shall be used as backfill. The use of unwashed gravel, spoil or mud slurry for backfill shall not be allowed in the stream bed.

TP.13.2.10.2 Any unsuitable materials for backfill shall be hauled and disposed of at an off-site location, as directed by the ENGINEER and approved of by the COMPANY. All hauling and disposal costs shall be borne by the CONTRACTOR.

TP.13.2.10.3 The watercourse banks shall be backfilled from the river upwards. Backfill shall not be pushed down the slope. This procedure will prevent silt laden trench water from entering the watercourse during backfilling. As much water as possible should be removed from the trench prior to backfilling.

TP.13.2.10.4 Where required by the COMPANY, a concrete slab shall be placed between the pipeline and the bottom of a municipal ditch. Refer to the Concrete Specification TP.22.

Erosion/Sediment Control

- TP.13.2.11.1 Sackbreakers, riprap or berms shall be placed at locations designated by the COMPANY to minimize potential erosion.
- TP.13.2.11.2 All in-stream siltation controls should be installed prior to construction and maintained throughout the watercourse crossing.
- TP.13.2.11.3 If in-stream setting basins are deemed necessary by the COMPANY, the CONTRACTOR shall maintain and clean the silt, sand and debris as required to minimize construction siltation.
- TP.13.2.11.4 Silt laden water from the trench should be de-silted by allowing the water to settle in a sump. Sumps should be constructed with silt fences or straw bale filters to contain excavated, in-stream spoil so that silty run-off does not enter the watercourse. Trench water must never be pumped directly into a watercourse.

Weirs/Flumes

- TP.13.2.12.1 The COMPANY may direct the CONTRACTOR to install temporary weirs or cofferdams and flumes to control siltation or to stabilize the trench excavation. The flumes shall be designed to maintain normal stream flow so as not to interfere with downstream aquatic life or water users. At no time should the passage of migratory fish be blocked.
- TP.13.2.12.2 The material used to cover the flumes shall only be clean, granular material. Excess spoil from the stream bed trench or other locations on the right-of-way shall not be used.

Access Roads

- TP.13.2.13.1 Where a temporary access road is required across a watercourse, the CONTRACTOR shall construct a temporary bridge with a culvert. The culvert shall be covered with clean, granular material and shored up with sand bags at either end. The culvert size shall be adequate to maintain stream flow and to minimize water ponding. Refer to Figure 13.2-A.
- TP.13.2.13.2 Vehicular traffic across the temporary roadway should be minimized during the work.

Restoration

- TP.13.2.14.1 Restoration of the stream channel shall include removal of all temporary structures, reshaping the stream to its original configuration and gradient and the removal of all construction material and debris.
- TP.13.2.14.2 Siltation control devices shall remain in place until stream banks are stabilized and the COMPANY has authorized their removal.

TP.13.2.14.3 At the conclusion of construction, the banks of the watercourse shall be restored to their original grade and stabilized with rock or other heavy "non-erodible" material at the water line. Where required by the COMPANY, the upper bank shall be seeded and then covered with erosion control matting.

TP.13.3 Basis of Payment

TP.13.3.1 The work in this section will be paid for as part of the items entitled Bid Form Schedule B II (Drain Crossings).

TP.13.3.2 In-Stream crossings shall be paid for as normal trenching (plugs or sack breakers left as required) with any extras paid for as specified in the Bid Proposal.

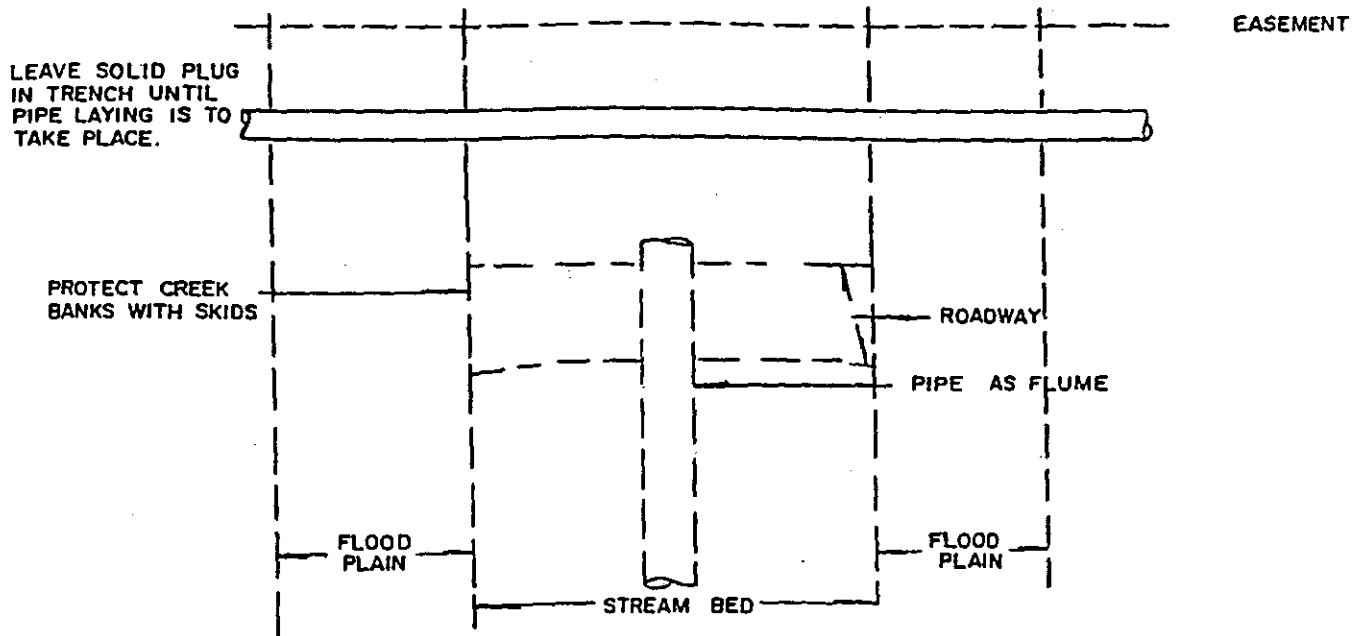


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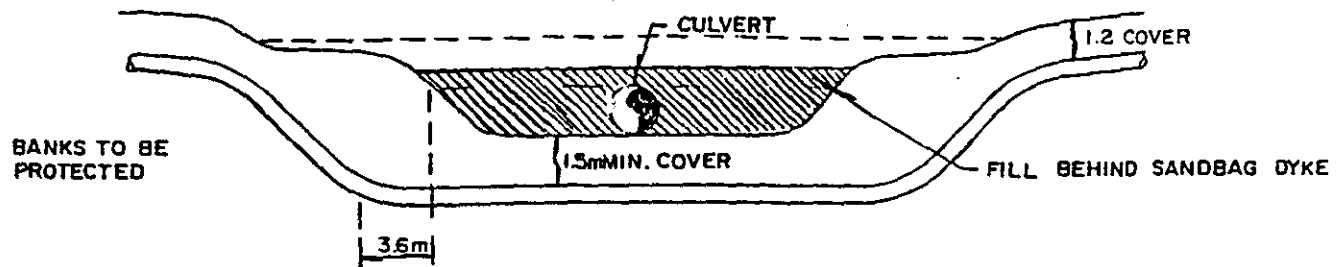
Pipeline Construction Specification 93-TP.13

Figure 13.2-A

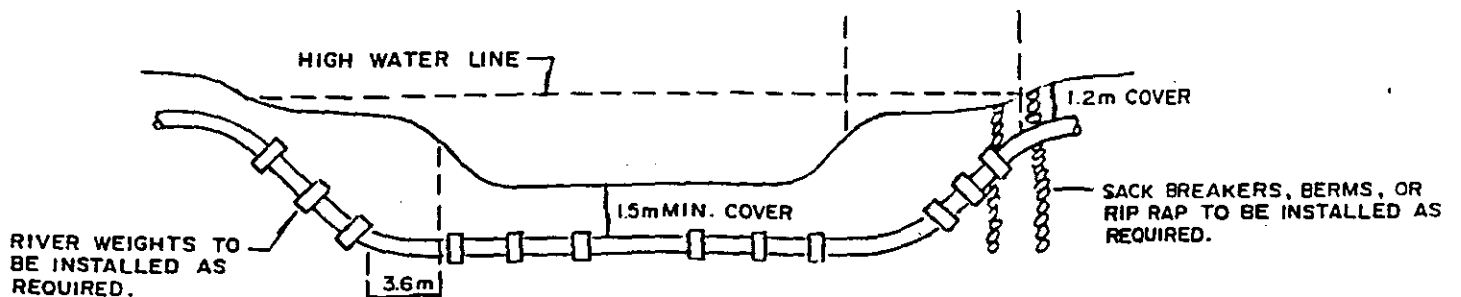


PLAN VIEW

TYPICAL DRAIN CROSSING DETAIL



CROSS SECTION DURING CONSTRUCTION



CROSS SECTION SHOWING CONSTRUCTION COMPLETE

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.15 - Backfill

TP.15.1 Work Covered

This shall include all work necessary to backfill the trench, crown the trench-line and to restore agricultural lands, creek banks, hillsides or other places where the easement has been disturbed.

TP.15.2 Construction Procedure

The Wet Soil Shutdown Policy as outlined in the Soil Handling Specification TP.4.2.5 shall apply during all Backfilling operations.

General

TP.15.2.1.1 The CONTRACTOR shall ensure that the completed backfill is never further than one kilometre from the lowering-in operation.

TP.15.2.1.2 All material used for backfill shall be of acceptable quality; it shall be free from large or frozen lumps, wood or other extraneous materials. Stones, rocks or boulders greater than 250 mm in diameter shall be removed prior to backfilling.

Backfilling

TP.15.2.2.1 Immediately after the pipe has been lowered into the trench it shall be weighted down by placing backfill material over it.

TP.15.2.2.2 After filling the trench to the level of the surrounding ground, the CONTRACTOR shall run over the backfill with one tread of a heavy tractor to compact the backfill. This tamping operation shall not be done in rocky terrain where the coating might be damaged.

TP.15.2.2.3 Once the above tamping operation is complete, the trench shall be crowned with additional subsoil to allow for future subsidence. The trench shall be left with a 200mm subsoil crown unless otherwise specified by the ENGINEER.

TP.15.2.2.4 After adequate provision has been made for normal trench subsidence, The CONTRACTOR shall remove any remaining subsoil as specified in TP.15.2.7.1.

Soil Replacement

TP.15.2.3.1 The Soil Handling Specification TP.4.2.4 shall apply for all replacing and restoration of top soil in agricultural areas.

TP.15.2.3.2 Once all drainage tile repairs, chisel ploughing and/or subsoiling is complete, the piled topsoil shall be evenly spread over the area previously stripped and crowned over the trench. The CONTRACTOR shall make every reasonable effort and utilize the necessary equipment and techniques to eliminate mixing of topsoil and subsoil and to minimize the compaction of both.

Drainage Tiles

TP.15.2.4.1 The CONTRACTOR shall exercise extreme caution when tamping or subsoiling in the vicinity of drainage tiles. Any damage caused to drainage tiles by the CONTRACTOR shall be the responsibility of the CONTRACTOR.

TP.15.2.4.2 Prior to chisel ploughing the easement and the replacement of top soil, all drainage tiles damaged during the trenching operation shall be excavated and repaired as outlined in the Drainage Tiles Specification TP.18.

Terrain Restoration

TP.15.2.5.1 All roads, pavements, hillsides, creek banks, terraces and other places where the CONTRACTOR has removed earth to facilitate the movement or operation of equipment shall be restored by the CONTRACTOR to their original profile and condition.

TP.15.2.5.2 All drainage ditches shall be left unobstructed by any backfill material to prevent flooding or water course diversions.

Clean-up

TP.15.2.6.1 All surplus rock and spoil removed from the trench shall be hauled off-site and disposed of at a location satisfactory to the COMPANY. All hauling and disposal costs incurred shall be borne by the CONTRACTOR.

TP.15.2.6.2 The disposal of welding rods, cans, trash, lumber and other foreign substances of any kind into the pipeline trench during the backfill operation shall not be permitted.

