ASSOCIATION OF ONTARIO LAND SURVEYORS
INTERPRETIVE GUIDE FOR INTEGRATED SURVEYS, VERSION 1.01
SUPPLEMENT TO :

ONTARIO REGULATION 216/10
filed under the
SURVEYORS ACT on the 7th day of June, 2010
PERFORMANCE STANDARDS FOR THE PRACTICE OF PROFESSIONAL LAND SURVEYING

Abstract:

This regulation sets the standard of care for surveyors to follow when integrating surveys. The Land Title system does not guarantee the extent of title. Similarly, integrated coordinates are not guaranteed positions for the public to use. Accurate georeferencing helps professional land surveyors to discharge their duty to the public.

There will always be differences of opinion and discrepancies to resolve between what is in the record and evidence on the ground. These differences can far exceed the accuracy to which surveyors are capable of measuring. The resolution of contradictory boundary evidence is the essence of professional cadastral surveying.

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Part I
General

Definitions

1. In this Regulation,

"coordinates" means an ordered set of numbers designating the position of a point in space; ("coordonnées")

the coordinates shall be expressed as grid coordinates as set out in Section 31. (b).

"coordinate system" means a spatial reference system in which coordinates are related to the earth by a known reference datum; ("système de coordonnées")

Sections 31(a) and (b) list the permitted datums and map projections; in particular, the datum must be NAD83(Original) or NAD83(CSRS+epoch) and the projections must be UTM or MTM.

"monument" includes any monument described in Ontario Regulation 525/91 (Monuments) made under the Act and any other thing, device or object used to mark or witness a boundary of surveyed lands or to mark a specified control point or observed reference point; ("borne")

In addition to legal survey points, control points are also monuments.

"observed reference point" means a monument connected to a coordinate system by measurements; ("point de référence observé")

The survey must be connected to monumented control, per Section 18 (1) (i) (v). There will be times when the surveyor will want to create one or more new monumented control points. The following methods are available for creating an "observed reference point" connected to a coordinate system. They include, but are not limited to:

Ties with conventional total stations to specified control points;

(For conventional total station methods see the AOLS <u>Guidelines for Surveys</u> dated 1984-07);

Ties with two or more Global Navigation Satellite System (GNSS) receivers to specified control points including:

Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase differential vectors to "specified control points"; (for GNSS methods see the AOLS <u>GPS Draft Guidelines</u> dated 2002-02);

Precise Point Positioning with two or more GNSS receivers:

When using GNSS receivers, the surveyor can observe coordinates using the NRCan PPP service, and simultaneously observe phase differential vectors between the PPP stations.

These vectors created from processing simultaneous observations between two or more PPP stations will provide very accurate bearings and distances to check the validity of the less accurate inverses between the coordinates of the stations obtained using the PPP service. To obtain final coordinates for the table in

Section 18.(1)(i)(i), one position will be held fixed and the others will be computed from the vectors.

(for PPP methods see the NRCan publication: "On-line Precise Point Positioning 'How to Use'" dated 2004-04);

Observations with one GNSS receiver, including:

Precise Point Positioning; and

Positioning with a single rover in a commercial RTK network (GNSS precision wide area network).

When using a single GNSS receiver, it is mandatory to have redundant measurements, separated by a sufficient time period to collect adequate data in order to satisfy the accuracy for the area you are working in.

Integration using only one GNSS receiver also requires current independent testing of the equipment and process over a specified control point, preferably in the general vicinity of the survey, as part of the field documentation.

"specified control point" means a monument with coordinate values that are of record with and are stored and made available by a control survey authority, such as a federal or provincial agency, or by a municipality; ("point de canevas précisé")

Integrated surveys must be connected to monumented control, per Section 18 (1) (i) (v), with sufficient data to enable the location of the parcel of land surveyed to be ascertained in relation to the monumented points that are used to integrate the survey.

There are many methods for connecting an integrated survey to "specified control points", including:

Ties with conventional total stations;

(For conventional total station methods see the AOLS Guidelines for Surveys dated 1984-07);

Ties with two or more GNSS receivers including:

Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase differential vectors; (for GNSS methods see the AOLS GPS Draft Guidelines dated 2002-02);

Standards for projects

2. When undertaking a project, a professional member shall ensure that the project meets all project requirements and specifications and that it complies with this Regulation.

