2016 DIRT Report
Version 10.0

Ontario Regional ORCGA Common Ground Alliance

DIG SAFE

Message from the President & CEO

Dear Damage Prevention Stakeholders,

The Ontario Regional Common Ground Alliance (ORCGA) has been collecting underground damage data since 2005 to better understand the root causes that lead to these events and to target and develop public awareness plans to minimize the risk of future events.

The ongoing challenge is, and has been, to gather and collect data from a broader cross section of industry stakeholders throughout Ontario. The hope is that more companies will see the value of participating in our DIRT program, and will be encouraged to submit quality data.

The importance of the DIRT Report, to the damage prevention industry, industry, is a key component in painting an accurate picture of where we are with respect to damage prevention and worker and public safety in Ontario. As more industry stakeholder companies submit data into the DIRT program, we will gain more insight and a clear view of how to enhance our public awareness and safety programs.

Despite the overall increase in damages through the 2014 to 2015 period, the numbers levelled off in 2016, with only a marginal difference between 2015 and 2016. Looking at the Geographic Council areas, approximately 50% have seen a reduction in numbers over 2015, with the other 50% showing an increase. However, the percentage of no locate damages is up from last year, indicating the need to reinforce the Dig Safe message and the One Call system. One general point to note is that for a number of the parameters for the data analysis, the use of “unknown” or “other” categories are selected. Emphasis should be placed on categorizing the data into specific categories versus the “catch all” wherever possible to improve the data and analysis accuracy.

Of great significance, however, is the dramatic decrease in third party damages and damages as a proportion of locate notifications over the past decade, as illustrated in Figure 16. This is a testament to increased awareness of the Call or Click Before You Dig message, as well as safe digging practices by the excavating community. The ORCGA membership continues to do an excellent job promoting the Dig Safe program, however, there is still a great deal of work to be done to promote public awareness and continuously improve our safe digging practices.

I sincerely encourage all facility owner stakeholders to get involved in the DIRT Program. By providing your data, we will ultimately be able to gain a clear and complete understanding of the total number of annual facility damages in Ontario. All ORCGA stakeholders will also benefit through access to a robust DIRT database from which statistical analysis and reports can be developed to determine progress in their respective damage prevention efforts.

This 2016 DIRT report is the result of dedicated work performed by the volunteers of our Reporting and Evaluation Committee, led by Co-Chairs Richard Durrer and Brandon Denton of Ontario One Call, and report co-ordinator Jennifer Parent, ORCGA.

On behalf of the ORCGA Board of Directors, I would like to extend a sincere thank you to the Reporting and Evaluation Committee for their excellent work in producing the 2016 DIRT Report!

Sincerely,

Douglas Lapp
President & CEO, ORCGA

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1.0 INTRODUCTION

The Ontario Regional Common Ground Alliance (ORCGA) is a non-profit organization promoting effective and efficient damage prevention for Ontario's vital underground infrastructure. Through a unified approach and stakeholder consensus, the ORCGA fulfills its motto of 'Working Together for a Safer Ontario'.

The ORCGA is a growing organization with over 500 active members and sponsors representing a wide cross section of stakeholders:

Electrical Distribution	Land Surveying	Railways
Electrical Transmission	Landscape/Fencing	Regulator
Engineering	Locator	Road Builders
Equipment & Suppliers	Municipal & Public Works	Safety Organization
Excavator	Oil & Gas Distribution	Telecommunications
Homebuilder	One Call	Transmission Pipeline
Insurance		

Electrical Distribution Electrical Transmission Engineering Equipment & Suppliers Excavator Homebuilder Insurance Land Surveying Landscape/Fencing Locator Municipal & Public Works Oil & Gas Distribution One Call Railways Regulator Road Builders Safety Organization Telecommunications Transmission Pipeline

The ORCGA works to foster an environment of safety throughout Ontario for all workers and the public. This is accomplished by offering practical tools while promoting public awareness and compliance of best practices in regards to underground infrastructure and ground disturbance practices.

The ORCGA welcomes open participation and new members on its various committees. In order to submit a suggestion, or to join a meeting, please visit www.orcga.com to learn about the scope of the various committees.

General inquiries about the ORCGA can be made to:

Ontario Regional Common Ground Alliance (ORCGA)
545 North Rivermede Road, Unit 102
Concord, ON L4K 4H1
Telephone: (905) 532-9836
Toll Free: (866) 446-4493
Email: office@ORCGA.com

To learn more about the ORCGA's Dig Safe Program, visit www.digsafe.ca.

Like and follow us on your favourite social media sites!

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1.1 DATA

The Damage Information Reporting Tool (DIRT) is the result of the efforts made by the ORCGA to gather meaningful data about the occurrence of facility events. An “event” is defined by the DIRT User’s Guide as “the occurrence of downtime, damages, and near misses.” Gathering information about these types of events give the ORCGA the opportunity to analyze the contributing factors and recurring trends. This allows the ORCGA to identify potential educational opportunities to meet our overall goals of reducing damages and increasing safety for all stakeholders.

The annual DIRT Report provides a summary and analysis of the known events submitted during the prior year, and as additional years of data are collected, it also provides the ability to monitor trends over time. The 2016 report focuses on the data gathered throughout Ontario during the three-year period between 2014 and 2016. This data can be helpful for all stakeholders to use as a benchmark for their damage prevention performance. It identifies current issues facing the industry, region and province.

Data Analysis Disclaimer: Industry stakeholders have voluntarily submitted their underground facility event data into DIRT. The data submitted is not inclusive of all facility events that occurred during the report year as it represents only the information voluntarily submitted by industry stakeholders.

The information presented in this report is based on current information provided to the ORCGA for events that occurred, or were updated, in 2016.

When reviewing statistics published in this report, it is also important to note that retroactive submissions by DIRT users, as well as updated events, will cause the volume of facility events submitted by year to change in each report.

In addition to the number of events submitted, an important factor is the completion of the associated information which allows for better overall analysis of the contributing factors. Each submitted record contains numerous data elements that are vital to understanding and interpreting the incidents reported in DIRT. It is important that stakeholders align their data collection and reporting practices with those found on the DIRT Field Form.

To gauge the overall level of completion of records submitted, the Data Quality Index (DQI) was implemented in 2009. This provides DIRT contributors a way to review the quality of the facility event records they submit.

When reviewing the statistics published in this report, it is important to note that only events with complete data were included; as records with missing data were removed from the analysis.

