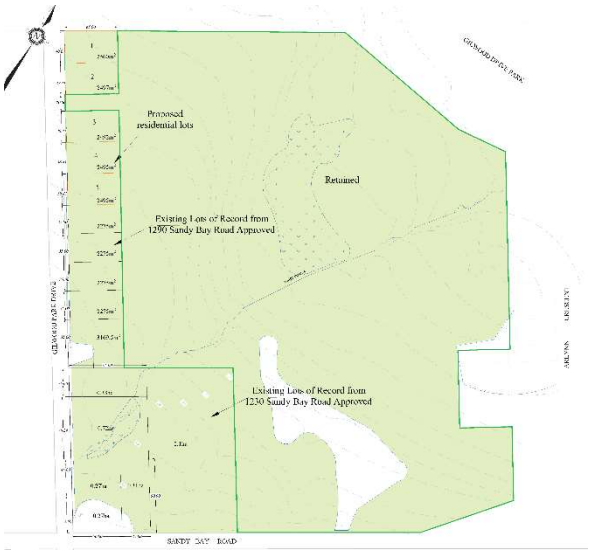
1290 Sandy Bay Road

Town of Penetanguishene

Functional Servicing Design Brief



August 2024

File: 2403

KARDIN GROUP

TORONTO, ON
M4E 2R3

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1.0 INTRODUCTION

1.1 Introduction

This Functional Servicing Design Brief has been prepared in support of the proposed five residential lot severance application, from an original 26.5 hectare property, located on the east side of Gilwood Park Drive, in Lots 14 and 15, Concession 3 of the Geographic Township of Tay, now in the Town of Penetanguishene.

1.2 Background Reports

Details from the following reports have been incorporated into this report.

- Preliminary Hydrogeologic and Servicing Concepts Assessment, Azimuth Environmental Consulting Inc., May 2003
- Functional Servicing Report, Gilwood Bay Development, R.G. Robinson and Associates (Barrie) Ltd., Aug 2003
- Environmental Impact Study – Gilwood Property, Neil Morris, Consulting Ecologist, 29 Aug 2024

In preparation of this report the Town of Penetanguishene Specifications for design have been incorporated.

1.3 Site and Environmental Description

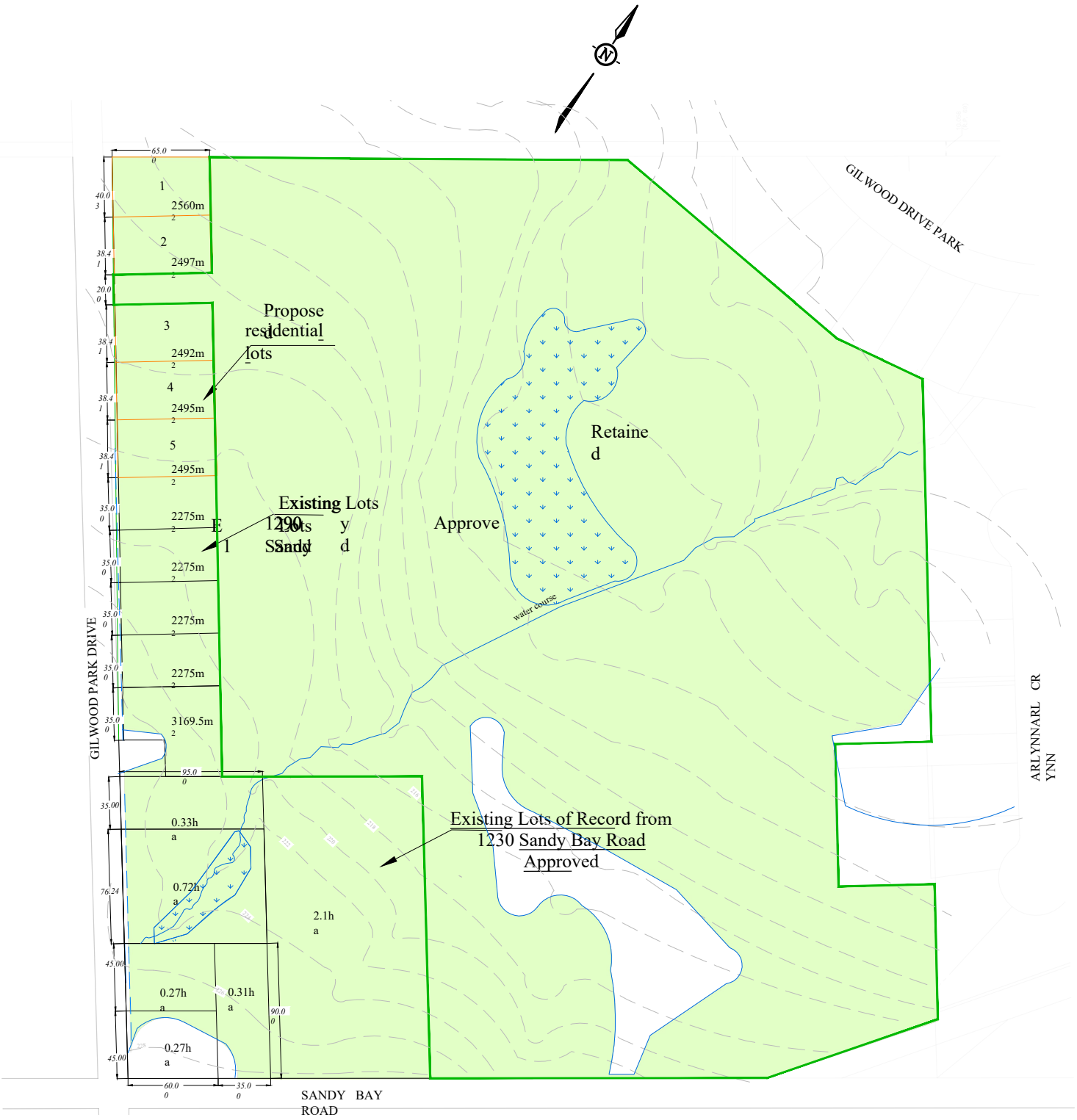
This Report will specifically address the area of proposed severance of five residential lots, as noted on **Figure 1**. Note these five lots are to the north of previously severed and approved lots.