TP.15.3 Basis of Payment

The work described in this Section will be paid for as part of the Proposal.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.16 - Hydrostatic Test, Leak Test and Pigging

TP.16.1 Work Covered

This work shall include the pigging, filling, leak and strength testing of the pipe prior the final tie-ins as defined in the Scope of Work.

TP.16.2 - General

Compliance

- TP.16.2.1.1 All hydrostatic pressure testing of the pipeline and attachments shall be in accordance with CAN/CSA Z184-M92 Section 8.
- TP.16.2.1.2 All hydrostatic pressure testing procedures, including filling, draining and cleaning, shall be conducted in accordance with the applicable legislation and permits.
- TP.16.2.1.3 The schedule for hydrostatic testing shall be prepared by the CONTRACTOR and approved by the COMPANY.

Responsibilities

- TP.16.2.2.1 The CONTRACTOR shall conduct all work related to hydrostatic testing of the pipeline and appurtenances and shall supply all materials and labour, except as noted.
- TP.16.2.2.2 The CONTRACTOR shall employ a qualified Test Supervisor or Foreman for ensuring that instrumentation, line filling, leak testing, pressure testing, data recording and documentation for all tests is carried out in accordance with the COMPANY'S specifications. The proposed Test Supervisor shall be named in BID FORM and shall be subject to the COMPANY'S approval prior to the start of construction.
- TP.16.2.2.3 The COMPANY shall appoint a TESTING ENGINEER who shall witness all testing and have the right to stop a test, extend a test period or ask for a re-test as conditions warrant. The CONTRACTOR shall comply with any and all instructions given by the TESTING ENGINEER.

Test Sections

- TP.16.2.3 The ENGINEER may divide the pipeline into several sections for the purpose of conducting hydrostatic strength and leak testing. These sections will be tested as soon as possible following construction of each section.

Test Header
TP.16.2.4.1

The CONTRACTOR shall fabricate and install test headers and valves for the testing of each section as specified by the ENGINEER. Sufficient number of test headers shall be fabricated to maintain the construction schedule.

TP.16.2.4.2

The CONTRACTOR shall supply all materials for test headers except heavy-wall pipe which shall be supplied by the COMPANY. The CONTRACTOR shall supply any additional materials and fittings required during testing for replacement of lost or defective materials in order to maintain the construction schedule.

TP.16.2.4.3

The CONTRACTOR shall submit a drawing of the proposed test header for the COMPANY'S approval prior to fabricating the test headers and at least 15 days prior to the commencement of testing.

Cleaning
TP.16.2.5

The pipeline shall be cleaned as required by running air propelled cleaning pigs (Williamson WCK-3, WCK-12 or an approved equivalent) to remove mill scale and rust. All pigs necessary for the cleaning operation shall be furnished by the CONTRACTOR.

Filling
TP.16.2.6.1

The CONTRACTOR shall acquire all permits for taking, using and disposal of water for testing and cleaning purposes. A copy of all permits shall be provided to the COMPANY.

TP.16.2.6.2

The COMPANY or the Ministry of Environment may require a chemical analysis of the test water. In this instance, the CONTRACTOR shall assist the COMPANY in obtaining water samples as necessary at no additional cost to the COMPANY. The water analysis lab work will be at the expense of the COMPANY.

TP.16.2.6.3

The CONTRACTOR shall supply and transport all test water to the test site. This shall also include any chemicals deemed necessary by the COMPANY to prevent biological growth and/or corrosion, the injection equipment and any labour to measure the injection of such chemicals into the pipeline.

TP.16.2.6.4

The fill water shall be filtered prior to use in the pipeline, if required by the COMPANY. The filter shall be equivalent to a 100 mesh screen and be capable of removing 99 percent of all particles 92 microns in diameter or larger. The filters shall be of the back flushing or cartridge type and have a means of cleaning without being disconnected from the piping. If the

cartridge type is used a sufficient quantity of cartridges shall be on hand at the filter location.

TP.16.2.6.5 If water is transferred from one section to another, the COMPANY may require filtering between the sections.

TP.16.2.6.6 The recommended pumping rate is 4550 litres per minute against 700 kPa. The CONTRACTOR shall provide notice to the COMPANY of their proposed pumping rate and equipment for approval by the COMPANY prior to testing.

TP.16.2.6.7 The downstream end of the test section shall initially be shut-in and the test section shall be continuously filled with water behind a displacement pig(s). A suitable back pressure shall be maintained downstream of the displacement pig(s) to ensure that the pig does not run ahead of the fill water when going downhill.

Winter Testing

TP.16.2.7.1 Winter conditions are defined as those which, in the opinion of the COMPANY, may cause freezing of the fill water in the test section due to low ambient or ground temperatures. The CONTRACTOR shall take adequate precautions to prevent freezing within all piping, including the protection of test manifolds and valve settings.

TP.16.2.7.2 Under winter testing conditions, the test water shall be mixed with high temperature water of approximately +10 degrees centigrade, then pumped into the test section until the temperature of the discharge water is a minimum of +2 degrees centigrade.

TP.16.2.7.3 Upon approval of the COMPANY and all regulatory authorities having jurisdiction, the CONTRACTOR may utilize a suitable water/methanol testing medium as an alternate to using heated water.

TP.16.2.7.4 The CONTRACTOR shall, without additional cost to the COMPANY, utilize winter testing techniques and supply all special materials to ensure that freezing does not occur during filling, testing, de-watering or drying in any pipe, valves or fittings.

Temperature

TP.16.2.8.1 The temperature of the fill water and, if heating is required, the temperature of the discharge water shall be measured during filling. Temperature probes and continuous recorders shall be temporarily installed at either end of the test section and on significant lengths of exposed pipe to measure the temperature of the water within the pipeline. Temperature probes and recorders shall also be available to measure the ground

temperature at pipe depth at the same general locations as the water temperature probes.

- TP.16.2.8.2 The CONTRACTOR shall excavate a bell hole at each end of the test section for attachment of a temperature probe to the pipeline. This bell hole shall be a minimum of 30 meters from the nearest section of exposed pipe. The probes shall be attached to the pipe with thermal conducting putty and tape. The bell hole shall be completely backfilled prior to testing.

Fill Records

- TP.16.2.9.1 Records of the fill pressure in each test section shall be obtained on a 0 to 3,450 kPa recorder. These records shall be turned over to the COMPANY within 24 hours of the completion of the pressure test.

- TP.16.2.9.2 A meter of sufficient size and accuracy or tank gauges shall be used to measure the quantity of fill water pumped into the pipeline during any period.

Notice of Commencement

- TP.16.2.10.1 The CONTRACTOR shall provide 7 days advance notice to the COMPANY of the proposed test in order that the COMPANY may give proper notification to the Ontario Energy Board and/or Ministry of Environment.
- TP.16.2.10.2 The CONTRACTOR shall notify all Highway, Railroad, Municipal, Provincial, Telephone, Power or other authorities having jurisdiction in the test area a minimum of forty-eight (48) hours prior to testing any section.
- TP.16.2.10.3 The CONTRACTOR shall erect warning signs where there is exposed pipe or an appurtenance in close proximity to a public crossing. All persons not directly connected with the test or other COMPANY operations shall be kept off the pipeline right-of-way.

General

- TP.16.2.11.1 After the filling operation has been completed, blind flanges and bull plugs shall be installed on all connections that are not being utilized for the pressure recorder, deadweight gauge or pressure pump connections.
- TP.16.2.11.2 Filling or drain lines shall not remain attached to the pipeline during the temperature stabilization or test periods.
- TP.16.2.11.3 A pressure pump having a minimum output of 3.8 L/S at 20,700 kPa discharge pressure shall be used for all pressure testing.

Leak Test

- TP.16.2.12.1 The test section shall be pressurized to a minimum of 125% of the intended maximum operating pressure and held for twenty-four (24) hours to ensure that no leaks exist.
- TP.16.2.12.2 When the recommended test pressure is reached the pump shall be stopped, the pressure locked in and the temperature and pressure allowed to stabilize. If the pressure after stabilization is less than the recommended test pressure, the pumps shall be re-started and the pressures adjusted to the specified test pressure.
- TP.16.2.12.3 The TESTING ENGINEER shall select the length of the temperature stabilization period and shall terminate the test when twenty-four (24) hours has elapsed without pressure fluctuations that can be correlated to temperature variations.
- TP.16.2.12.4 The test will commence when the test pressure is reached and once the pressure chart is checked against the deadweight tester.
- TP.16.2.12.5 Deadweight readings shall be taken on a half-hourly basis thereafter for the duration of the test. If any rapid changes in the test pressure occur, pressure readings shall be recorded every 5 minutes to establish if the variations are linear.
- TP.16.2.12.6 Temperature recorders shall be checked at least every three (3) hours to avoid potential long periods of recorder malfunction.
- TP.16.2.12.7 The test will be conducted in such a manner as to prevent the test pressure from varying more than 2-1/2% due to ambient temperatures. Should this occur, return to the original test pressure shall be effected by the introduction or relief of the testing fluid. The volume of any testing fluid so added or relieved shall be measured and recorded.
- TP.16.2.12.8 Any re-pressuring of the pipe during the test may require a further period of stabilization. The new temperature stabilization period shall be determined using a temp-time plot with the stabilization time being sufficient when the temperature is equal to the ground temperature. The test period shall be extended as necessary to provide a twenty-four (24) hour hold period without an uncorrelated pressure loss from the designated test pressure.

Leaks

- TP.16.2.13.1 During the hold period, should a significant drop in pressure occur which cannot be attributed to changes in temperature, the CONTRACTOR shall locate and repair the leaks. Refer to Specification TP.16.2.15.
- TP.16.2.13.2 If the failure occurs during the twenty-four (24) hour hold period, a re-test for another twenty-four (24) hour period is required, once the repair is complete.
- TP.16.2.13.3 The recording instruments used for the continuous monitoring of pipeline pressure and temperature during the test are strictly for information gathering purposes and shall not be used for determining pressure drops due to pipeline leakage.

Strength Test

- TP.16.2.14.1 Where specified by the COMPANY, a four (4) hour strength test shall be conducted by the CONTRACTOR to monitor yielding and to confirm pipe integrity. In this instance, the TESTING ENGINEER shall produce a Yield Plot which plots pressure versus injected water volume. The CONTRACTOR shall assist the TESTING ENGINEER in obtaining proper data and shall ensure that a constant pumping rate is maintained during the creation of the Yield Plot. The CONTRACTOR shall ensure that sufficient water is available to complete a four hour test.
- TP.16.2.14.2 The cumulative and the incremental water volumes shall be recorded at 250 kPa intervals once the pressure has produced a hoop stress not less than 80% of the specified minimum yield strength of the pipe. The water volume shall be measured using a calibrated flow meter, tank gauge or stroke counter supplied by the CONTRACTOR.
- TP.16.2.14.3 The pressure shall be measured from the lowest point of elevation.
- TP.16.2.14.4 The TESTING ENGINEER will specify when the pipeline has reached its elastic limit and will advise the CONTRACTOR when to stop pumping. The TESTING ENGINEER shall declare the final test pressure but will not exceed 95% of the specified minimum yield of the pipe.

Failures/Repairs

- TP.16.2.15.1 In the event of a failure during testing, the CONTRACTOR shall complete a pipeline failure report under the supervision of the COMPANY.
- TP.16.2.15.2 If the failure is in the seam of the pipe, the entire joint in which the seam failure occurred shall be removed from the pipeline. At all other failure points,

the CONTRACTOR shall remove a minimum length of pipe equivalent to three pipe diameters from each side of the failure. The piece(s) removed shall be marked for the orientation of the failure in the trench and the approximate location of failure in the pipeline (kilometres from the end point).

TP.16.2.15.3 The CONTRACTOR shall not cut or damage the failed edge of the pipe during removal from the pipeline, during transit or upon unloading at the storage location. If the failed portion is too long for transport or handling, it may be cut at right angles to the failed edge. All portions are to be retained.

TP.16.2.15.4 The CONTRACTOR shall bear all costs of repair and replacement of damaged materials resulting from test failure attributable to negligence of the CONTRACTOR, inferior workmanship by the CONTRACTOR or defective or inadequate materials or equipment furnished by the CONTRACTOR.