The DIRT system compares each field within each report submitted against the fields of all other reports in DIRT, to calculate the probability that it matches an already submitted event. Based on this, there is potential that the same event may have been submitted more than once (i.e. by both the excavator and the facility owner). Repeated reporting of the same event can offer the following benefits:

- Capture of data that may be included on one submission but was omitted on another;
- Insights regarding interpretation of Root Causes based on stakeholder group.

2.0 DATA ANALYSIS

2.1 FACILITY EVENT ANALYSIS

In 2016, the events have seen a slight overall increase over 2015. We will break out incidents to gain insight on where attention and efforts are to be made to reduce damages in the future.

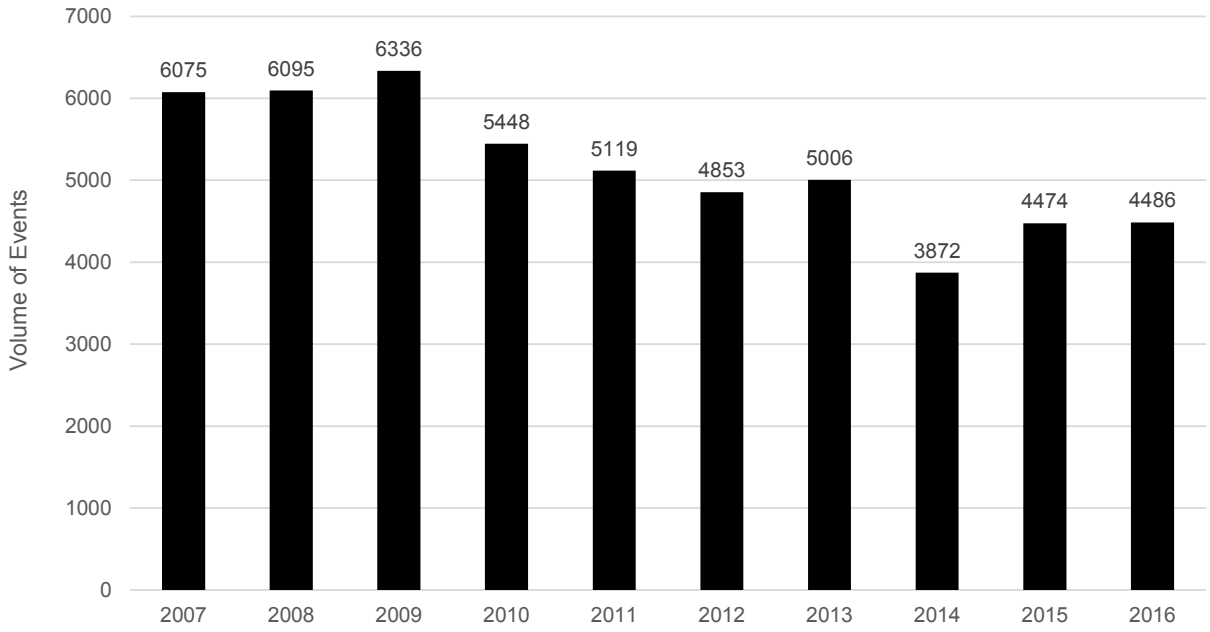


Figure 1: Facility Events Submitted by Year

2.2 FACILITY EVENTS SUBMITTED ACROSS ONTARIO

Table 1 outlines the ORCGA geographic areas and the constituent municipalities/cities.

Geographic Area	Cities
Chatham-Essex	Chatham-Kent ~ Essex
Grey-Bruce	Bruce ~ Grey
GTA-East	Durham ~ Kawartha Lakes ~ Northumberland Peterborough
Hamilton-Niagara	Haldimand ~ Halton ~ Hamilton-Wentworth ~ Niagara ~ Norfolk
London-St. Thomas	Elgin ~ Middlesex
ON-Central	Dufferin ~ Simcoe
ON-East	Akwesasne ~ Lanark ~ Ottawa ~ Prescott & Russell ~ Renfrew ~ Stormant, Dundas & Glengary
ON-North	Algoma ~ Cochrane ~ Greater Sudbury ~ Haliburton ~ Manitoulin ~ Muskoka ~ Nipissing ~ Sudbury ~ Temiscamingue ~ Timiskaming
ON-Northwest	Kenora ~ Rainy River ~ Thunder Bay
ON-Southeast	Frontenac ~ Hastings ~ Leeds & Grenville ~ Lennox & Addington ~ Prince Edward
ON-West	Brant ~ Brant ~ Oxford ~ Perth ~ Waterloo ~ Wellington
Sarnia	Lambton
Toronto	Peel ~ Toronto ~ York

Table 1: Geographic Area Breakdown by Region/Municipality/City

Figure 2 illustrates the number of events for each geographic area over the past three years.

There are minor fluctuations over the past three years, and the majority of Geographic Councils are seeing an upward trend in events.