The proposed Lot 1 is 40m wide, and Lots 2 to 5 are 38.41m wide by 65m deep. A 20m wide future ROW has been retained between proposed Lots 2 and 3 to access potential future development in the remainder of the retained lands.

Vegetation on the lots consists of mixed deciduous trees. Topography of the lots is sloping down to the north, slopes varying from 6% to 4%, with an overall slope of approximately 4%. Lot 5 is located at the higher, south end of the site, sloping down to the north.

Soils within the larger 26.5ha site, as described in the Preliminary Hydrological Report, are composed of mixed sands, glacial till, stones, gravel and boulders, up to approximately 40m in thickness. Discontinuous seams of fine grain materials create localized perching of the water table. This creates localized areas of groundwater discharge within the site. Limestone is present at approximately 60m.

The Simcoe County Soils Map indicates site soils are comprised of Tioga series, sandy loam. A soils investigation, utilizing test pits, was carried out to evaluate the impact of septic systems. The investigation indicated that the surface soils are variable throughout the site ranging from coarse grained sands to finer materials. In most areas of the site the groundwater table is relatively close to the surface.



From: Goodried Planning Group

Gilwood Severences- 1290 Sandy Bay Road
Design Brief

Location Plan

FIGURE 1

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Aug 29, 2024

Not to Scale

The soils investigation located two test pits, TP-1 at approximately at the rear of Lot 3 and TP-2 is approximately 60m behind Lot 2. Soils in this location consist of coarse sand, with a water table approximately 0.8m below the surface at TP-1 and 0.4m at TP-2. It is noted that the average elevation of Lots 1 and 2 are 2m to 4m higher than the locations of these test pit locations, and the soils are sandy to depth, the water table is expected to be lower at the building and septic locations.

Test Pit locations and Test Pit Logs from the Preliminary Hydrogeologic and Servicing Concepts Assessment are included in **Appendix 1**.

2.0 SANITARY SERVICING

Sanitary servicing will be through the use of individual Class 4 septic systems. The recommended configuration is a filter bed or raised filter bed depending on goundwater elevation.

Septic systems are expected to be raised above existing ground due to high water elevations noted in the Preliminary Hydrogeologic Report. However it is noted that the centre elevation of Lots 1 and 2 are at least 2m higher than the Test Pit location and the elevation of Lots 3 to 5 is 4m to 6m higher. Given the coarse sandy nature of the subsurface soils, the groundwater table may be deeper below the surface, enabling the use of an in-ground, or partially in-ground system.

For the purposes of this design brief, a large house has been assumed, with a daily design flow of 3000 L/day. This equates to a house of up to approximately 3,000 sq ft, with 4 bedrooms and 4 bathrooms.