TP.16.2.15.5 The COMPANY shall bear all costs for repairs and replacement of damaged materials resulting from test failures attributable to defective material furnished by the COMPANY. In such cases, the CONTRACTOR shall furnish all labour and equipment required at the applicable rates given in the BID FORM. If applicable, compensation paid to the CONTRACTOR for temporary delays shall be computed at the Stand-By rates specified in the BID FORM.

TP.16.2.15.6 The CONTRACTOR must retain sufficient manpower and equipment on site to repair all possible leaks in a manner satisfactory to the COMPANY. The CONTRACTOR shall therefore specify, as required in the BID FORM, the available manpower and equipment that will be dedicated to this repair task.

Test Documentation

TP.16.2.16.1 Test documentation shall consist of a pressure chart from a continuous recorder having a range at least 5 percent in excess of the test pressure; a minimum of two temperature charts from continuous recorders; a record of deadweight readings for the twenty-four (24) hour test period; a copy of the pressure-volume plot and associated readings, when required; a record of hourly ambient temperature readings; a log of testing activities.

TP.16.2.16.2 All data and charts shall be clearly marked with the start date and time, the completion date and time, a description of the test section and the location of the recorders. All material shall be signed by the

CONTRACTOR and the COMPANY. A smeared or illegible pressure chart shall be cause for a repeat of the test.

TP.16.2.16.3 Test forms will be supplied by the COMPANY. Test records shall be completed in accordance with the COMPANY'S instructions and submitted to the COMPANY when complete. Sample forms may be included as an agenda to this document.

Test Acceptance

TP.16.2.17.1 Under no circumstances shall any test be carried out unless approved by the COMPANY.

TP.16.2.17.2 The COMPANY shall have the authority to accept or reject a pressure test or request a time extension.

TP.16.2.17.3 The TESTING ENGINEER shall witness all tests and shall sign all charts and documents in accordance with the requirements of government agencies having jurisdiction.

Dewatering

TP.16.2.18.1 The CONTRACTOR shall be responsible for the disposal of test water in accordance with the water permits at times and locations satisfactory to the COMPANY.

TP.16.2.18.2 After completion of hydrostatic strength and leak testing, the pipe may be depressurized into the next test section.

TP.16.2.18.3 The depressurized water shall be removed using a displacement pig, or an approved equivalent, propelled with compressed air. The CONTRACTOR shall furnish all pigs necessary for the drying operation(s).

TP.16.2.18.4 After displacing the test water, additional displacement pigs propelled by warm, dry, compressed air shall be run through the section until no more free water is expelled from the line.

TP.16.2.18.5 Water shall be removed from all valves equipped with body drain connections.

TP.16.2.18.6 Water discharged from the pipeline onto the ground or directly into a water course, may require filtering at the discretion of the COMPANY. The CONTRACTOR shall filter the water with a 100 mesh screen, or equivalent. If an appreciable concentration of particles or discolouration is evident in the filter, the CONTRACTOR shall temporarily impound the test water behind straw bales to provide additional filtering.

TP.16.2.18.7 The water should be returned to the water course from which it was withdrawn. The quality of the water should be substantially the same as the quality withdrawn. The CONTRACTOR shall ensure that the discharge of test water into rivers or streams, directly or otherwise, shall meet all the requirements of regulatory bodies having jurisdiction.

TP.16.2.18.8 Care shall be taken while disposing of test water to prevent damage to crops, excessive soil erosion or the contamination of streams, rivers or lakes. The CONTRACTOR shall be responsible for all damages or claims arising from dewatering.

Fabricated Assemblies

TP.16.2.19 Fabricated assemblies which are to be permanently tied into an existing pipeline and which cannot be tested with the new pipeline shall be pre-tested by the CONTRACTOR prior to the tie-in. The test pressure shall be that which is specified for the particular section and be held for an 8-hour period or as otherwise specified by the ENGINEER.

Replacement Pipe

TP.16.2.20 The CONTRACTOR shall test 10 metres of replacement pipe for every 1 kilometre of installed pipe. This replacement pipe shall be tested in conjunction with the testing of a pipeline section, in quantities and at locations specified by the COMPANY. Lengths of pipe tested in this manner shall be cut from the test section after the test. The ends shall be re-bevelled, the pipe lengths labelled and then stockpiled at designated locations as instructed by the COMPANY at no additional cost to the COMPANY.

Test Instruments

TP.16.2.21.1 The test instruments listed below shall be furnished by the CONTRACTOR.

TP.16.2.21.2 Quantities shown are the minimum for one test crew per spread. If multiple crews are required to avoid delays each test crew shall be equipped with the instruments listed below.

TP.16.2.22.3 All instruments shall be certified for accuracy and approved by the COMPANY. Calibration certificates shall be on the job site and available for inspection at all times by the COMPANY and/or by representatives of government agencies having jurisdiction in matters of testing.

TP.16.2.22.4

| <u>ITEM</u> | <u>QUANTITY</u> | <u>DESCRIPTION</u> |
|-------------|-----------------|---|
| 1 | 1 | Portable Dead Weight Gauge: high pressure range 340 - 17,300 kPa in 7 kPa increments; Chandler Engineering No.2 - 1 with No.9-20 AC- ME tripod or equivalent. |
| 2 | 2 | Portable Recording Thermometer: range -30 to +50 degrees centigrade; 300 mm diameter chart; fully compensated for ambient temperature variations; Class 1 filled system; mechanical chart drive with 24 hour rotation, capillary inking system; 4.57 metres of stainless steel, armoured capillary tube. Bristol Model 1G501-d4-Z38A or equivalent with charts as required. |
| 3 | 1 | Portable Recording Pressure Gauge: range 0-21,000 kPa; stainless steel pressure element; mechanical chart drive with 24 hour rotation, capillary inking system; 4.57 metres of bronze, armoured, flexible metal connection hose with 6 mm NPT fitting on both ends. Bristol Model 1G501-d4-Z38A or equivalent with charts as required. |
| 4 | 2 | Yellow-Black Thermometer: range 0 to 50 degrees centigrade in 1/4 degrees centigrade increments; 300 mm long with string hole at top. Refinery Supply No. R203 or equivalent. |
| 5 | 1 | Pressure Gauge: range 0-21,000 kPa; 114 mm dial; 12 mm NPT fitting on lower connection. Ashcroft Duragauge 1379D. |

TP.16.3 - Basis of Payment

- TP.16.3.1 The CONTRACTOR'S costs for the work performed in this Specification shall be included in the Unit Lay Price specified in the BID FORM.
- TP.16.3.2 The disposal of test fluids as outlined in the Dewatering Specifications, TP.16.2.18, shall be included in the Unit Lay Price as specified in the BID FORM.
- TP.16.3.3 The CONTRACTOR shall perform all hauling, stinging, welding, cutting, bevelling, labelling and stockpiling of repair sections or replacement pipe at no additional cost to the COMPANY, unless otherwise specified in TP.16.2.15.5.
- TP.16.3.4 Water analyses requested by Ministry of Environment or the COMPANY shall be at the expense of the COMPANY.

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.17 - Clean-up and Restoration

TP.17.1 Work Covered

This shall include all work necessary to remove surplus material from the easement and any restorative measures required to repair damage resulting from the WORK.

TP.17.2 Construction Procedure

Compliance

TP.17.2.1.1 The Contractor is responsible for all damages which occur off the easement as a result of the construction activities and shall be responsible for restoring the construction area to as close to original condition as possible.

TP.17.2.1.2 Upon completion of clean-up operations, the CONTRACTOR shall promptly settle all off right-of-way damage claims with the LAND OWNER. Representatives of both the CONTRACTOR and the COMPANY shall be present during the settlement of ALL claims and for the signing of releases by the LAND OWNER and/or TENANT on approved forms.

TP.17.2.1.3 All post construction repairs shall be carried out by the CONTRACTOR to the full satisfaction of the LAND OWNER, the COMPANY, regulatory authorities having jurisdiction, municipal authorities and other facility owners.

General

TP.17.2.2.1 The Contractor shall conduct the clean-up operation as close as possible to the backfilling operation.

TP.17.2.2.2 Before the WORK is finally accepted by the COMPANY, the CONTRACTOR shall remove all surplus blasted or excavated material from the right-of-way and adjacent property, any public and private roads and all stream channels and ditches.

TP.17.2.2.3 All material shall be disposed of in a location approved by the COMPANY.

TP.17.2.2.4 All material used to perform the clean-up operation shall be furnished by the CONTRACTOR and is subject to final approval by the COMPANY.

Debris

- TP.17.2.3.1 All underbrush, broken skids and other such debris shall be disposed of as specified by the ENGINEER.
- TP.17.2.3.2 Oil drums, sheet metal from paint barrels and other objects shall be gathered up and removed from the easement.
- TP.17.2.3.3 In areas of the easement where rock excavation has occurred, all loose rock on the easement and adjacent property shall be picked up and disposed of.

Unused Materials

- TP.17.2.4 All unused materials originally furnished by the COMPANY shall be picked up at the time of clean-up, regardless of their location, and delivered to the COMPANY'S storage site or warehouse as directed by the ENGINEER.

Side-Hill Spoil

- TP.17.2.5 All spoil from side-hill cuts shall be returned to their original locations.

Access Road Material

- TP.17.2.6 All temporary means of access to or along the right-of-way (rip-rap, geo-textile, granular cover) shall be removed by the CONTRACTOR and disposed of as specified by the ENGINEER.

Vegetation

- TP.17.2.7.1 All damaged tree branches or roots should be cleanly removed with a pruning saw and tree surgeon paint applied to the cuts as soon as possible to minimize infection and speed callus formation.
- TP.17.2.7.2 The CONTRACTOR may be required by the COMPANY to fertilize, seed and/or replant the construction right-of-way and extra work space areas used during construction. Seedlings, seed and fertilizer to be used for this purpose shall be specified by the ENGINEER and purchased by the COMPANY.

Streets/Roads

- TP.17.2.8 Where the pipeline has been laid within street and improved road right-of-ways, the surface of such streets and right-of-ways shall be restored using new materials equal to or better than the original materials to the satisfaction of the authorities having jurisdiction.

Soils

- TP.17.2.9 Restoration of subsoil and topsoil is specified under TP.4 Soil Handling.

Skips

- TP.17.2.10.1 Clean-up progress reports shall only show the amount of continuous clean-up from the starting point to the first section skipped. The only exception to this is where a short skip is warranted due to poor ground conditions. The clean-up progress can be reported as complete in this instance, however, only upon obtaining written approval from the COMPANY.
- TP.17.2.10.2 It is understood that when such skips are permitted, the CONTRACTOR agrees to complete the clean-up at the skips, at no additional cost, as soon as ground conditions permit or upon the ENGINEER'S request.

TP.17.3 Basis of Payment

- TP.17.3.1 The work described in this Specification will be paid for as part of the Proposal. No separate payment for Clean-up will be made.
- TP.17.3.2 Payment will be made in stages, up to but not beyond the current point of clean-up.
- TP.17.3.3 The CONTRACTOR'S actual cost of seedlings, seed, fertilizer and extra topsoil will be reimbursed upon submission of the proper invoices to the ENGINEER

TECUMSEH GAS STORAGE
PIPELINE CONSTRUCTION SPECIFICATION

93-TP.18 - Drainage Tiles

TP.18.1 Work Covered

This shall include all labour necessary to replace and repair drainage tiles.

TP.18.2 Construction Procedure

Compliance

TP.18.2.1 Following pipeline installation, the CONTRACTOR shall repair or replace ALL damaged drainage tile to the complete satisfaction of the COMPANY, LAND OWNER and/or TENANT.

General

TP.18.2.2 Tile repair crews shall follow closely behind the backfill operation.

Tile Engineer

TP.18.2.3.1 A Drainage Tile Inspector shall be provided by the COMPANY and will consult with the LANDOWNER to ascertain the number, location and depth of all existing and planned drainage tiles prior to construction. The ENGINEER shall also consult with the municipality having jurisdiction to ascertain the location of any future municipal drains.

TP.18.2.3.2 The Drainage Tile Inspector will review the method of tile repair with each affected LANDOWNER and/or TENANT prior to construction and will inspect and approve the tile repairs during construction.