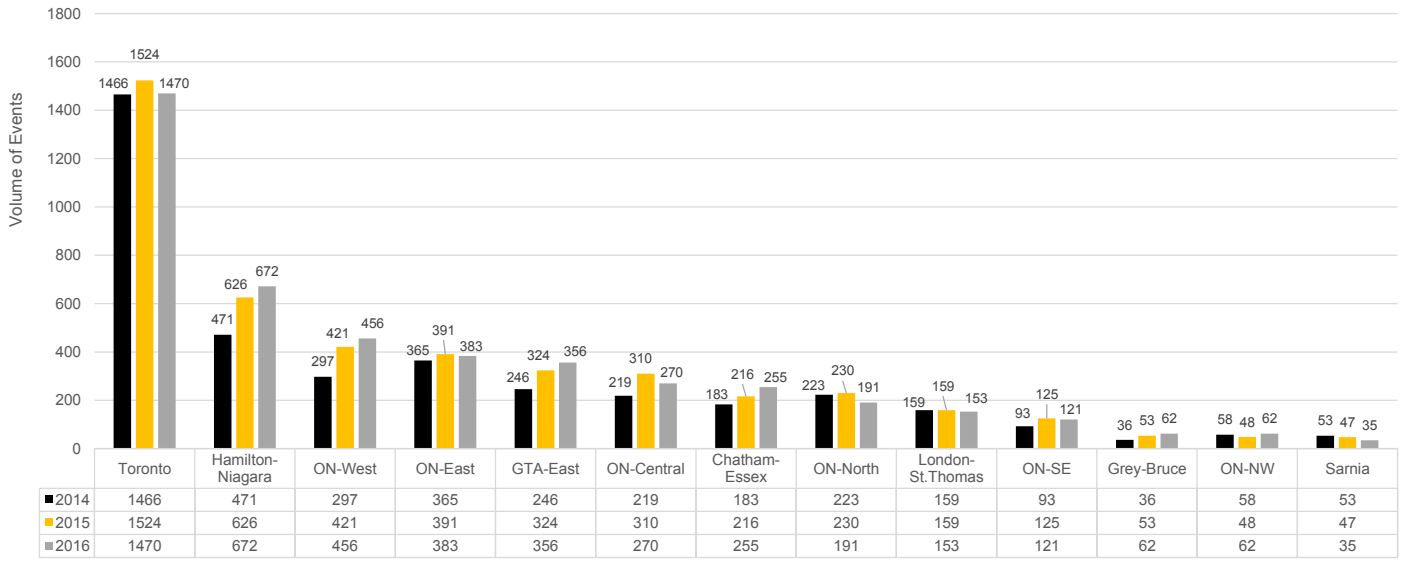


Figure 2: Volume of Events Submitted Per Geographic Area

As we had mentioned in 2015, due to the stabilization of new members, notifications have evened out. We expect this to continue with swings up and down due to either changes in the One Call centre's notification process or the current economic trend.

Geographical Area	2014	2015	2016
Chatham-Essex	232,924.00	248,628.00	240,533.00
Grey-Bruce	69,543.00	78,246.00	75,670.00
GTA-East	360,078.00	453,632.00	426,826.00
Hamilton-Niagara	979,111.00	1,086,631.00	1,051,814.00
London-St.Thomas	214,854.00	228,603.00	238,602.00
ON-Central	213,282.00	268,260.00	270,453.00
ON-East	479,021.00	595,851.00	610,348.00
ON-North	215,903.00	240,041.00	226,611.00
ON-NW	73,081.00	80,029.00	74,833.00
ON-SE	129,650.00	136,928.00	135,373.00
ON-West	497,052.00	565,196.00	575,108.00
Sarnia	84,160.00	92,770.00	87,807.00
Toronto	2,054,894.00	2,459,767.00	2,546,712.00
Grand Total	**5,603,553.00**	**6,534,582.00**	**6,560,690.00**

Table 2: Notifications Per Geographic Council

Figure 3 illustrates a distribution by geographic area comparing the number of events in 2016 where Ontario One Call was notified for a locate request versus not being notified for a request.

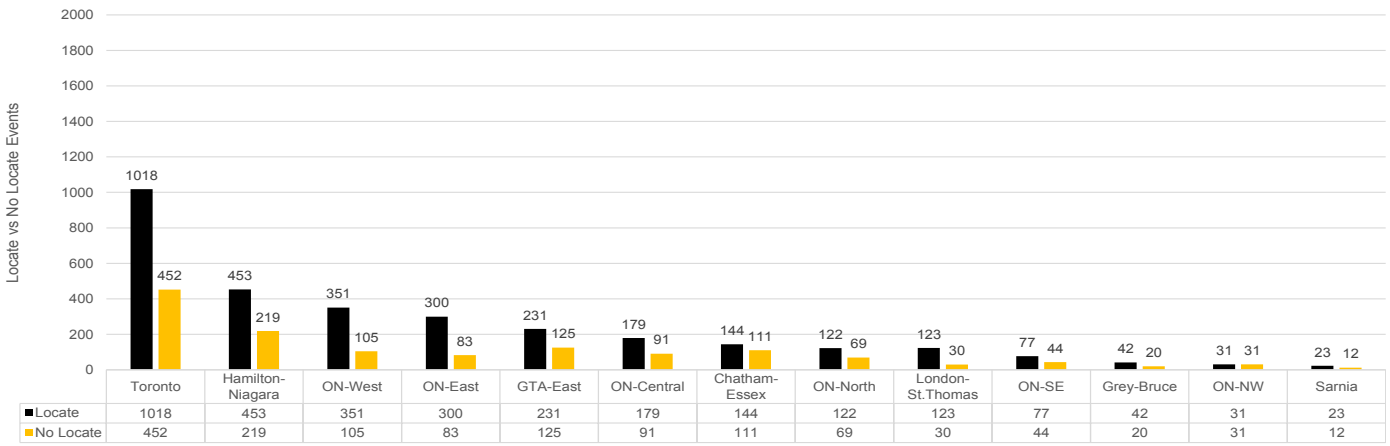


Figure 3: Locate Versus No Locate Events by Geographic Area

2.3 SUBMITTED FACILITY EVENTS BY STAKEHOLDER GROUP

Figure 4 illustrates a distribution of events by stakeholder group for the past three years. Based on the figure it can be seen that Natural Gas and Telecommunications continue to submit the highest volumes of events. Opportunity exists for additional stakeholders to submit events which would support future trend analysis.

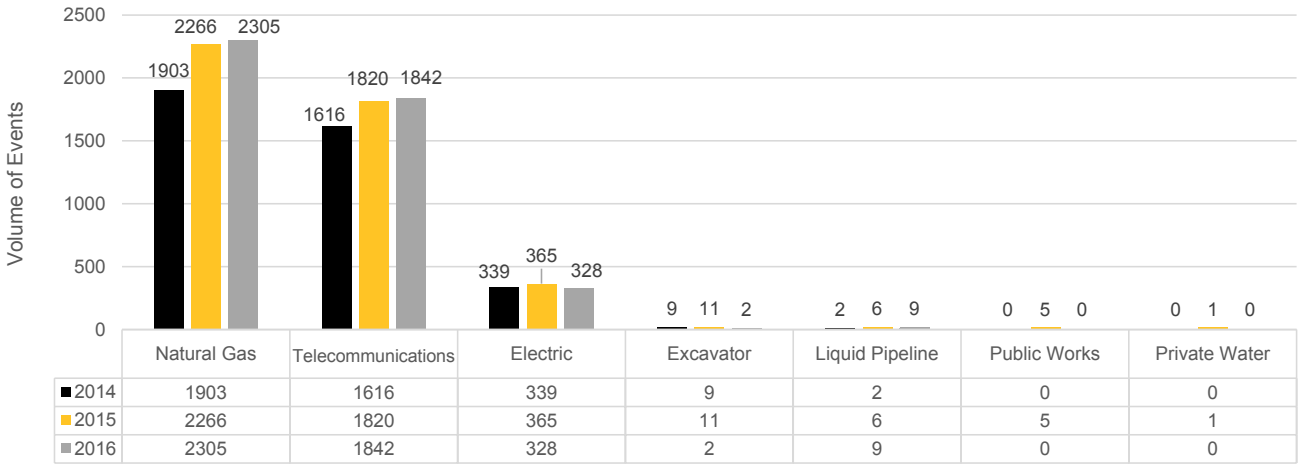
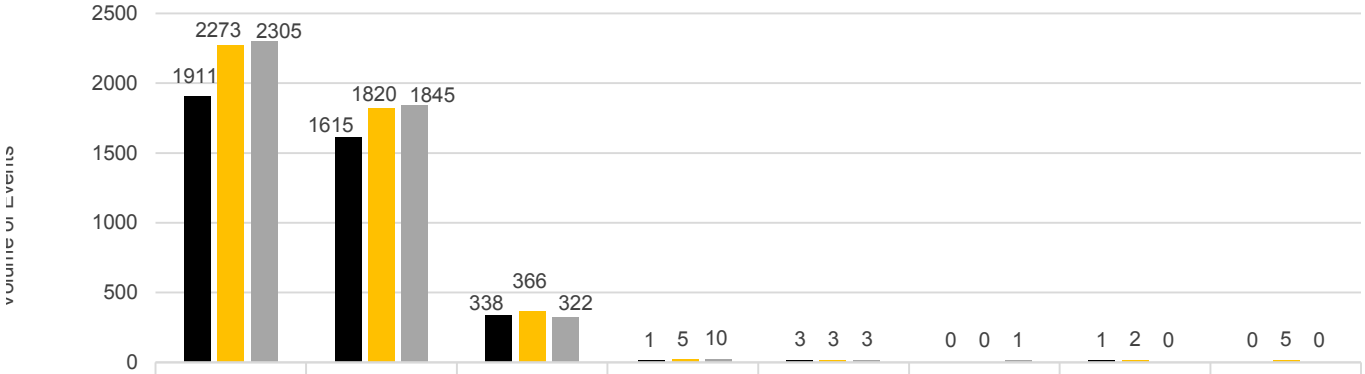