The soil described in TP-1 is coarse sand, and the Hydrogeological Investigation suggested septic design based on a Percolation Rate (T) of 25 min/cm. However the percolation rate for coarse sand will be much quicker. Based on the description of the soil in TP-1, the actual Percolation Rate is expected to be quicker when tested. The Percolation Rate of 25 min/cm will be used in the functional calculations as a worst case for functional servicing design purposes.

Percolation Rate (T time) = 25 min/cm

Daily Design Flow Rate = 3000 L/day

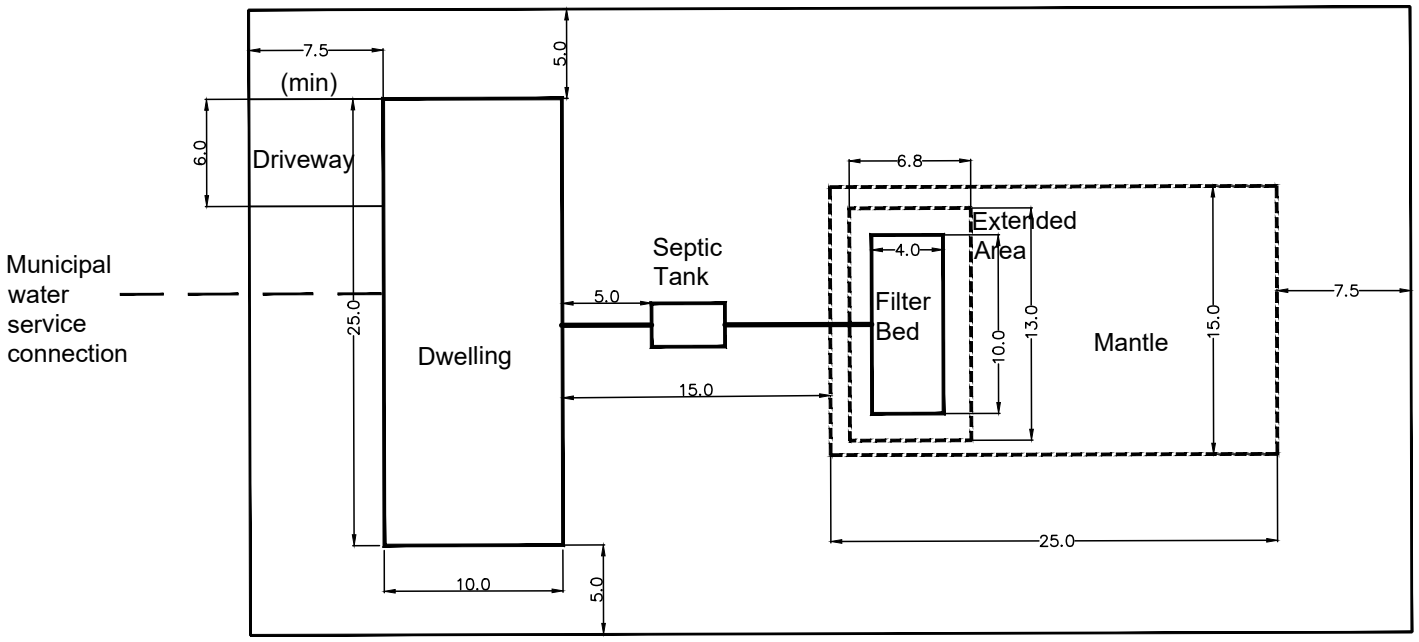
Filter Bed Area = 40 m^2

Filter Extended Area (includes Filter Bed) = 88 m^2

Mantle Area (including Extended Area) = 375 m^2

Mantle Area (excluding Extended Area) = 287 m^2

A sample configuration of this layout on a lot is shown in **Figure 2**. The assumptions are Filter Bed dimensions of 4m x 10m, with a 0.25m thick Extended Area of 6.8m x 13m and a 0.25m thick Mantle (including Filter and Extended areas) of 15m x 25m. The size of Mantle is the potential footprint of the septic bed system. Note that that configuration could be made slightly wider to



Gilwood Severences- 1290 Sandy Bay Road
Design Brief

Typical Septic Bed Layout

FIGURE 2

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AUG 29, 2024

Not to Scale

reduce the depth. However a minimum mantle of 15m downgradient of the last distribution pipe is required. The layout in the figure assumes a raised bed, 1m above existing grade, with 4:1 slopes down to existing grade.