This Regulation gives minimum standards. Certain projects may require higher standards, and therefore the standard of care should be elevated appropriately.

Quality assurance

Measurements and calculations for integrating cadastral surveys shall be proven by independent redundant checks. Positioning methods using a single GNSS receiver require a reasonable time interval before making redundant checks to allow for the geometry of the satellites to change.

PART II
CADASTRAL SURVEYING

9. Error of closure of field data on a survey, in respect of the perimeter of each parcel of land or closed traverse, shall not exceed,

(a) for the first 30 metres of perimeter, an error of 30 millimetres;

(b) for the next 300 metres in excess of 30 metres of perimeter, an error of 6 millimetres per 30 metres;

(c) for the next 240 metres in excess of 330 metres of perimeter, an error of 3 millimetres per 30 metres; and

(d) for a total perimeter of more than 570 metres, an error of one part in 5,000.

It is useful and instructive to conduct integrated surveys in a least-squares environment to obtain detailed reporting on accuracy and confidence levels. One goal of good surveying is to remove constant errors, systematic errors and blunders. Integration with least squares will help detect and remove these problems.

When using least-squares, error ellipses help determine where the network is weak because of measurements or geometry.

Bearings

10. Bearings on a survey shall be...
If a survey has been integrated with a coordinate system in accordance with section 14, all bearings will be shown as Grid Bearings and a note shall be included on the plan indicating that the bearings are Grid Bearings, referenced to the stated projection, zone, datum and if applicable, adjustment epoch .
Bearings may be quadrantal or full-circle.

(a) determined from astronomic, gyroscopic or Global Navigation Satellite System observations;

The surveyor's goal is to determine bearings to meet the accuracy requirements of the survey. (Note: a distance error of 1:5000 per Section 9(d) equates to a bearing error of about 40”).

Special techniques to obtain good bearings for integrated surveys include:

1. Astronomic or gyroscopic observations (with Laplace transform if applicable) plus convergence to grid;

2. Observations with two or more GNSS receivers including:

Static, Rapid Static or Real Time Kinematic (RTK) simultaneous phase differential vectors;

The minimum baseline distance between GNSS receivers should be 150m;

3. Observations with one GNSS receiver, including:

(a) A single GNSS receiver for Precise Point Positioning;

Processing observations obtained at different times results in independent positions. The accuracy of an inverse between the two points will be limited by the accuracy of both PPP solutions. Using a single GNSS receiver and PPP to determine bearings may not be adequate, but the error could be mitigated by longer observation times on longer baselines.

(b) A single GNSS receiver in a commercial RTK network (GNSS precision wide area network).

When using a single GNSS receiver, it is mandatory to have redundant measurements, separated by a sufficient time period to collect adequate data in order to satisfy the accuracy requirements of the survey.

Introducing a third monumented point and proving the angle with a direct total station observation or traverse is advised to test whether the bearing is adequate.

(b) derived from a line of known bearing if survey evidence of the line exists on the ground and the position of the line is described on the plan being prepared; or

Grid bearings derived from a line in a previous survey may meet the requirements of integration even if that survey predated this Regulation provided:
The previous survey is well connected to "specified control points"; and
The datum and projection of the previous survey can be reliably converted to NAD83(Original) or NAD83(CSRS+epoch) and its projection to UTM or MTM.

(c) derived from monuments in a coordinate system.

Monuments in a coordinate system include “specified control points” and “observed reference points”.

Boundary monuments from a previous survey may qualify as "observed reference points" provided:
The previous survey is well connected to "specified control points"; and
The datum and projection of the previous survey can be reliably converted to NAD83(Original) or NAD83(CSRS+epoch) and its projection to UTM or MTM.

14. Integration

(1) When undertaking a survey for a plan to be registered or deposited in the registry system or land titles system, a licensed member shall integrate the survey with a coordinate system in accordance with sections 31 to 35 and determine the coordinates of every angle or corner on a line or boundary and all topographic information required under section 24.