Restoration

TP.18.2.4.1 Any drainage tile damaged, cut or removed shall be repaired in accordance with Figure 18.2-A.

TP.18.2.4.2 The COMPANY will supply all repair materials.

TP.18.2.4.3 A suitable transition tile and carrier pipe shall be installed at the same grade and elevation the original tile.

TP.18.3 Basis of Payment

The work described in this section will be paid for on a unit basis as outlined under Tile Repair in the BID FORM.



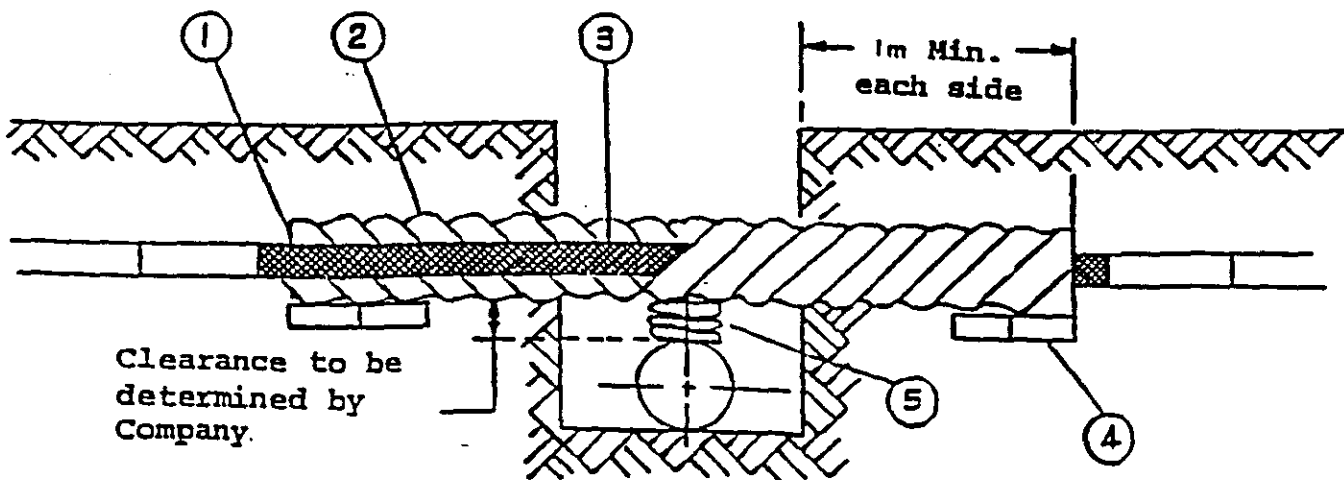
TECUMSEH GAS STORAGE

P.O. BOX 520, COLUMBIA, IOWA 52001-0520

Pipeline Construction Specification 93-TP.18

Figure 18.2-A

TILE DRAIN RESTORATION



1. Void between tile and corrugated carrier pipe to be sealed with plastic, fiberglass wrap, or approved equal.
2. Carrier pipe to be perforated, corrugated, 16 gauge galvanized steel (ARMCO'S "HEL-COR" or approved equal), installed so that the holes are centred on each side of bottom of pipe.
3. Transition tile to be inserted inside carrier pipe and joined to open ends of drain tile.
4. End of carrier pipe to bear on undisturbed soil for a minimum of 460 mm (18") and two 205 mm x 102 mm x 460 mm (8" x 4" x 18") solid concrete blocks with 102 mm (4") wide pressure treated cedar wedges.
5. Backfill to be hand tamped in 152 mm (6") layers around carrier pipe. Sand bags to be installed between pipeline and carrier pipe.
6. All repair materials to be supplied by the Company.

DESIGN SPECIFICATIONS

Description

1. The objective of this application is to obtain the Board's approval to install approximately 4500m of NPS 20 pipe from EGD's Tecumseh Compressor Station to the Ladysmith Storage Pool. The proposed pipeline is entirely within St. Clair Township in Lambton County. It begins at EGD's Tecumseh Compressor Station (North part of Lot 19, Concession 7) and ends at the Ladysmith Natural Gas Storage Pool (Lot 20, Concession 5). The pipeline route generally follows existing lot lines, requires one road crossing (Moore Road 6), one hydro corridor crossing and will cross four Union Gas pipelines.

Design and Construction

2. The pipeline and facilities will be designed, constructed, and operated in compliance with O. Reg 210/01 *Oil and Gas Pipeline Systems* and EGD's design, construction, and operating standards. The primary design standard adopted by O. Reg. 210/01 is CSA Z662-03 *Oil and Gas Pipeline Systems*.

Materials

3. All pipeline material will meet the requirements of the applicable CSA standard:
 - Z245.10-02, Steel Pipe
 - Z245.11-01, Steel Fittings
 - Z245.12-01, Steel Flanges
 - Z245.15-01, Steel Valves
 - Z245.20-02, External Fusion Bond Epoxy Coating
 - Z245.21-02, External Polyethylene Coating for Pipe

Corrosion Protection

4. External corrosion protection will be provided by a combination of external coating and cathodic protection. No special internal corrosion protection is required since the natural gas will be of transmission quality (i.e., dry, sweet).

Design Criteria

5.

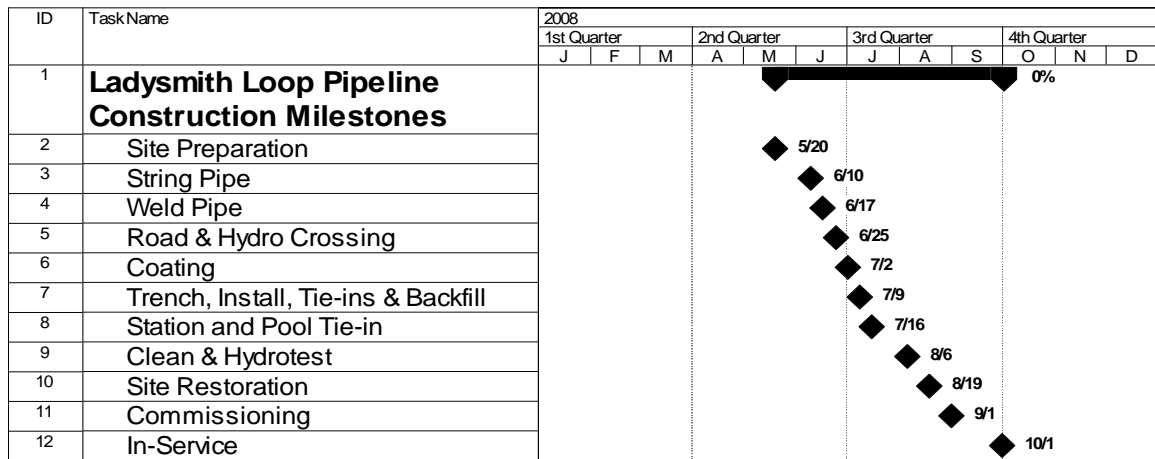
| Description | Application CSA Z662-03 Table 4.2 | |
|---|--------------------------------------|--------------------------|
| | Class 1 General | Class 1 Road Crossing |
| Combined Design & Location Factor | 0.8 | 0.6 |
| Nominal Pipe Diameter (mm) | 508 | 508 |
| Design Pressure (kPa) | 9 930 | 9 930 |
| Maximum Operating Pressure (kPa) | 9 930 | 9 930 |
| Operating Pressure Range (kPa) | 2 070 – 9 240 | 2 070 – 9 240 |
| Grade (MPa) | 414 | 414 |
| Minimum Wall Thickness (mm) | 7.6 | 10.2 |
| Fracture Category | II | II |
| Minimum Design Temperature (degC) Above Grade / Buried | M30 / M5 | M30 / M5 |
| Maximum Design Temperature (degC) | 120 | 120 |
| Hydrostatic Test Pressure (kPa) | 12 400 | 12 400 |
| Estimated Length (m) | 4400 | 100 |

HYDROSTATIC TEST REQUIREMENTS

1. The pipeline will be hydrostatically pressure tested according to CSA Z662-03 to confirm its integrity.
2. EGD is proposing to use municipal water for the pressure test supplemented by water from the Tecumseh Compressor Station fire-pond if needed.
3. EGD intends to adhere to the requirements described in the November 2007 Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool Environmental Assessment Update, section 7.0 Hydrostatic Testing, prepared by Stantec found at Exhibit B, Tab 2, Schedule 3. Permits will be obtained as necessary to take and discharge water.

PROPOSED CONSTRUCTION SCHEDULE

- The proposed construction milestones for 2008 are shown in the following Gantt Chart.



- Restoration monitoring will continue through 2009 as outlined in section 9 of the Tecumseh Compressor Station to Ladysmith Natural Gas Storage Pool Environmental Assessment Update prepared by Stantec found at Exhibit B, Tab 2, Schedule 3.

PERMITS REQUIRED

| AUTHORITY/COMPANY | PURPOSE OF PERMIT |
|--|---|
| The Corporation of the Township of St. Clair | To acquire permits to install pipeline in road allowance and cross drains under its jurisdiction. |
| Union Gas Ltd. | To acquire pipeline crossing agreement for 4 natural gas pipelines To acquire encroachment agreement to use portion of their pipeline easement for temporary working rights for pipeline construction To obtain agreement allowing Enbridge easement to overlap portion of the Union Gas existing permanent easement. |
| The Corporation of the County of Lambton | To acquire permit to remove trees. |
| Hydro One | To acquire permit to cross tower and wire easement. To acquire approval to use tower and wire easement lands for temporary working area for pipeline construction |

An affidavit of search of title for the Ladysmith Loop Pipeline can be found at Exhibit D, Tab 1, Schedule 3.

NEGOTIATIONS TO DATE

1. Beginning after the March 2007 public open house, and continuing until August 2007, EGD was engaged in discussions and negotiations with the affected landowners along the 2007 Preferred Route.
2. Meetings held during the months of April and May with the majority of landowners along the 2007 Preferred Route dealt with the review of draft documents and the proposed compensation package.
3. During the month of July these same landowners were presented with a second offer that included a Letter of Understanding concerning construction and operational matters related to the proposed pipeline and an improved compensation package.
4. As described earlier in this evidence, some of the affected landowners indicated that they did not wish for the Ladysmith Loop to be constructed across their properties, and preferred that a different route be used. No agreement was reached between EGD and most of these landowners.
5. Beginning in September 2007, EGD entered into discussions and negotiations with affected landowners along the 2007 Alternate Route.
6. To use the 2007 Alternate Route, the Company will need to acquire easements and temporary working rights from 7 of the 8 affected landowners along that route. The landowner where an easement is not required is a wholly owned subsidiary of EGD.

7. All properties are located in the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton and the landowners and property locations are shown in Exhibit A, Tab 3, Schedule 2, page 7, Table 2: Landowner Easement Agreement Status.
8. The Company has entered into Agreements to Grant Easements with all of the affected landowners, except for the Corporation of the County of Lambton. An example of the Agreement to Grant Easement form, Temporary Working Area Agreement, and Letter of Understanding can be found at Exhibits D , Tab 1 Schedules 4 to 6. The easement and temporary work area forms are similar to forms that Enbridge has used and filed previously with the Board.
9. On September 17, 2007, EGD presented a draft proposal to the County of Lambton, with a discussion of the documentation and compensation and the uncertainty as to which route was ultimately going to be used. On October 3, 2007, EGD's proposal was submitted to the County Council and was approved in principle. A formal proposal and preferred route selection has been submitted to the County for final approval in December of 2007.
10. EGD will obtain all required Permits, Agreements to Grant Easement, Easements, and Temporary Working Area Agreements for the route and location of the proposed facilities before the commencement of construction.
11. Attached are the documents relating to the *Land Registration Reform Act*, which include forms of agreement that the Company will enter into including:
 - a. The Agreement to Grant Easement
 - b. The Easement Agreement
 - c. The Temporary Working Area Agreement
 - d. Letter of Understanding

AGREEMENT TO GRANT EASEMENT

THIS AGREEMENT dated the ____ day of ____, 2007.