Figure 4: Facility Events Submitted by Stakeholder Group

2.4 SUBMITTED FACILITY EVENTS BY TYPE OF FACILITY OPERATION AFFECTED

Figure 5 illustrates that Natural Gas and Telecommunication can be seen as the primary facilities affected by events reported in DIRT. This aligns with the fact that Natural Gas and Telecommunication stakeholders continue to submit the majority of events.



	Natural Gas	Telecommunications	Electric	Liquid Pipeline	Cable TV	Sewer (Sanitary/Storm)	Unknown/Other	Water
2014	1911	1615	338	1	3	0	1	0
2015	2273	1820	366	5	3	0	2	5
2016	2305	1845	322	10	3	1	0	0

Figure 5: Submitted Facility Events by Type of Facility Affected

2.5 VOLUME OF EVENTS BY EXCAVATION EQUIPMENT GROUP

Table 3 outlines the types of excavation equipment included in each equipment group.

Group	Excavation Equipment Type
Hoe/Trencher	Backhoe / Trencher
Hand Tools	Hand Tools Probing Device
Drilling	Auger Boring Directional Drilling Drilling
Vacuum Equipment	Vacuum Equipment
Other	Data Not Collected Explosives Farm Equipment Grader/Scraper Milling Equipment Other

Table 3: List of Equipment Groups

Figure 6 illustrates a distribution of events caused by various groups of excavation equipment. In 2014 vacuum excavation equipment was being reported as its own excavation equipment group within the DIRT Report for the first time. In 2016 the Hoe/Trencher group continues to account for the largest volume of events. Efforts should be made by reporting groups to minimize listing equipment as “Other”, in order to improve the accuracy of data.

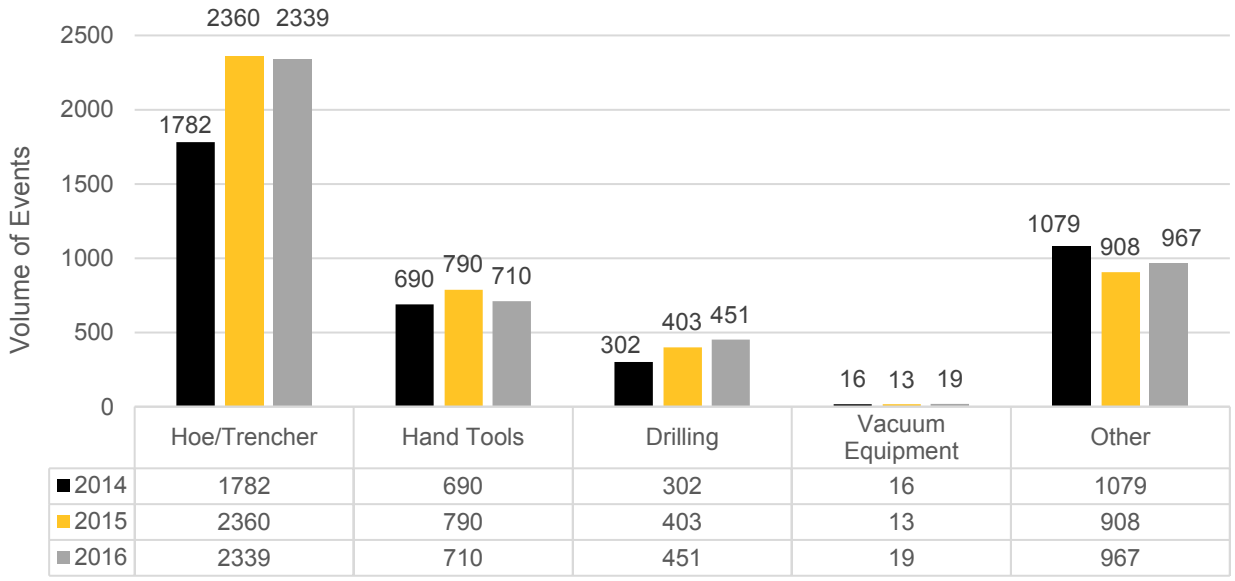


Figure 6: Submitted Facility Events by Excavation Equipment Group

2.6 FACILITY EVENTS BY ROOT CAUSE

Table 4 details the Root Cause subcategories included in each main category. Refer to the Root Cause Tip Card (Appendix A) for a more detailed breakdown of the meaning of each Root Cause subcategory. Depending upon which reporting stakeholder submitted the data for a facility event, Root Cause volumes can vary significantly.