(2) The coordinates required under subsection (1) shall be accurate, at the 95 per cent confidence level, to,

(a) 0.05 metres in urban areas;

(b) 0.2 metres in rural areas; or

(c) one metre in remote areas.

Factors to consider when assessing whether an area is urban, rural or remote:

An area is urban if "built-up" or if there is a "specified control point" within 2 kilometres of the survey;

An area is rural if there is a "specified control point" between 2 kilometres and 15 kilometres from the survey;

An area is remote if there is no "specified control point" within 15 kilometres of the survey.

When remote or rural land is being developed, surveyors should consider whether the area is becoming rural or urban.

Registered plans should usually be treated as "urban".

Confidence Level:

Accuracy of the listed coordinates shall be to the 95% confidence level. PPP accuracies are 68% and must be grossed up to 95% by multiplying the error by 2.0.

Accuracy:

The regulation was intentionally silent on whether the accuracy standards were referring to "absolute (network) accuracy" or "relative (local)" accuracy. Although in the longer term surveyors will likely strive to meet "absolute (network) accuracy" for now most surveys will be striving to meet accuracy standards associated with "relative (local)" accuracy. This is particularly true where surveyors are integrating using existing control that in itself may not meet urban standards of "absolute (network)" accuracy.

By tying "observed reference points" from previous integrated surveys, the new

survey accuracy is limited by the accuracy of the previous points, be they classified as urban, rural or remote.

Only the coordinates explicitly listed in the table are required to meet the accuracy standards of urban, rural or remote.

(For network and local accuracy (absolute and relative accuracy) see the NRCan Accuracy Standards for Positioning Version 1.0 dated 1996-09);

Plans
Contents

18. (1) A plan shall show,

(a) if a survey has been integrated with a coordinate system in accordance with section 14,

(i) a table containing the coordinates of at least two monumented points related to the survey;

Plans should normally show three monumented points, per generally accepted verification of monuments.

(ii) a note stating that the coordinates cannot, in themselves, be used to re-establish the corners or boundaries shown on the plan,

This section does not negate the use of a coordinate when it is the best evidence available. The phrase "in themselves" means that the coordinate is not used in isolation without the normal documentary and field research and application of the statute and common law. Additionally, this clause requires that a surveyor make independent checks when staking a point at a coordinate.

(iii) a note stating that the coordinates comply with subsection 14 (2),

The confidence level (urban, rural or remote) should be in the table where the coordinates are listed.

(iv) a note stating the source from which the coordinates were derived and specifying the map projection, zone, datum and if applicable, adjustment epoch, and

The datums and map projections permitted are listed in Sections 31 (a) and (b); the datums being: NAD83(Original) and NAD83(CSRS+epoch), and the projections being UTM and MTM.

(v) sufficient data to enable the location of the parcel of land surveyed to be ascertained in relation to the monumented points that are used to integrate the survey and that are shown in the table described in subclause (i);

The intention of this section is to require the surveyor to show ties from monuments on the boundary of the survey to at least two control monuments, be they "specified control points" or "observed reference points".

The ties should be chosen to provide sufficient data to permit the calculation of the error of closure from a starting control monument, through the plan dimensions, to an ending monument, thereby proving the soundness of the connection to the reference system.

Sometimes the boundary monuments and the control monuments may one in the same.

19. (3) If a survey has been integrated with a coordinate system in accordance with section 14, a note shall be included on the plan to indicate that the distances shown on the plan,

(a) are ground and can be converted to grid by multiplying by the stated combined scale factor; or

(b) are grid and can be converted to ground by dividing by the stated combined scale factor.

20. Bearings

(3) If bearings have been derived from survey evidence of a line of known bearing, a note shall be included on the plan,

(a) indicating the source of the bearings, the specified limit from which they are derived and the stated bearing; and

(b) describing the evidence used to re-establish the line.

(4) If bearings have been derived from specified control points or observed reference points, a note shall be included on the plan indicating that the bearings are grid bearings and are referred to the stated map projection, zone, datum and if applicable adjustment epoch.

Grid Bearings for integrated surveys may be derived from a specified limit or from coordinates.