Clearance distances to the septic system as follows.

Piping Clearance to	– Dwelling	5m
	– Property Line	3m

If the existing sand at the septic bed location has a Percolation Time (T time) of 15 min/cm or less, a mantle is not required. However the overall configuration and depth to groundwater is to be taken into account.

In summary, the lots will be serviced by individual septic systems, consisting of filter beds, meeting Ontario Building Code. High water conditions identified in the Hydrogeological Report indicate partially or fully raised beds may be necessary on some lots. Design of the individual septic systems will occur at the Building Permit stage for the individual site plans.

3.0 DOMESTIC WATER SERVICING

Domestic water supply would be from individual services fed by the existing 150mm diameter municipal watermain running along the west side of Gilwood Park Drive.

Because of the distances and possible setback of residences on deep lots, in addition to larger residences, a minimum 25mm water service is recommended. This would be sufficient for a residence with a fixture count of up to 31 fixture units.

At the time of construction of the houses, the number of fixtures along with the total length of the service to the house, should be reviewed to ensure there is adequate supply.

4.0 STORM DRAINAGE

Runoff from the proposed 5 lots after construction will continue to be overland flow down gradient to the northeast. There are no defined channels or concentrated flow paths near the proposed lots.

4.1 Proposed Storm Drainage System

Stormwater runoff from of the roadway follows the roadside ditch to the north and does not enter the lots. As the lots slope down away from the road, drainage from the lots does not enter the roadside ditch.

No stormwater management controls are proposed. Since the lots are very large, the percentage impervious area on each lot is expected to be less than 15%. There will not be any directly connected impervious areas to a discharge point. Impervious areas will all discharge to pervious areas and are conveyed by sheet flow. The coarse sand soils of the lots and in the area downgradient of the proposed lots, will infiltrate surplus runoff from impervious areas from typical rainfall events. Little to no runoff is expected for typical annual storm events.

A portion of Lot 1 will drain overland toward existing lots to the north. Rainwater from roofs can be directed to soakaway pits if necessary, depending on impervious area at the building permit stage.

Because of the pervious nature of the soil, limited impervious area, discharge as sheet flow across vegetated will create little to no runoff for typical annual storm events. Additional treatment of runoff is not necessary. As the existing area of the lots is fully treed, creation of any type of surface storage or infiltration swale across the rear of the lots would require removal of trees, and would potentially create point discharge for runoff instead of sheet flow, as such it is not recommended.

4.2 Erosion Sediment Control

Development the individual lots will minimize tree clearing. Only a portion of the lots sufficient for house and septic system construction will be cleared.

The type of erosion and sediment control will generally consist of temporary silt fencing to capture runoff draining as sheet flow and serve to protect existing trees on the lots. The location and sizing of sediment control fencing is to be shown on Site Plan Drawings.

5.0 WATER BALANCE

The local water balance of the proposed lots and area down gradient of the lots will not be affected. The impervious areas are limited to less than 15% of the lot area, and all discharge from impervious area is to pervious areas is by sheet flow with no channelized, piped or impervious conveyance from the site. Soils in the area are sandy, contributing to infiltration potential of runoff from impervious areas. Domestic water supply is from a municipal source, domestic wastewater is discharged to individual, on site septic systems, slightly contributing to local groundwater. Given the coarse sandy nature of the underlying soils, no impact on groundwater is expected.

6.0 GRADING AND ROADWAY

The lots front Gillwood Park Dr., a paved road with municipal ditches on each side. The road slopes down to the north, with a longitudinal slope 0.8% in front of Lots 1 to 3, and approximately 2% in front of Lots 4 and 5. Traffic sight distances from driveways and the proposed intersection are greater than 200m, exceeding requirements for the posted 60 km/h speed limit.

As the elevation of the lots tend to be below the roadway and sloping away from the road, the elevation at the front of the front of the lots may need to be raised to define the roadside ditch. This will be detailed at the Site Plan stage.

7.0 CONCLUSIONS

This Functional Design Brief documents the sanitary servicing, domestic water supply, stormwater and grading recommendations for this severance.