Root Cause Category	Root Cause Subcategory
Excavation Practices Not Sufficient	Failure to Maintain Clearance Failure to Maintain the Marks Failure to Support Exposed Facilities Failure to Use Hand Tools Where Required Failure to Verify Location by Test Hole/Pot Holing Improper Backfilling Other Insufficient Excavation Practices
Locating Practices Not Sufficient	Facility Marking or Location Not Sufficient Facility Could Not Be Found or Located Incorrect Facility Records/Maps Facility Was Not Located or Marked
Miscellaneous Root Causes	Abandoned Facility Data Not Collected Deteriorated Facility One Call Centre Error Previous Damage Other
One Call Notification Practices Not Sufficient	Notification Not Made to One Call Centre Notification Made to One Call Centre but Not Sufficient Wrong Information Provided

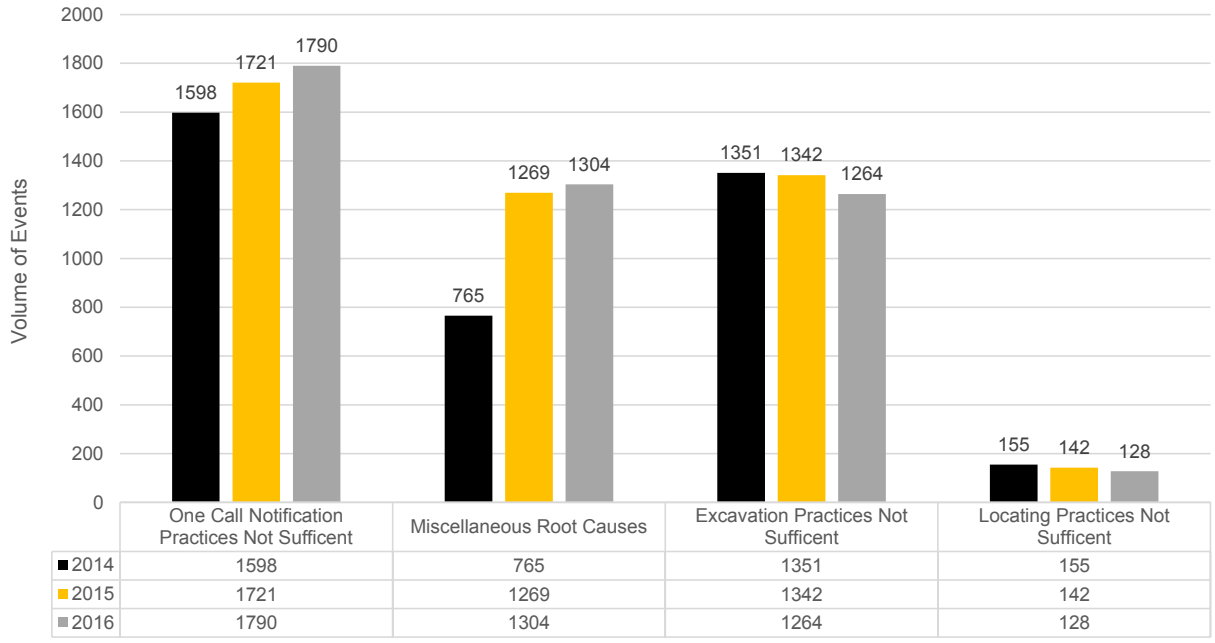
Table 4: Root Cause Category and Subcategory

In order to develop useful educational tools to improve the damage prevention performance in Ontario, it is important to examine the causes of reported events. To further understand the most common reasons for facility events, the distribution of Root Cause subcategories should be examined.

Figure 7 illustrates the distribution of events by Root Cause category. The most common identified causes of events are a result of One Call Notification Practices Not Sufficient, Miscellaneous Root Causes, and Excavation Practices Not Sufficient.

Emphasis should be made to reduce events due to One Call Notification Not Sufficient and to provide targeted outreach/ educational information to excavators to reduce events due to Excavation Practices Not Sufficient.

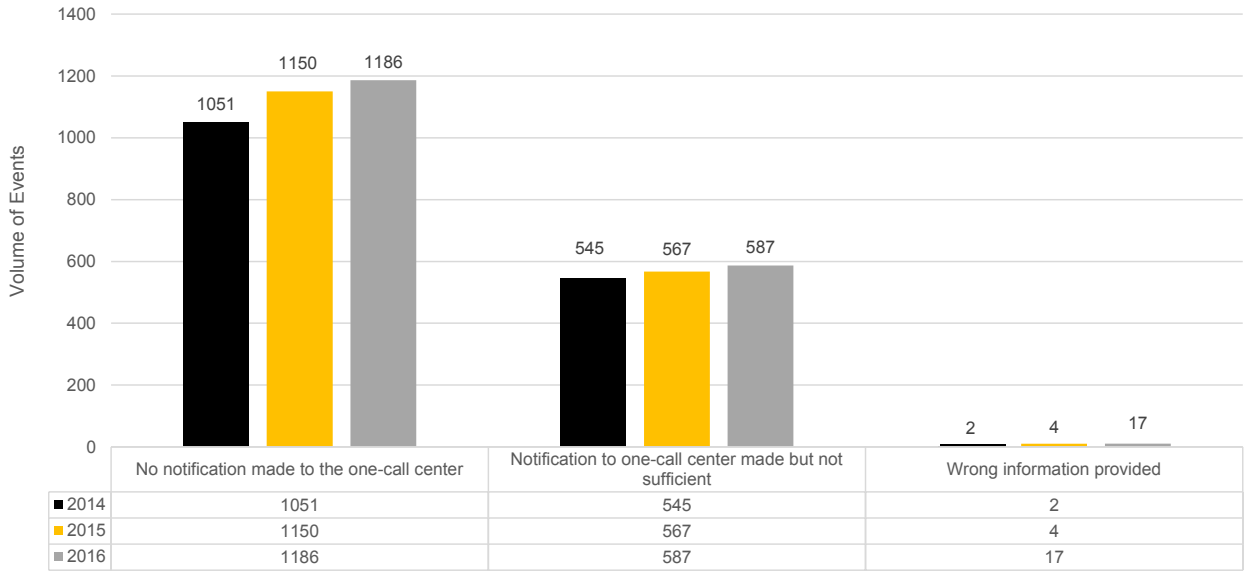
In order to improve the completeness of data, efforts should be made by reporting groups to minimize using Miscellaneous Root Causes.



	One Call Notification Practices Not Sufficent	Miscellaneous Root Causes	Excavation Practices Not Sufficent	Locating Practices Not Sufficent
2014	1598	765	1351	155
2015	1721	1269	1342	142
2016	1790	1304	1264	128

Figure 7: Facility Events by Root Cause Category

Figure 8 illustrates a breakdown of the Root Cause subcategories for the One Call Notification Practices Not Sufficient for the past three years. This figure illustrates the need to continually increase excavator and general public awareness about calling to request a locate before digging starts. Notifications Not Sufficient has shown a three year upward trend. This subcategory includes instances such as inadequate information or not allowing sufficient lead times for a locate request.