Location information

21. (1) By the use of light, broken or unbroken, lines of uniform width, a plan shall clearly and accurately show,

(b) sufficient data to enable the location of the parcel of land surveyed to be ascertained in relation to the limits of the lot of which it is a part;

Integrated surveys still require a lot corner tie.

Comparison information

23. If a measurement of distance or direction to be shown on a plan differs from that shown on a previously registered or deposited plan or contained in a description in a previously registered instrument or parcel, the plan shall show,

Since all integrated surveys have grid bearings and many existing surveys use

astronomic bearings, for the purposes of bearing comparisons a note may be included to indicate that the bearings on previous plans have been rotated to grid bearings. This note may be shown in a table to refer to multiple plans.

Rotation Note:
For bearing comparisons, a rotation of dd°mm'ss" (clockwise or counter clockwise) was applied to (identify plan) to convert to grid bearings.

Coordinate Comparison
Owing to incremental improvement in equipment and the surveyor's skill, accuracy is likely to improve with time. For these and other reasons, such as the recovery of superior monuments or adopting a newer datum epoch, a surveyor may have occasion to show comparisons to previous coordinates. This can be accomplished in the coordinate table or through a separate note.

28. Surveyor's Real Property Report

It is not mandatory to integrate an SRPR.

PART VII
COMMENCEMENT

43. This Regulation comes into force on the day it is filed.

It is not mandatory to integrate surveys pursuant to Section 14 if they were started prior to the filing of the Performance standards

Sample Integration Statements under O.Reg. 216/10

DISTANCE NOTES

METRIC CONVERSION

19.(2) CALLS FOR THE METRIC CONVERSION NOTE.

AND COORDINATES PER 19. (2)

OR, TO METRES BY MULTIPLYING BY 0.3048 PER 19(2)(b)

IN METRES, OR IN FEET PER 19(1)

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

PER 19(2)(a)

GRID SCALE CONVERSION

19.(3) CALLS FOR THE COMBINED SCALE FACTOR.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

OR, DIVIDING PER 19 (3) (b)

BEARING NOTE

20.(1) CALLS FOR THE ORIGIN OF THE BEARINGS

ALL INTEGRATED SURVEYS WILL SHOW GRID BEARINGS DERIVED FROM:
10.(a), 20.(2): OBSERVATIONS (CITE BEARING OF DIRECT TIE FROM A TO B)
- –ASTRONOMIC OBSERVATION FROM STATION A TO STATION B PLUS CONVERGENCE TO GRID, OR
- –SIMULTANEOUS PHASE DIFFERENTIAL BASELINE FROM STATION A TO STATION B;

10.(b), 20.(3): REFERENCE LINE OF KNOWN BEARING (CITE THE BEARING)
- –STATED LIMIT ON PREVIOUS PLAN, (WITH CONVERGENCE TO GRID IF APPLICABLE).

10.(c), 20(4): POINTS LISTED IN INTEGRATION TABLE (DO NOT CITE INVERSED BEARING)
- –SPECIFIED CONTROL POINTS (SCPs) A & B (2 OR MORE), OR
- –OBSERVED REFERENCE POINTS (ORPs) A & B (2 OR MORE), OR
- –A COMBINATION OF 2 OR MORE SCPs AND ORPs.

OR, MTM PER 31(b)

CENTRAL MERIDIAN MAY APPLY FOR ASTRONOMIC OBSERVATIONS PER 20(2)(b)

OR, 347°11'00" PER SEC. 10.

QUADRANTAL OR FULL–CIRCLE PER SEC. 10.

BEARINGS ARE UTM GRID, DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS FROM MONUMENT A TO B, SHOWN HEREON, HAVING A BEARING OF N12°49'00"W REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 16 (87° WEST LONGITUDE)

OR, NAD83 (ORIGINAL), OR A FUTURE CSRS EPOCH

NAD83 (CSRS) (1997.0).

PROJECTION, ZONE, DATUM, AND EPOCH (IF APPLICABLE) PER 20 (4)

OR MTM ZONE 10 (79° 30' WEST LONGITUDE)

OPTIONAL

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER–CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M–123.