The proposed servicing for the 5 residential lot severance satisfies requirements of the appropriate authorities, and will not have a detrimental impact to surrounding properties.
All of which is respectfully submitted,

Kardin Group

K. A. Bobechko, P.Eng.

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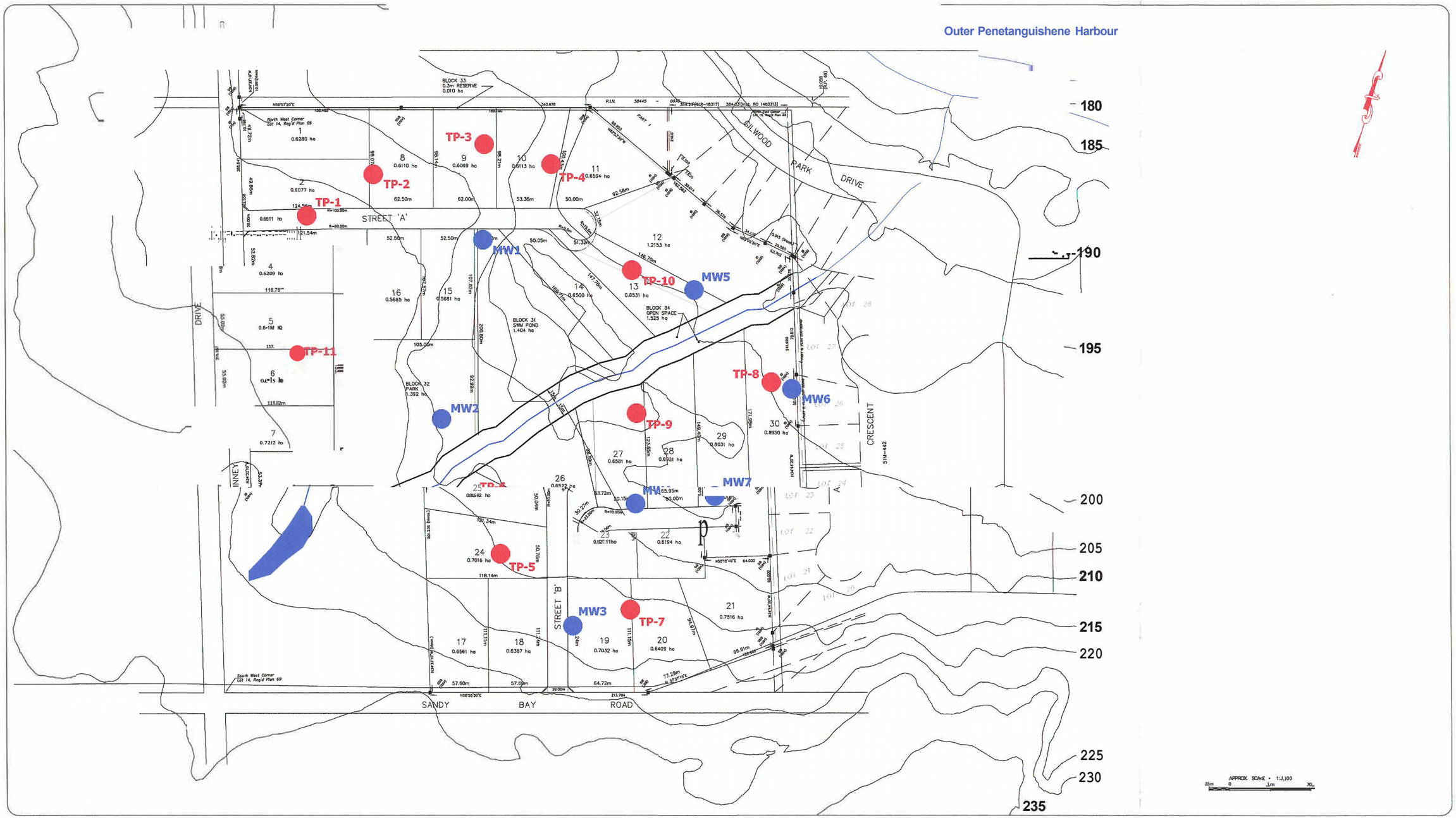
APPENDIX 1

TEST PIT LOCATIONS AND LOGS

From

Preliminary Hydrogeologic and Servicing Concepts Assessment,
Azimuth Environmental Consulting Inc., May 2003

Outer Penetanguishene Harbour



Legend:

- Test Pit Location (AEC, April 2003)
- Existing Ground Water Monitor (Unknown instollotion date)

Base Figure: R.G.R. #DP-1

I/T H ENVIRONMENTAL CONSULTING, INC.