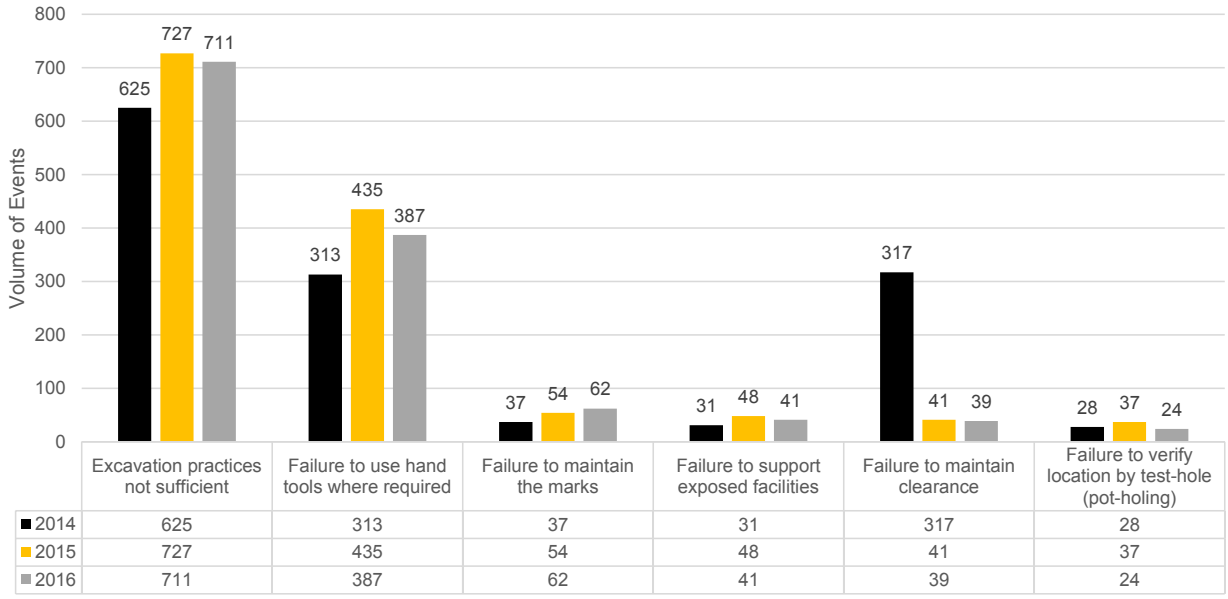


	No notification made to the one-call center	Notification to one-call center made but not sufficient	Wrong information provided
2014	1051	545	2
2015	1150	567	4
2016	1186	587	17

Figure 8: Facility Events by One Call Notification Practices Not Sufficient

Figure 9 illustrates a breakdown of the Root Cause subcategories for the Excavation Practices Not Sufficient for the past three years. This Root Cause subcategory is defined as any other excavator error, which cannot be classified as one of the other five Root Cause subcategories within the Excavation Practices Not Sufficient. Please see Appendix A.

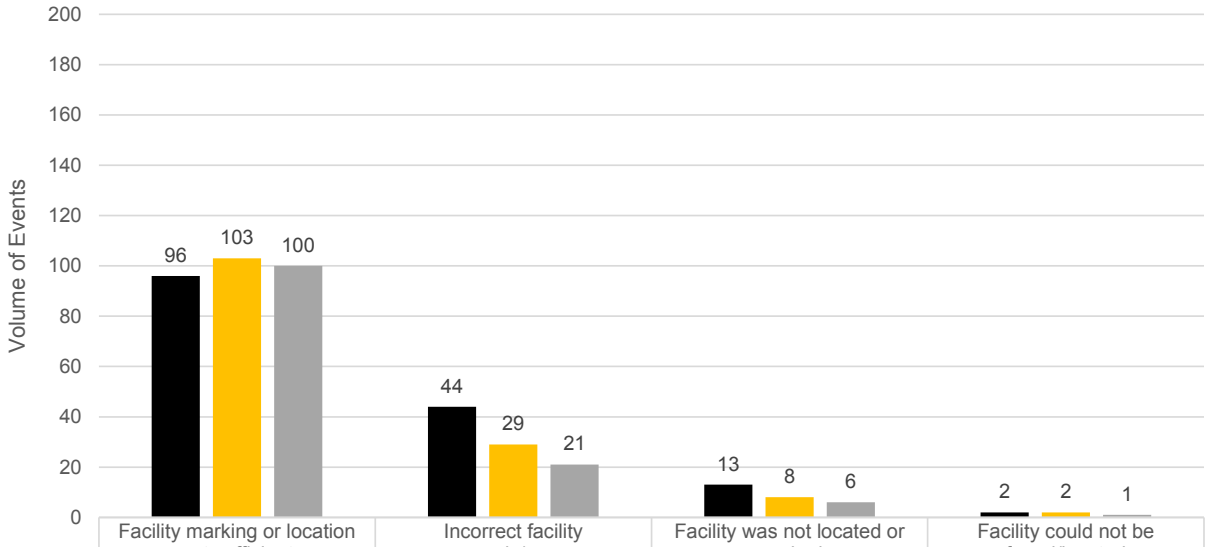
The next highest Root Cause is the failure to use hand tools where required. This needs to be examined to see if this choice is due to an assumption that manually operated equipment (eg: manual post hole digger) is considered digging by hand.



	Excavation practices not sufficient	Failure to use hand tools where required	Failure to maintain the marks	Failure to support exposed facilities	Failure to maintain clearance	Failure to verify location by test-hole (pot-holing)
2014	625	313	37	31	317	28
2015	727	435	54	48	41	37
2016	711	387	62	41	39	24