(GOOD PLACE TO STATE CONVERGENCE UNDER 10.(b) IF APPLICABLE)

INTEGRATION DATA

18.(1)(i)(i) CALLS FOR THIS TABLE.

1. SPECIFIED CONTROL POINTS (SCPs) A & B, TIES FROM THE BOUNDARY TO SPCs SHOWN ON THE FACE OF THE PLAN;
2. OBSERVED REFERENCE POINTS (ORPs) A & B TIES FROM THE BOUNDARY TO ORPs SHOWN ON THE FACE OF THE PLAN;
   a) TIED TO SPCs BY CONVENTIONAL OR GPS VECTORS, E.G.:
      –TRANSIT AND CHAIN OR TOTAL STATION,
      –SIMULTANEOUS PHASE–DIFFERENTIAL BASELINES,
      –REAL TIME KINEMATIC (RTK) BASE AND ROVER BASELINES,
      –RTK BASE AND ROVER TRANSLATED COORDINATES;
   b) COORDINATES DIRECTLY OBSERVED USING GPS
      –PRECISE POINT POSITIONING (PPP),
      –REAL TIME NETWORK (RTN) COORDINATES FROM PROVIDER,
      –RTN COORDINATES TRANSLATED TO OCCUPIED SPCs.

NOTE: SINGLE GPS METHODS REQUIRE CALIBRATION ON A KNOWN POINT AND REDUNDANT VERIFICATION AFTER A TIME SHIFT.

ABBREVIATION

DEFINED IN SEC. 1, O.REG. 216/10

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).

SOURCE OF COORDINATES, PROJECTION, ZONE, DATUM AND EPOCH (IF APPLICABLE), PER 18 1.(i)(iv).

COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

STATEMENT PER 18.(1)(i)(iii)

URBAN (AT LEAST 2 DECIMALS)
RURAL (AT LEAST 1 DECIMAL)
REMOTE (THE NEAREST METRE)
(and something similar for feet)

POINT ID	NORTHING	EASTING
ORP A	5522311.25	397517.39
ORP B	5522374.13	397531.69
ORP C	5522354.89	397568.50

GOOD PLACE TO LIST ADDITIONAL ORPs INTENDED FOR THE INTEGRATION OF FUTURE PHASES OF YOUR PROJECT.

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

STATEMENT PER 18(1)(i)(ii)

URBAN

Positions and bearings from ties to "Specified Control Points"

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 10519980109 AND 10519980103, UTM ZONE 17, NAD83 (ORIGINAL).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999737.

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD83 (ORIGINAL).
COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
SCP 10519980103	4860956.05	618820.08
SCP 10519980109	4862790.76	617855.17

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

URBAN

Positions and bearings from ties to "Observed Reference Points" by Real Time Network.

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999737.

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (1997.0).
COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	4860956.05	618820.08
ORP B	4862790.76	617855.17

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

RURAL

Positions from ties to "Observed Reference Points" by Precise Point Positioning (PPP). Bearings from phase differential baseline.

BEARINGS ARE UTM GRID, DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS FROM MONUMENT A TO B, HAVING A BEARING OF N12°49'00"W, UTM ZONE 16 (87° WEST LONGITUDE) NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).

COORDINATES TO RURAL ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	5522311.3	397517.4
ORP B	5522374.1	397531.7
ORP C	5522354.9	397568.5

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

REMOTE

Positions from ties to "Observed Reference Points" by Precise Point Positioning (PPP). Bearings from Astronomic observations.

BEARINGS ARE UTM GRID, DERIVED FROM ASTRONOMIC OBSERVATIONS FROM MONUMENT A TO B, SHOWN HEREON, HAVING A BEARING OF N12°49'00"W REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 16 (87° WEST LONGITUDE) NAD83 (CSRS) (1997.0).

FOR BEARING COMPARISONS, A ROTATION OF 1°05'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 99M-123.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999725.

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, UTM ZONE 16, NAD83 (CSRS) (1997.0).

COORDINATES TO REMOTE ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	5522311	397517
ORP B	5522374	397532
ORP C	5522355	397569

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.