BETWEEN: **Landowner**

(hereinafter called the "Transferor")

Of The First Part

- and - **ENBRIDGE GAS DISTRIBUTION INC.**

(hereinafter called the "Transferee")

Of The Second Part

WHEREAS the Transferor is the registered owner in fee simple in possession, of the lands described that part of Lot __, Concession __, in the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton and Province of Ontario, being more particularly described as PIN __, hereinafter called the "Transferor's Lands").

AND WHEREAS the Transferor has agreed to grant to the Transferee an easement over a part of the Transferor's Lands, such part being 10 metre(s) in width and being hereinafter called the "Easement Lands".

WITNESSETH that in consideration of the sum of [REDACTED] being the result of multiplying the estimated number of easement hectares, rounded to two (2) decimal places, by [REDACTED] per hectare, of lawful money of Canada now paid by the Transferee to the Transferor, the receipt whereof is hereby acknowledged, the Transferor does hereby agree to sell, transfer, grant and convey in perpetuity to the Transferee an unencumbered easement in, over, upon, under and/or through the Easement Lands, to survey, lay, construct, install, operate, use, inspect, remove, ~~renew~~, replace, ~~alter~~, ~~enlarge~~, reconstruct, repair, ~~expand~~ and maintain (1) one pipeline only not to exceed NPS 20 inches in diameter including all works, appurtenances, attachments, apparatus, appliances, markers, fixtures and equipment (hereinafter collectively referred to as "Works") which the Transferee may deem necessary or convenient thereto for the transmission of gas, as defined in the OEB Act, 1998, S.O. 1998, c. 15, Schedule B, as amended from time to time, and the Transfer of Easement shall include the right of the Transferee, its successors, assigns, servants and agents to use the surface of the Easement Lands for ingress and egress on foot and/or with vehicles, supplies, machinery and equipment at any time and from time to time for the sum of [REDACTED] per hectare, rounded to two (2) decimal places. The Transferor acknowledges that this amount is full consideration for the grant of the perpetual right to use the surface of the Easement lands.

The parties hereto mutually covenant and agree each with the other as follows:

1. The location of the Easement Lands shall be selected by the Transferee, provided that the location shall not unreasonably interfere with the use by the Transferor of the remainder of the Transferor's Lands during the construction of any Works or at any time thereafter.
2. The Transferor shall, forthwith upon the request of the Transferee, execute and deliver a Grant or Transfer of Easement in favour of the Transferee in the form attached hereto as Schedule "B" together with such other and further documents of title in respect of the Transferor's Lands as may be reasonably required by the Transferee in order to complete the transaction contemplated by this agreement.

3. The Transferee shall pay the purchase price of the said Transfer of Easement to the Transferor as soon as reasonably possible after the registration thereof in the appropriate Land Registry Office.
4. Forthwith upon the execution of this agreement, the Transferee, its servants and agents shall be entitled to enter upon the Easement Lands and the transferor's Lands to survey, lay, construct, operate, use, inspect, remove, ~~renew~~, replace, ~~alter~~, ~~enlarge~~, reconstruct, repair, ~~expand~~ and maintain the Works which the Transferee may deem necessary or convenient with the right to the Transferee to remove any boulder or rock, and to sever, fell, remove or control the growth of any roots, trees, stumps, brush or other vegetation on or under the Transferor's Lands which may be encountered during such construction.
5. As soon as reasonably possible after the construction of the Works, the Transferee shall remove all surplus soil and debris from the Transferor's Lands and restore them to their former state so far as is reasonably practicable.
6. The Transferee shall compensate the Transferor for all reasonable damages suffered by the Transferor as a result of the operations of the Transferee.
7. The Transferor confirms that the pre-construction compensation agreement between the Transferor and the Transferee includes a one time payment for all disturbance damages and all crop losses to be paid to the Transferor that result from the construction and installation of the pipeline, and the Transferor and the Transferee confirm that such payment is to be paid upon commencement of pipeline construction. For clarification, damages compensated for in this clause are part of, and not in addition to, those set out in clause 7 above.
8. The Transferee will, at all times, wholly indemnify the Transferor from and against all loss, damage, injury or expense arising by reason of any damage or injury to any persons or property caused by the construction, repair, maintenance or operation under or through the Transferor's Lands, as well as imprudence, neglect or want of skill by the employees or agents of the Transferee arising out of construction, repair, maintenance or operation by the Transferee of any of its Works as aforesaid, unless the cause of such loss, damage, injury or expense can be traced elsewhere.
9. The Transferor shall have the right to use and enjoy the surface of the Easement Lands except that such use and enjoyment shall not interfere with the rights of the Transferee hereunder. Without limiting the generality of the foregoing, the Transferor shall not without prior written consent of the Transferee place or erect, or cause to be placed or erected, on the Easement Lands any building, structure or fence and shall not excavate, drill, alter the grading, install thereon any pit, well, foundation and/or pavement which will obstruct or prevent the exercise and enjoyment by the Transferee of the easement which the Transferor hereby agrees to sell, grant and convey to the Transferee.
10. The Transferor represents and warrants that to the best of the Transferor's knowledge and belief, the Easement Lands have not been used for the storage of and do not contain any toxic, hazardous, dangerous, noxious or waste substances or contaminants (collectively the "Hazardous Substances"). If the Transferee encounters any Hazardous Substances in undertaking any work on the Easement Lands, it shall immediately notify the Transferor and it shall either:
 - (a) discontinue work and at its own expense, expediently and with due diligence restore the Easements Lands to their former state to the extent reasonably practicable and following such restoration, this easement shall be terminated; or
 - (b) the Transferee shall have the option to effect the removal of such Hazardous Substances to the extent required by law in accordance with the laws, rules and regulations of all applicable public authorities, at its cost; or

- (c) subject to the restoration work as set out in clause "a" above, the Transferee and Transferor shall diligently seek an alternative location of their mutual satisfaction for the Easement Lands and Works.

The Transferee shall not bring any Hazardous Substances on the Easement Lands, except in accordance with all environmental laws. In acquiring its interests in the Easement Lands pursuant to this Easement, the Transferee shall be deemed not to acquire the care or control of the Easement Lands or any component thereof.

11. Notwithstanding any rule of law or equity, any Works constructed by the Transferee hereunder shall be deemed to be the property of the Transferee, even though the same may have become annexed or affixed to the Transferor's Lands.
12. This agreement shall be conditional upon compliance with the provisions of the Planning Act and the Ontario Energy Board Act. The Transferor agrees to execute such consents or authorizations as may be necessary for the Transferee to obtain any necessary consents from the local Land Division Committee and agrees to co-operate in any such applications for consent.
13. This agreement shall be of the same force and effect as a covenant running with the Transferor's Lands and the rights hereunder shall be appurtenant to the lands of the Transferee more particularly described in the attached Schedule "A".
14. The Spouse consents to the transaction evidenced by this instrument and releases all interest in the within lands pursuant to the provisions of the Family Law Act, R.S.O. 1990, as amended and hereby agrees to execute for such purpose the grant or transfer of easement contemplated hereby.

The Transferor, spouses of each other, consent to the transaction evidenced by this instrument and release all interest in the within lands pursuant to the provisions of the Family Law Act, R.S.O. 1990, as amended.

15. Whenever the singular or neuter is used it shall, where necessary, be construed as if the plural or feminine or masculine had been used and vice versa, as the case may be.
16. This agreement shall extend to, be binding upon and enure to the benefit of the respective heirs, executors, administrators, successors and assigns of the parties hereto.
17. The transaction contemplated hereby shall be completed by the later of:
- (a) within One Hundred and Eighty (180) days following the approval hereof under the provisions of the Ontario Energy Board Act, including any appeal periods, or
 - (b), December 31, 2008.

In the event the transaction contemplated hereby is not completed by December 31, 2008, the Transferee shall have the right to extend the term of this agreement to December 31, 2009, upon paying to the Transferor the sum of [REDACTED] being the result of multiplying the estimated number of easement hectares, rounded to two (2) decimal places, by [REDACTED] per hectare.

18. This agreement shall be null and void upon the registration of the Transfer of Easement as contemplated herein.

IN WITNESS WHEREOF, the parties hereto have executed this agreement.

WITNESS: Terry Chupa

WITNESS: Terry Chupa

ENBRIDGE GAS DISTRIBUTION INC.

I/We have the authority to bind the
corporation.

SCHEDULE "A"

TRANSFeree'S LANDS - DOMINANT TENEMENT

In the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton and Province of Ontario and being composed of the north twenty (20) acres of the east quarter of Lot Nineteen (19) in Concession Seven (7) of the said Township which may be more particularly described as follows:

PREMISING that the bearings herein are astronomic and are referred to the meridian through the Southeast corner of Lot Thirteen (13) in the Fifth (5th) Concession of the Township of Moore (longitude $82^{\circ} 19' 43''$ W) and relating all bearings herein thereto:

COMMENCING at the Northeast angle of said Lot Nineteen (19);

THENCE north eighty-eight degrees forty minutes west ($N 88^{\circ} 40' W$) along the north limit of said Lot Nineteen (19) a distance of four hundred and ninety-three point six feet (493.6') to the Northwest angle of the east quarter of said Lot Nineteen (19);

THENCE south one degree thirty-nine minutes twenty seconds west ($S 1^{\circ} 39' 20'' W$) along the line between the east one-quarter and the west three-quarters of Lot Nineteen (19) aforesaid a distance of one thousand seven hundred and sixty-five point zero feet (1,765.0') to a point where a standard iron bar has been planted;

THENCE south eighty-eight degrees forty minutes east ($S 88^{\circ} 40' E$) parallel to the north limit of said Lot Nineteen (19) a distance of four hundred and ninety-three point six feet (493.6') to a point in the east limit of said Lot Nineteen (19) where a standard iron bar has been planted;

THENCE north one degree thirty-nine minutes twenty seconds east ($N 1^{\circ} 39' 20'' E$) along the east limit of said Lot Nineteen (19) a distance of one thousand seven hundred and sixty-five point zero feet (1,765.0') to the POINT OF COMMENCEMENT.

SCHEDULE "B"

INTEREST/ESTATE TRANSFERRED

1. The Transferors hereby transfer, sell, grant and convey in perpetuity to the Transferee, its successors and assigns, a free and unencumbered easement in, over, upon, under and/or through the lands described herein, hereafter referred to as the Easement Lands, to survey, lay, construct, install, operate, use, inspect, remove, ~~renew~~, replace, ~~alter~~, ~~enlarge~~, reconstruct, repair, ~~expand~~ and maintain (1) one pipeline only not to exceed NPS 20 inches in diameter including all works, appurtenances, attachments, apparatus, appliances, markers, fixtures and equipment (hereinafter collectively referred to as "Works") which the Transferee may deem necessary or convenient thereto for the transmission of gas, as defined in the OEB Act, 1998, S.O. 1998, c. 15, Schedule B, as amended from time to time. This Transfer of Easement shall include the right of the Transferee, its successors, assigns, servants and agents to use the surface of the Easement Lands for ingress and egress on foot and/or with vehicles, supplies, machinery and equipment at any time and from time to time.
 2. The Transferee shall have the right at any time and from time to time to remove any boulder or rock and to sever, fell, remove or control the growth of any roots, trees, stumps, brush or other vegetation on or under the Easement Lands.
 3. The rights of the Transferee herein shall be of the same force and effect as a covenant running with the Easement Lands and shall be appurtenant to the lands and premises described in this Schedule as the Transferee's Lands.
 4. The Transferee shall have the right to assign or transfer its rights hereunder in whole or in part.
 5. This Transfer shall extend to, be binding upon and enure to the benefit of the estate trustees, successors and assigns of the parties hereto. If the Transferors are not the sole owners of the Transferor's Lands, this Transfer shall bind the Transferors to the full extent of their interest therein and shall also extend to any after-acquired interest but all monies payable or paid to the Transferors hereunder shall be paid to the Transferors only in the proportion that their interest in the Transferor's Lands bears to the entire interest therein.
- The Transferors hereby agree that all provisions herein are reasonable and valid and if any provision herein is determined to be unenforceable, in whole or in part, it shall be severable from all other provisions and shall not affect or impair the validity of all other provisions.
6. The Transferors shall have the right to use and enjoy the surface of the Easement Lands except that such use and enjoyment shall not interfere with the rights of the Transferee hereunder. Without limiting the generality of the foregoing, the Transferors shall not, without the prior written consent of the Transferee, place or erect on the Easement Lands any building, structure or fence and shall not excavate, alter the grading, drill, install thereon any pit, well, foundation and/or pavement which will obstruct or prevent the exercise and enjoyment by the Transferee of its rights hereunder.
 7. Notwithstanding any rule of law or equity, any Works constructed by the Transferee shall be deemed to be the property of the Transferee even though the same may have become annexed or affixed to the Easement Lands.
 8. The Transferee shall at its own expense as soon as reasonably possible after the construction of any Works or other exercise of its rights hereunder, remove all surplus sub-soil and debris from the Easement Lands and restore them to their former state so far as is reasonably practicable.