Figure 9: Facility Events by Excavation Practices Not Sufficient

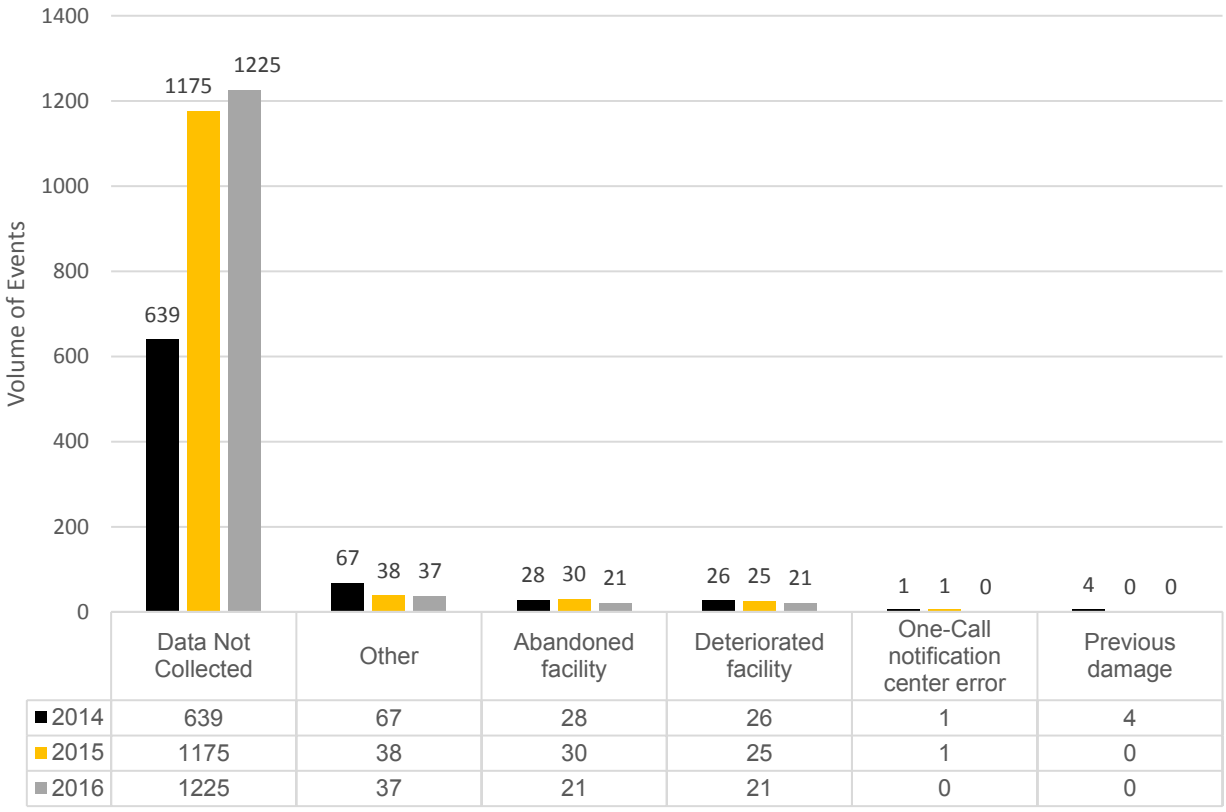
Figure 10 illustrates a breakdown of the Root Cause subcategories for the Locating Practices Not Sufficient for the past three years. The most prevalent Root Cause subcategory is Facility Marking or Location Not Sufficient. Refer to Root Tip Card (Appendix A) for examples of Facility Marking or Location Not Sufficient events.



	Facility marking or location not sufficient	Incorrect facility records/maps	Facility was not located or marked	Facility could not be found/located
2014	96	44	13	2
2015	103	29	8	2
2016	100	21	6	1

Figure 10: Facility Events by Locating Practices Not Sufficient

Figure 11 illustrates a breakdown of the Root Cause subcategories for the Facility Events by Miscellaneous Root Cause for the past three years. This figure illustrates the need for stakeholders to be sure and complete the Root Cause field. The Data Not Collected subcategory accounts for 27.3% (up from last year's total of 26.5%) of the total events for all Root Causes, and is a measure of all events where a Root Cause was not selected. Further efforts must be applied to categorize each event.

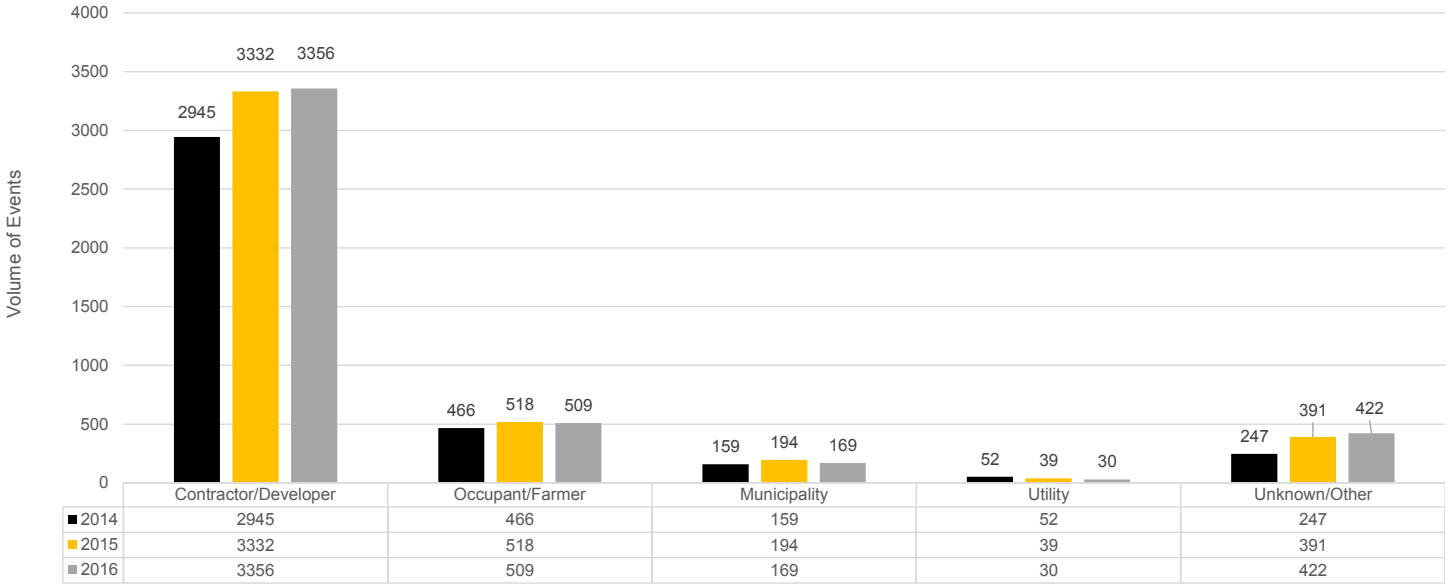


	Data Not Collected	Other	Abandoned facility	Deteriorated facility	One-Call notification center error	Previous damage
2014	639	67	28	26	1	4
2015	1175	38	30	25	1	0
2016	1225	37	21	21	0	0

Figure 11: Facility Events by Miscellaneous Root Cause

2.7 FACILITY EVENTS BY EXCAVATOR GROUP

Figure 12 illustrates the distribution of events by Type of Excavator showing that Contractor/Developer continues to be involved in the majority of the reported events. In order to develop useful educational tools to improve the damage prevention performance in Ontario, it is important to examine the parties causing reported events. Additional analysis of these groups is provided in the 3.0 Multiple Field Analysis section of this report.