Monitoring Locations

Date Issued:	May 2003
Created By:	JAM
Project No.	02-184
File Name:	FIGURE2.DWG

Gilwood Subdivision, Phase IV
Hydrogeological Evaluation
Penetanguishene, Ontario

Figure No. 2

APPENDIXB

TEST PIT LOGS

Date: April 25, 2003
Weather: Partly Sunny, 7° C

Attendance: Jason Murchison - Azimuth Environmental Consulting, Inc.
Mills Excavating Ltd.

Method of Examination: test pits were excavated at four locations with a rubber-tired backhoe. Each test pit was visually logged during the site visit, and soil samples were re-examined in the office. The work program on this day was terminated prematurely due to a flat rear tire on the backhoe.

All measurements are in metres below ground surface (bgs).

Test Pit #1

, 0.0 - 0.2 m Topsoil
dark brown to black, organics, sandy, rootlets, loose, slightly moist.

0.2 - 0.8 m Sand
reddish brown, coarse sand, trace silt and gravel, organics present in upper 0.2 m, oxidized, loose, dry until about 0.6 m when material becomes saturated, no structure, well sorted.

0.8 - 1.0 m Sand
reddish brown, very coarse s d, with gravel and cobbles, no organics, .loose, saturated, no structure, well sorted.

- heavy ground water seepage encountered at ~0.8 m bgs
- excavation terminated at 1.0 m bgs due to caving and pooling of ground water within excavation
- samples obtained at 0.5 and 0.9 m bgs.

Test Pit #2

0.0 - 0.35 m Topsoil
dark brown to black, organics, sandy, loose, slightly moist.

0.35 - 0.5 m Sand
reddish brown, coarse sand and gravel, trace silt, no organics, oxidized, loose, saturated, no structure, well sorted.

0.5 - 2.6 m Sand
reddish brown, medium to fine sand, some gravel, trace silt, occasional cobbles, and boulders, no organics, oxidized, loose, slightly moist, no structure, poorly sorted.

becoming grey, more compact and saturated at ~1.5 m bgs.

- heavy ground water seepage encountered at ~0.4 m bgs
- excavation terminated at 2.6 m bgs due to caving and pooling of ground water within excavation
- samples obtained at 0.8 and 1.75 m bgs.

Test Pit #3

0.0 - 0.4 m Topsoil
dark brown to black, organics, sandy, loose, slightly moist.

0.4 - 1.5 m Sand
reddish brown, medium sand, some gravel, trace silt, occasional cobbles and boulders, no organics, oxidized, loose, wet, no structure, poorly sorted.

1.5 - 2.4 m Sand
reddish brown, fine sand, some gravel, trace silt, occasional cobbles and boulders, no organics, oxidized, becoming increasingly drier and only slightly moist at depth, no structure, poorly sorted.

- heavy ground water seepage encountered at ~0.4m bgs
- excavation terminated at 2.4 m bgs due to caving and pooling of ground water within excavation
- samples obtained at 0.6 and 2.0 m bgs.

- moderate ground water seepage observed at ~1.85 m bgs
- excavation terminated at 2.7 m bgs due to caving and pooling of ground water within excavation
- samples obtained at 0.5 and 2.0 m bgs.

Test Pit #10

0.0 - 0.25 m Topsoil
dark brown to black, organics, sandy, loose, slightly moist.

0.25 – 2.2 m Sand
reddish brown, medium to fine sand, trace silt and clay, no organics, oxidized, loose, moist, no structure, poorly sorted.

becomes grey and saturated at about 0.65 m bgs.

2.2 – 3.0 m Silty Clay
grey, silty clay, trace fine sand, highly plastic, no organics, firm to stiff, moist, good cast and ribbon (>10cm), no structure.

- slight ground water seepage observed over time at about 1.0 and 1.5 m bgs
- excavation terminated at 3.0 m bgs due to caving and ground water pooling within pit
- samples obtained at 1.5 and 2.5 m bgs

Test Pit #11

0.0 - 0.3 m Topsoil
dark brown to black, organics, sandy, loose, slightly moist.

0.3 - 2.0 m Sand
light brown, fine sand, trace silt, no organics, oxidized, compact, blocky, moist, no structure, well sorted.

becomes saturated at ~0.5 m bgs, grey at about 1.25 m bgs, occasional clay nodules beginning at about 2 m bgs.

- moderate ground water seepage observed at about 0.5 m bgs
- excavation terminated at 2.4 m bgs due to caving and ground water pooling within excavation
- samples obtained at 1.3 and 2.1 m bgs