The Transferee shall compensate the Transferor for all reasonable damages suffered by the Transferor as a result of the operations of the Transferee.

The Transferor confirms that as provided in the preceding paragraph, the Transferee has made a one time payment to the Transferor for all disturbance damages and all crop losses to be paid to the Transferor as a result of the construction and installation of the pipeline.

The Transferee will, at all times, wholly indemnify the Transferor from and against all loss, damage, injury or expense arising by reason of any damage or injury to any persons or property caused by construction, repair, maintenance or operation under or through the Transferor's Lands, as well as imprudence, neglect or want of skill by the employees or agents of the Transferee arising out of construction, repair, maintenance or operation by the Transferee of any of its Works as aforesaid, unless the cause of such loss, damage, injury or expense can be traced elsewhere.

9. The Transferors covenant that

- (i) they have the right to convey the rights hereby transferred to the Transferee;
- (ii) the Transferee shall have quiet enjoyment of the rights hereby transferred;
- (iii) the Transferors or their successors and assigns will execute such further assurances and do such other acts (at the Transferee's expense) as may be reasonably required to vest in the Transferee, the rights hereby transferred; and
- (iv) the Transferors have not done, omitted or permitted anything whereby the Easement Lands is or may be encumbered (except as the records of the land registry office disclose).

10. The Transferor represents and warrants that to the best of the Transferor's knowledge and belief, the Easement Lands have not been used for the storage of and do not contain any toxic, hazardous, dangerous, noxious or waste substances or contaminants (collectively the "Hazardous Substances"). If the Transferee encounters any Hazardous Substances in undertaking any work on the Easement Lands, it shall immediately notify the Transferor and it shall either:

- (a) discontinue work and at its own expense, expediently and with due diligence restore the Easements Lands to their former state to the extent reasonably practicable and following such restoration, this easement shall be terminated; or
- (b) the Transferee shall have the option to effect the removal of such Hazardous Substances to the extent required by law in accordance with the laws, rules and regulations of all applicable public authorities, at its cost; or
- (c) subject to the restoration work as set out in clause "a" above, the Transferee and Transferor shall diligently seek an alternative location of their mutual satisfaction for the Easement Lands and Works.

The Transferee shall not bring any Hazardous Substances on the Easement Lands, except in accordance with all environmental laws. In acquiring its interests in the Easement Lands pursuant to this Easement, the Transferee shall be deemed not to acquire the care or control of the Easement Lands or any component thereof.

11. Whenever the singular or neuter is used it shall, where necessary, be construed as if the plural or feminine or masculine had been used and vice versa, as the case may be.

TRANSFeree'S LANDS (DOMINANT TENEMENT)

In the Geographic Township of Moore, in the Township of St. Clair, in the County of Lambton and Province of Ontario and being composed of the north twenty (20) acres of the east quarter of Lot Nineteen (19) in Concession Seven (7) of the said Township which may be more particularly described as follows:

PREMISING that the bearings herein are astronomic and are referred to the meridian through the Southeast corner of Lot Thirteen (13) in the Fifth (5th) Concession of the Township of Moore (longitude $82^{\circ} 19' 43''$ W) and relating all bearings herein thereto:

COMMENCING at the Northeast angle of said Lot Nineteen (19);

THENCE north eighty-eight degrees forty minutes west ($N 88^{\circ} 40' W$) along the north limit of said Lot Nineteen (19) a distance of four hundred and ninety-three point six feet (493.6') to the Northwest angle of the east quarter of said Lot Nineteen (19);

THENCE south one degree thirty-nine minutes twenty seconds west ($S 1^{\circ} 39' 20'' W$) along the line between the east one-quarter and the west three-quarters of Lot Nineteen (19) aforesaid a distance of one thousand seven hundred and sixty-five point zero feet (1,765.0') to a point where a standard iron bar has been planted;

THENCE south eighty-eight degrees forty minutes east ($S 88^{\circ} 40' E$) parallel to the north limit of said Lot Nineteen (19) a distance of four hundred and ninety-three point six feet (493.6') to a point in the east limit of said Lot Nineteen (19) where a standard iron bar has been planted;

THENCE north one degree thirty-nine minutes twenty seconds east ($N 1^{\circ} 39' 20'' E$) along the east limit of said Lot Nineteen (19) a distance of one thousand seven hundred and sixty-five point zero feet (1,765.0') to the POINT OF COMMENCEMENT.

TEMPORARY WORKING AREA AGREEMENT

THIS AGREEMENT dated the ____ day of ____, 2007.

BETWEEN: **Landowner** (hereinafter called the "Owner")

AND **ENBRIDGE GAS DISTRIBUTION INC.** (hereinafter called the "Company")

WHEREAS:

- 1. The Company intends to construct and install a pipeline for the transmission of natural and/or manufactured gas through Lot __, Concession __, in the Geographic Township of **Moore**, in the Township of **St. Clair**, County of **Lambton**, Province of Ontario.
- 2. To facilitate the construction of such a pipeline, the Company requires a temporary working area approximately 15 metres in width, adjacent to the 10 metre wide permanent pipeline easements. The Company also requires additional temporary work area(s) as set out below, including the primary TWA:

| <u>LOCATION</u> | <u>REASON</u> consideration | <u>DIMENSIONS</u> | | <u>AREA(hc)</u> | <u>RATE/hc.</u> | <u>AMOUNT</u> |
|-----------------|--------------------------------|-------------------|-----------------|-----------------|-----------------|---------------|
| | | <u>length(m)</u> | <u>width(m)</u> | | | |
| | | | | 0 | | |
| Totals | | | | 0 | | |

3. The Owner is the owner of the lands adjacent to the pipeline easement and has agreed to allow the Company to use such working area to construct and install the pipeline and further the Owner agrees that in the event reasonable additional Temporary Working Area is required or inadvertently used, the Owner will grant the use of these additional lands under the same terms and conditions, subject to the provisions contained in the Letter of Understanding.

NOW THEREFORE THIS AGREEMENT provides that in consideration of the sum of: _____ the receipt of which is hereby acknowledged, and for a payment of: _____ per hectare, due only at the time of commencement of the pipeline construction, the Owner hereby agrees to permit the Company, its employees and agents, with or without vehicles and/or machinery, to enter upon, use and otherwise occupy the said Temporary Working Area during the period of construction of the pipeline. The Owner hereby acknowledges and accepts that the above mentioned payment includes complete compensation for disturbance damages and crop losses caused by the operations of the Company.

The Company agrees that at its own expense it will make all grading, repairs and replacements necessary to restore the lands to as near its original condition as is practicable, upon the termination of such work. The Company shall pay for all damages caused by its operations that are additional to those already compensated for in the per acre amount described above.

This Agreement shall enure to the benefit of, and be binding upon the parties hereto, and each of them, their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, the parties have executed this Agreement.

| WITNESSED BY | OWNER(S) |
|---------------------------------|---------------------------------------|
| Terry Chupa (yy,mm,dd) | (yy,mm,dd) |
| Terry Chupa (yy,mm,dd) | (yy,mm,dd) |
| | ENBRIDGE GAS DISTRIBUTION INC. |
| (yy,mm,dd) | (yy,mm,dd) |
| (yy,mm,dd) | (yy,mm,dd) |

INTRODUCTION

It is the policy of Enbridge ("the Company") that landowners, ("the Landowners") affected by its pipeline projects be dealt with in a consistent manner that is fair to both parties.

This Letter of Understanding ("LOU") represents the Company's commitment to that objective and it will observe the following guidelines in its dealings with the Landowners on the Ladysmith Pool to Tecumseh Compressor Station – NPS 20 Project ("the Project").

This LOU is subservient to and does not alter or diminish or increase the rights and obligations of the parties to the Agreement to Grant Easement, Transfer of Easement and Temporary Working Area Agreements entered in to by the Landowner and the Company.

GENERAL PIPELINE PROCEDURES

1. Introduction of Project

Prior to construction, the Company's Project Manager or designated agent shall visit with each affected Landowner to review the timing of construction and discuss site specific issues and implementation of mitigation and rehabilitation measures in accordance with the provisions of this agreement

2. Landowner Representative

A Landowner Representative that is approved by the Company and by the Landowners affected by the project, shall be selected by and compensated by the Company. The Landowner Representative is to be on site at a frequency and duration that is satisfactory to the affected Landowners and the Company, to monitor construction with respect to all practical matters as it affects Landowners, and shall be available to the Landowners and the Company at all reasonable times.

In the event that an issue arises that cannot be resolved between the Landowner Representative and the Project Manager, then the Project Manager shall contact the affected Landowner(s) for resolution of the impasse. In the event the Landowner(s) is/are not available, then the Project Manager shall contact Enbridge's Land Agent/Land Contracts Manager, for resolution of the impasse, or in the event the Land Agent/Land Contracts Manager is not available, a suitable manager from Gas Storage Operations.

Duties

- To receive and record all landowner complaints and/or concerns and relay any such items to the Project Manager and/or the on site representative of the Contractor

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- Upon request of the Landowner, to inspect any tile drain repairs or to make any necessary arrangements to have the Landowner inspect such repairs after normal working hours;
- To act in accordance with the Wet Weather Shut Down Procedure, as further described in this Letter of Understanding; and,
- To inspect the Easement for any areas which may be unsuitable for further work until soil conditions are more satisfactory.

The Landowner Representative will be compensated as follows:

- A basic payment will be made for every day, or part thereof, that the construction contractor is on site and active. This payment is expected to cover, but is not limited to, such items as office expenses, cellular and other telephone charges, administrative expenses and transportation; and
- an hourly rate will be paid for the time spent on site, with a minimum charge of 2 hours per day when on site.

3. Testing For Soy Bean Cyst Nematode (SCN)

Prior to construction, the Company will conduct a pre-construction soil sampling program, as set out in the Environmental Assessment for the Project, to determine if SCN is present within the agricultural Easements along the pipeline route of the Project.

Additionally, any imported topsoil will have a composite sample analyzed for SCN before it is placed on the right-of-way and the Company will provide a report of the test results to the Landowner. This procedure should be as set out in the Environmental Assessment for the Project, if one exists.

In the event the report indicates the presence of SCN, the Company, the Landowner and the Landowner Representative will work with OMAFRA and the University of Guelph to develop a best practices protocol to handle SCN where detected and will employ the most current, best practice, at the time of construction.

4. Imported Top Soil

In the event that top soil is imported on to the Landowners property by the Company, the Company shall ensure that the top soil is natural, cultivated, medium loam, neither clay or sandy in nature, capable of heavy agricultural growths and be from a source approved by the Landowner, such approval not to be unreasonably withheld.

PIPELINE CONSTRUCTION PROCEDURES

The Company will abide by the following pipeline construction procedures:

1. The Company shall notify all Landowners of the scheduled start of construction prior to the Pipeline Installation Contractor (“the Contractor”) moving equipment onto the permanent Easement and Temporary Working Areas.
2. The Company will use construction techniques that provide the pipeline with a minimum of 1.2 metres of coverage from the surface of the top soil.

In the event it is determined that a section of the pipeline, in excess of 10 metres in length, was installed at a depth of less than 1.2 metres of coverage, then the Company shall provide a depth of cover of one (1.2) metres with the importation of topsoil or by lowering the pipe, or by some other means that is to the mutual satisfaction of the Landowner and the Company, but the method used shall be at the option of the Landowner.

In the event it is determined that a section of the pipeline that is less than 10 metres in length was installed at a depth of less than 1.2 metres of coverage, the Company shall provide a depth of cover of one (1.2) metres with the importation of topsoil or by lowering the pipe or by some other means that is to the mutual satisfaction of the Landowner and the Company, but the method used shall be at the option of the Company,

The Landowner may not alter the grade without the Company’s consent.

3. Where possible, excavation for the pipeline trench will be performed by a wheel machine. Excavation at road crossings, pipeline crossings, other crossings, at tie in spots and other similar locations, will be done by a hoe type machine.
4. On present and proposed agricultural lands, the Company will undertake appropriate survey techniques as performed by, or under the supervision of, a registered land surveyor to establish pre-construction grades along the pipeline trench with the view to restoring soils to that grade as far as is reasonably practicable so as to match the abutting unaffected land grades.

Upon the request of the landowner, the Company will provide the landowner with a copy of this survey.

5. The Company agrees to strip the topsoil from the permanent pipeline easement, (“the Easement”) and from a portion of the Temporary Working Area (“the TWA”) to provide a work area on subsoil for vehicles, equipment and personnel. In order to prevent mixing, the stripped topsoil will be placed on undisturbed topsoil in the TWA

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So as to minimize mixing with the top soil, the subsoil will be placed on the stripped portion of the Easement and/or the TWA lands at the discretion of the Company, and the Company will exercise due diligence to ensure that top soil and subsoil are not mixed.

At the request of the Landowner, the Company will provide a layer of mulch, crop or other suitable alternative between the existing topsoil and the stripped topsoil pile in situations where a crop is not present.

6. The Company confirms that restoration of the construction area is the responsibility of the Company and the Landowner acknowledges that restoration work may be included in the contract between the Company and the Contractor
7. On backfilling the trench, sub-soils are to be returned first, followed by the topsoil. After filling the trench with sub-soil the Pipeline Installation Contractor will compact those materials along the length of the trench using equipment satisfactory for that purpose. Following this, the Contractor will top up the trench with sub-soil and then remove any excess materials from the easement area. The Landowner shall have the right of first refusal on any such excess material. The Contractor will then para-plough all of the stripped lands, including the trenched area, and pick stones prior to the replacement of the topsoil. The topsoil will then be returned to the area from which it was stripped.

After topsoil replacement, the entire Work Area will be para-ploughed and any stones 75 mm (3") in diameter and larger will be picked by hand and/or with a mechanical rotary stone picker. If requested by the Landowner, the Company will then cultivate the topsoil and, again, pick stones, 75 mm (3") and larger.

8. If requested by the Landowner, the Company will return in the year following restoration and chisel plough or cultivate the Easement lands to the depth of the topsoil and pick any stones 75 mm (3") in diameter and larger by hand and/or with a mechanical rotary stone picker.

To accommodate farming operations, it is often preferred that the Landowner perform these cultivating and/or chisel ploughing operations themselves at the Company's expense, provided the need for this work and the rates to be charged have been agreed upon in advance.

9. The Company will place boundary stakes at 30 metre increments prior to construction to mark the outside limits of the Easement and Temporary Working Area, ("the Work Area").

Unless otherwise agreed to by the Landowner and the Company, the Company and

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its agents directly involved in the construction of the pipeline shall be limited to conducting construction operations within the Work Area. In the event that vehicles or equipment involved in construction operations travel on lands beyond the Work Area, the Company shall compensate the Landowner for such extra land used at two times the rate used to determine compensation for the Temporary Working Area. Where any such incident occurs, it shall be brought to the attention of the Project Manager and/or the Enbridge Land Agent/Land Contracts Manager in a timely manner so that it may be confirmed and the affected area measured.

Compensation for such incidents will be subject to a minimum payment of \$500.00 for each separate incident. A single, construction operation related incident could result in travel on several, non-contiguous areas of land beyond the Work Area simply because of the nature of that construction activity. In such instances, the lands involved will be measured and aggregated as one incident. The Company will not pay compensation for any non-Work Area for which such compensation has already been paid.

For clarification, this additional compensation is intended to confine pipeline construction operations to the Temporary Working Area and Permanent Easement and does not apply to ancillary operations such as, but not limited to, surveying, tile installation and repairs and related drainage operations, the activities of the Landowner representative, soil studies, etc.

10. If, upon completion of the work contemplated herein, soil or other environmental conditions, are adverse to the point that both the Company and the Landowner agree that completion of the restoration work cannot be performed in a satisfactory manner at that time, then, either the Company or the Landowner may request that the topsoil remain piled until the following year, or other mutually agreed upon time, and then back filled such that the Easement lands are returned to the surrounding grade.

In the event that the Work Area or a portion thereof is over-wintered, the Company shall compensate the Landowner for loss of crop production based on the acreage not planted due to the over-wintering multiplied by the gross per acre value of the abutting crop.

11. The Company agrees to implement proper construction practices, appropriate environmental mitigation measures and cleanup procedures, including those agreed to herein, to minimize injury and damage to the land and to future crops.
12. The Company shall install a temporary fence at in areas where livestock is kept, in order to prevent entry onto the Work Area while construction is ongoing. During construction, the Company agrees to provide water for livestock when temporary fencing has cut off the normal supply of water.

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13. In addition to stripping top soil from the Work Area as set out in the Pipeline Construction Procedures above, the Company shall inform the Contractor that vehicles are to travel on the proposed trench line location where possible and practical and that vehicle travel outside of the Work Area are subject to the penalties as set out in the Pipeline Construction Procedures above.

14. The Company will make all reasonable efforts to minimize the length of open trench and, in any event, that the maximum length of open trench will not exceed three kilometres at any time.

Where the trench is left open overnight and is located close to residences the Company shall install barriers to reduce risk of injury to the public.

15. All spoil, such as blue clay, from road and creek bores and bore pits that is not of the same soil type as the sub-soil horizon directly above it, will be removed so as not to contaminate sub-soil or the topsoil. In conjunction with these bores, the topsoil will be stripped in the affected area so that no mixing will occur.

16. The Company, unless otherwise agreed to with the Landowner, will ensure that any significant volumes of water which may accumulate on the Easement during construction will not be released into an existing tile drain, or released onto the surface of the land in a manner that will damage the land, crops or other improvements of the Landowner.

This may, however, be accomplished through the installation of temporary tiles or other satisfactory means. The Company will provide the Landowner with a proposed temporary tiling plan for review.

If the Landowner gives the Company permission to pump into an existing tile, the water will be filtered.

17. The Company will reset any survey monuments which are removed or destroyed during pipeline construction.

18. It is understood that the Company is required to adhere to all of the conditions set out in the Leave to Construct Order of the Ontario Energy Board and that these conditions are additional undertakings to those that the Company has agreed upon with the Landowners on the Project.

If requested by the Landowner, a copy of the conditions set out in the Leave to Construct order will be mailed to the Landowner as soon as it is available.

19. Where private water or utility lines are planned to be interrupted, the Company will supply temporary service to the affected Landowners prior to service interruption.

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In the case of accidental interruption, temporary services will be provided by the Company at the earliest possible opportunity.

20. The Company agrees not to use any laneways and culverts owned by the Landowner for the moving of heavy equipment without the prior consent of the Landowner.

The Company shall, at its own expense, repair any damage to private accesses caused by pipeline construction activities to the Landowner's reasonable satisfaction, including any recurring damage directly attributable to construction (i.e. subsidence).

21. Where construction or repair interferes with access to household and farm operations, the Company shall leave 'hard plugs' across the trench and having reasonable spacing, to permit the Landowner continuous access to non-Easement portions of the land. Where appropriate, steel plates may be used to provide temporary access across the pipeline trench.

22. The Company agrees to abide by the Wet Soil Shut Down Procedure, as detailed in Schedule "A" attached hereto.

TILE DRAINS

1. Repairs and Restoration of Existing Drainage System

The Company will repair and restore all field drainage systems and municipal drains impacted by construction to their original performance to the extent that is reasonably practicable and will be responsible for remedy, in consultation with the Landowner and an independent drainage consultant, of any reasonable drainage problem that is created by the existence of the pipeline.

The Company will be responsible for any defects in the integrity and performance of drain tiles installed or repaired in conjunction with construction, operation or repair, provided the defects are caused by the Company's activities, faulty materials or faulty workmanship.

Where practicable, the Company may increase the depth of the pipeline installation so as not to interfere with the operation of existing drainage systems.

Where the Landowner, acting reasonably, believes that there may be a drainage problem arising from the Company's operations, repairs, replacement and restoration work, the Company will investigate the area of concern, and repair deficiencies that are a result of the operations of the Company, to the Landowner's satisfaction, acting reasonably.

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Where practicable, prior to backfilling, all installations and repairs made by the Company may be inspected by the Landowner or his/her designate. The Company will provide the Landowner or his/her designate advance notice of the tile repair schedule.

2. Design and Installation of New Drains Required for Existing or Proposed Drainage Systems

The Company agrees to meet with the Landowner prior to the commencement of construction to determine if there is a need to retain the services of a mutually acceptable, qualified, and independent drainage consultant, ("the Drainage Consultant"), to work with the Landowner and the Company to develop a mutually acceptable drainage design and installation plan within, or abutting, the Work Area.

If a plan is required, it should include new tiles to be installed and be designed to maintain the effectiveness of the drainage system currently in place, both during and after the installation of the pipeline to a level comparable to the abutting land, and/or to facilitate future drainage plans.

If the plan is implemented, the drainage Consultant will certify that the construction accords with the plan.

The plans of the Drainage Consultant should also consider such items as:

- (i). Identify areas where drainage problems may be created as a result of the pipeline installation. The Drainage Consultant will develop a plan to mitigate these impacts provided that the Landowner is agreeable to any works required for this installation.
- (ii). Should the Project result in additional cleared lands on the property that now can and will be farmed, the Landowner and the Company will work with the Drainage Consultant to determine whether a drainage system should be installed in those cleared lands. A key consideration in that determination will be the existence and proximity of an effective 'take away' point or points into which the installed system can drain.

If there is an acceptable take away point available, the Company will, at the request of the Landowner, develop a plan to drain these newly cleared lands to, at least, the standard of the immediately adjacent farmed lands on that property. In this circumstance the Company will pay for the cost of installing the drainage system required to drain those lands and pay an additional reasonable amount, up to half of this cost, towards the cost of tying this new system into the take away point or points.

The Company, however, will not install any drainage system to drain any lands other than those newly cleared lands. In addition, where necessary, the Company

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will build, and the Landowner will maintain, small berms at the edge of the easement to ensure that the drainage system does not drain any adjacent woodlots, wetlands or other environmentally sensitive areas.

3. General Drain Tile Considerations

In areas where topsoil has been stripped, and at the request of the Landowner, the Company will complete post-construction tile installation and repairs prior to topsoil replacement.

The installation of tile shall be performed by a licensed drainage contractor. The Company will consult with the Landowner and the Landowner Representative to mutually develop a list of acceptable tile drainage contractors to be used before, during and after construction.

Where new header tiles are required, they will be installed using a trench method to ensure that all field tiles are located and connected as required by the tile plan. The downstream end of cut tile will be plugged and the upstream, end will be connected to the header tile, unless circumstances dictate otherwise. Such work will occur as soon as is practicable.

Any intercepted drains that are not part of the header tile system will be connected or plugged.

The Company will attempt to minimize the number of new tile installations that would cross the Easement.

The Company will provide the Landowner with the most recent specifications concerning tile support systems for existing tile across the trench. The method of support will be agreed upon between the Landowner and the Drainage Consultant during the pre-construction visit.

The Company will provide the Landowner with a copy of the as-built drainage plans.

FENCES

After construction, the permanent fences shall be repaired using standard nine wire page fence, barb wire, and fence posts of 6" diameter minimum and anchor posts of 8" diameter minimum or as set out by the township fence viewers or, at the request of the Landowner, repaired with fencing materials which match the existing fence on the property.

WATER WELLS

To ensure that the quality and quantity (i.e. static water levels) of well water is maintained, dug wells within 100 metres of the proposed pipeline will be tested by the Company. All samples will be taken and analyzed by an independent laboratory. A copy of the water well report will be made available to the Landowner on or before the filing of the final post-construction monitoring report.

Should a potable water well be significantly damaged (quantity and/or quality) by the pipeline installation, a potable water supply will be provided by restoring or replacing such water well, whichever is required.

POST CONSTRUCTION MONITORING AND MAINTENANCE OF WORK AREA

1. If after 2 years of crop growth, yield or quality of the crops is substantially reduced on the lands affected by the pipeline construction, the Company agrees to retain an independent consultant to conduct tests along that portion of the pipeline that is experiencing the above mentioned reduction in yield or quality, to monitor soils and crop productivity and shall implement a remediation program for that area, if one is established by the consultant.

As part of this testing, a soil specialist will conduct comparative compaction testing of the subsoil, NPK (nitrogen, phosphorus, potassium) testing and testing of PH levels on and off the Easement.

If it is suspected that the problem relates to soil compaction caused by the operations of the Company, the Company shall retain an independent soils specialist to conduct compaction testing of the subsoils on and off the Work Area and further agrees to implement a proper subsoil remediation program if signs of this compaction exist beyond an acceptable level.

2. If there is greater than 50% crop loss after five years, the Company will work with the Landowner to attempt to resolve the problem. If a resolution cannot be reached, the Company will retain an independent soils consultant satisfactory to both parties to develop a prescription to rectify the problem. This may include the importation of topsoil.
3. The Easement through woodlots will be brushed out on a regular basis, either within a 7 metre strip centered over the pipeline or across the full width of the Easement which was initially cleared for construction.
4. The Company periodically conducts depth of cover surveys of the pipeline. Where it is determined that cover over the pipeline becomes less than one (1.2) metres, the Company should restore depth of cover to one (1.2) metres with the importation of

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topsoil or by lowering the pipe or by some other means to the mutual satisfaction of the Landowner and the Company.

The Landowner may not alter the grade without the Company's consent.

5. If trench subsidence occurs following construction, the following guidelines will be observed:
 - 0-4 inches - no additional work or compensation
 - greater than 4 inches - the Company will strip the topsoil, fill the depression with subsoil and replace the topsoil. If it is deemed to be cost effective, the Company may repair the settlement area by filling it with additional topsoil.
6. If mounding over the trench persists in the year following construction, the following guidelines will be observed:
 - 0-4 inches - no additional work or compensation
 - greater than 4 inches - the Company will strip the topsoil, remove any excess subsoil and replace the topsoil.
7. If pipeline construction causes the restriction of the natural surface flow of the water, due to too much or not enough subsidence, irrespective of the 4 inch level noted above, the Company will remove the restriction by one of the methods described above.

COMPENSATION

The Company's compensation package for the Easement and the Temporary Working Area is outlined on the attached Schedule "B". (Removed for Confidentiality Reasons)

LAND RIGHTS

Land rights required for the pipeline construction include permanent interests, such as the pipeline easement that is a limited interest in the affected lands, and also includes temporary land use agreements.

In receiving payment for land rights, the Landowner shall be responsible to ensure that his/her tenant, if applicable, is advised of and complies with the terms of the Easement and the Temporary Work Area land use agreement. The Landowner shall assist the Company in obtaining, a registrable postponement of all mortgages to the Easement.

DISTURBANCE DAMAGES

Pipeline construction can result in some unavoidable interference and disruption with the Landowners usual activities, operations and enjoyment of their property.

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Disturbance damages compensates the Landowner for these tangible and intangible items, that are site-specific in nature and that recognize the particular circumstances of the use being interfered with, such as, but not limited to, continued goodwill with the Company, general inconvenience, lost time for negotiations and interrupted access, and in farming operations for such items as restricted headlands, extra applications of fertilizer, extra tillage, extra planting and cultivation and extra harvesting, and in non-agricultural land uses such as residential areas, such items as front lawns, specimen trees, structures, etc.

CROP LOSSES

Even though the Company makes every effort to minimize environmental impacts during construction and to restore the Easement, it is recognized that there can be unavoidable damages to crops on cultivated land for several years into the future. (Removed for Confidentiality Reasons)

An up-front lump sum compensation is payable to the Landowner in the year of construction to offset the possible reduced agricultural yields on the Easement and Temporary Working Area, including the year of construction, based on the commodity cost, discount rate and loss schedule as shown on the attached Schedule "C".

COVER CROP PROGRAM

It is sometimes appropriate in pipeline construction to plant a cover crop of legumes or any other crop that will facilitate better access by vehicles at the time of construction, that will help to reduce compaction and that will help the Contractor keep the topsoil piled separate from the undisturbed topsoil.

If, prior to construction, the Landowner and the Company agree that a cover crop is required, they will establish a mutually satisfactory cover crop program that should consider such items as planting the cover crop in the spring of the year of construction and leaving it, or if damaged, replanting after construction, to aid in the restoration of the land.

If requested by the Company, the Landowner shall maintain the cover crop for the year following construction, and the Company shall compensate the Landowner for loss of crop production based on the acreage of the cover crop multiplied by the gross per acre value of the abutting crop, less any revenues received by the Landowner, or the Landowner's tenant, from the harvesting of the cover crop.

WOODLOTS

Where required, the Company will retain a mutually satisfactory qualified forester, ("the Forester"), to appraise all woodlots and hedgerow trees to be cut to determine their value. The forester should contact the Landowner before entry on the property. Copies

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of appraisal reports will be made available to affected Landowners and payment will be made in accordance with the reports. Evaluation of trees will be based on the accepted practice of considering only those trees with a minimum diameter of 100 mm (4") or greater, measured at breast height (merchantable timber).

Prior to commencement of pipeline construction, the Landowner may request that any tree to be removed from the Landowner's property be evaluated for aesthetic purposes. In that event, the Company will contract a qualified person to complete an evaluation of the tree based on commonly accepted practices and principles and the Company would pay the Landowner the evaluated price for the tree(s). If trees are less than 12.70 cm. (5 inches) in diameter, replacement of the trees may be considered in lieu of a payment.

All logs and firewood will be piled at a location mutually agreeable between the Company and the Landowner. All merchantable timber will remain the property of the Landowner and will be cut in approximately 2.4 m (8 ft) lengths.

The Company will enter into an agreement as Owner with the County of Lambton to replace trees at 2 for 1 based on the acreage of trees which are cleared from the Work Area. The Company will comply with the terms of the agreement and perform the obligations of the Owner set out therein.

If, due to the location of the trees, or for other reasons, it is not possible or practical or if it is too disruptive for the Company to perform the obligations of the Owner, the Company will offer to enter into an agreement with the Landowner to perform said obligations.

Where possible and approved by the Landowner, tree seedlings will be planted within the Temporary Working Area or elsewhere on the Landowner's property. The Company will seek the services of a qualified party, such as the Forester, or a representative of the Ministry of Natural Resources, to consult with the Landowner and make recommendations as to species to be planted.

Replanting will be done in accordance with the Company's policies regarding tree planting on easements, so that a seven (7) metre strip centred on the pipeline is left open for future access to the pipeline.

TRAPPED LANDS

In any year that trapped lands are not able to be farmed, the Landowner will be compensated by the company the equivalent of one year crop loss for any agricultural land off the Work Area which has become inaccessible or "trapped" due to the construction activity.

The Company and the Landowner will identify all trapped lands and determine a care and management program for these lands for the time period that they cannot be

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farmed. The Company shall pay all practical additional expenses that are a direct result of not being able to farm the trapped lands, such as weed control. As part of this program it may be desirable that the Company reach an agreement with the Landowner to provide some or all of the services required by the program.

LIABILITY

The Company will be responsible for reasonable damages to property, equipment and loss of time resulting from construction operations, and will pay for reasonable repairs or replacement costs, provided that the damage is not a result of careless or negligent activities of the Landowner or other party claiming for the damage, or a third party.

The Company will be responsible for any violation it directly causes of any law, and for any reasonable damage to person or property it directly causes, now or in the future and it shall indemnify the Landowner from and against all loss, damage, injury or expense as a result of the operations of the Company.

GENERAL MATTERS FOR DAMAGES

Damage payments shall be made directly to the registered Landowner, or at the Landowner's option, to his/her tenant, for any matters, including the damages to the Landowners'/tenants' farm equipment. The Company will negotiate with the Landowner, or the tenant, as the case may be, for the reasonable compensation for any repairs and associated costs, upon notification and proper supporting documentation.

PIPELINE OPERATIONS AND MAINTENANCE

The Company will require access to the Easement from time to time to conduct routine maintenance activities and also non-routine activities, such as investigative digs. For this, and other purposes, the following clause is contained within the Transfer of Easement Agreement "This Transfer of Easement shall include the right of the Transferee, its successors, assigns, servants and agents to use the surface of the Easement Lands for ingress and egress on foot and/or with vehicles, supplies, machinery and equipment at any time and from time to time".

It is understood by the Company and the Landowner that the above clause is necessary to allow the Company to conduct operational activities on the pipeline as required, but does not give the Company the right to conduct operations and/or travel on the Easement lands with vehicles and equipment in an irresponsible manner.

The Company will confine routine activities to the Easement, and will schedule the work to accommodate crop planting, growing and harvesting and weather conditions, and will not use vehicles or equipment for these purposes without the Landowner's prior written consent. In the event that routine activities are conducted outside of the farming season, the Company shall negotiate crop and other related damage settlements with

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the affected Landowner.

The Company and the Landowner agree that in the event additional lands off of the Easement lands are required for non-routine maintenance activities, such as investigative digs, and require the use of equipment, that they will reach a mutually satisfactory agreement as to the location of such lands and that compensation for such activities shall be as set out in the Company's investigative dig compensation procedure attached hereto as Schedule "D". (Removed for Confidentiality Reasons) Unless work is of an urgent nature, this type of work will typically be conducted in, but not limited to, the period between May 15th and October 31st of any year.

In the event that an investigative dig is performed, the construction and restoration requirements and processes set out in this LOU shall apply to the operations related to the investigative dig.

Prior to excavation for scheduled maintenance or repair work, the topsoil should be stripped and piled separately from the subsoil.

When the pipeline is permanently taken out of service, the Company undertakes to implement proper decommissioning techniques, in accordance with the requirements of the current Ontario Regulation O. Reg 210/01 Oil and Gas Pipeline System code (CSA Z662), or such other regulation presiding at that time.

In the event the pipeline is permanently decommissioned and abandoned and yet remains in place, the Company will take all reasonable actions to remove any sections of the pipeline to facilitate reasonable land use circumstances which may arise from time to time.

Yours truly,
Enbridge Gas Distribution Inc.

Terry Chupa C.I.M.
Land Agent/Land Contracts Manager

Dated at _____ this ____ day of _____, 2007.

Witness: _____
Terry Chupa

SCHEDULE "A"

WET SOIL SHUT DOWN PROCEDURE

This procedure applies to the Project and will be supervised by the Company.

The objective of this procedure is to conserve and protect topsoil in agricultural areas from long-term damage and consequential crop losses. Movement of heavy construction equipment on the Working Area during wet soil conditions may cause excessive compaction and rutting.

This procedure is in place to suspend or minimize construction activity during these periods and shall remain in effect over the entire construction and clean-up periods. In some special situations, other wet soil operating procedures may be employed, subject to the approval of the Landowner.

1. The Company will meet with the Landowner Representative for the purpose of determining and enforcing a Wet Soil Shut Down ("WSSD").
2. When conditions indicate that it may be necessary to invoke a WSSD, the Project Manager and the Landowner Representative will assess the right-of-way soil conditions at least 30 minutes before construction is scheduled to commence.
3. When a WSSD is invoked, the Project Manager will immediately notify the Contractor of a WSSD. The Project Manager will ensure that the Contractor has promptly ceased all of the affected construction activity.
4. A partial WSSD may be declared, if the Landowner Representative and the Project Manager are of the opinion that certain activities can continue in certain work areas without causing soil damage. This may include restricting movement on the right-of-way to wide tracked equipment, bored crossings, welding etc. The approval of the Landowner Representative will be necessary to invoke a partial WSSD.
5. In a work day where rain commences after construction has started, the Landowner Representative and the Project Manager will keep a close watch on the soil conditions and will assess if and when a WSSD should be called.
6. The Company confirms that the agreement between the Company and the Contractor contains provisions to compensate the Contractor for WSSD's and to penalize the Pipeline Installation Contractor if non-approved work is performed during a WSSD.