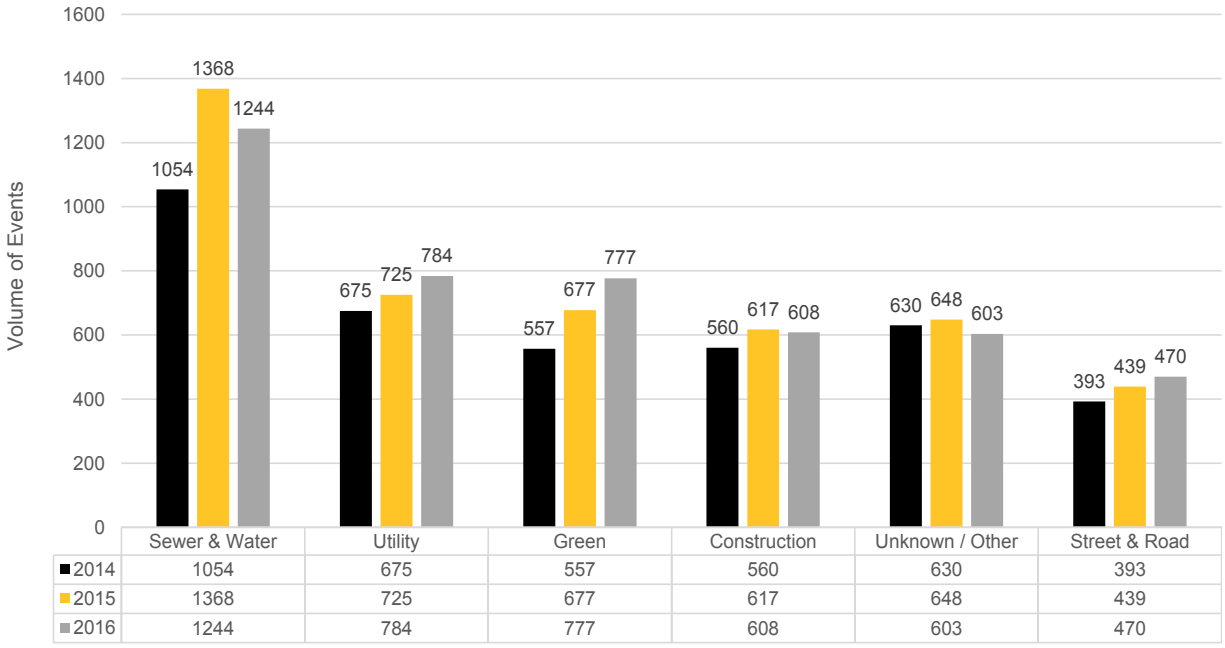
	Contractor/Developer	Occupant/Farmer	Municipality	Utility	Unknown/Other
2014	2945	466	159	52	247
2015	3332	518	194	39	391
2016	3356	509	169	30	422

Figure 12: Facility Events by Type of Excavator

2.8 FACILITY EVENTS BY TYPE OF WORK PERFORMED

In order to develop useful educational tools to improve the damage prevention performance in Ontario, we will examine the common Types of Work causing these events below.

Figure 13 illustrates a distribution of Events by Type of Work Performed. It is seen that the Sewer & Water and Utility groups continue to be involved in the majority of events submitted. However, please note that there is a drop in the number of incidents from 2015. Of concern are the Utility, Green industry and the Street & Road industry have shown an increase in events over the last three years. Emphasis should be placed by groups submitting events to reduce the amount listed as Unknown/Other in order to improve data completeness and accuracy.



	Sewer & Water	Utility	Green	Construction	Unknown / Other	Street & Road
2014	1054	675	557	560	630	393
2015	1368	725	677	617	648	439
2016	1244	784	777	608	603	470

Figure 13: Facility Events by Type of Work Performed

Table 5 illustrates the largest Type of Work Performed. When broken down into identifiable sub groups, Water is first with 761 events, followed by Fencing with 419 events, and then Building Construction with 365 events. This takes into account over one third of events and would provide the greatest impact in being reduced.

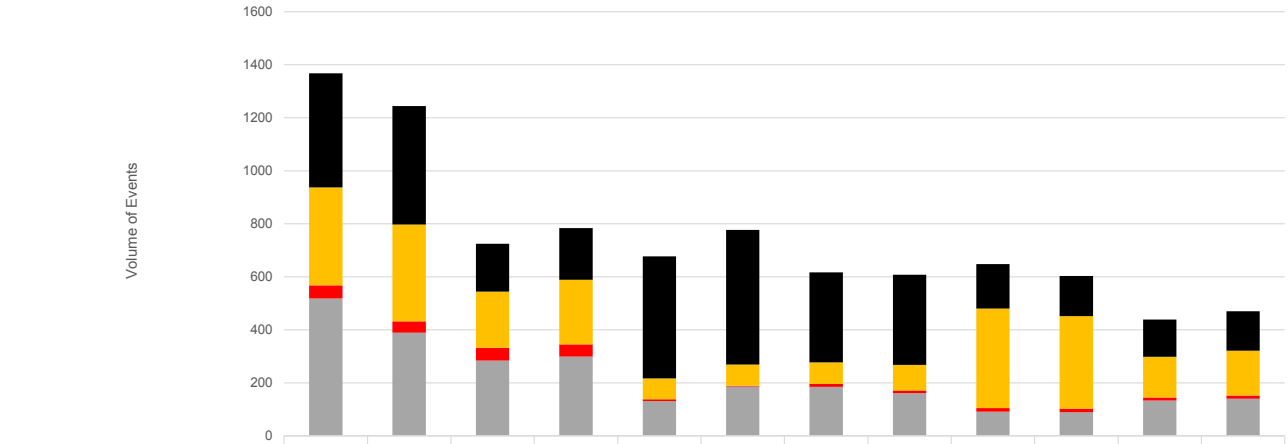
Group & Type of Work	2014	2015	2016
Construction			
Bldg. Construction	381	388	365
Driveway	106	132	143
Site Development	40	52	44
Grading	16	33	40
Bldg. Demolition	17	12	16
Green			
Fencing	258	352	419
Landscaping	259	313	347
Irrigation	2	10	7
Waterway Improvement	34	1	2
Agriculture	4	1	2
Sewer & Water			
Water	685	911	761
Sewer (Sanitary/Storm)	238	275	319
Drainage	131	182	164
Street & Road			
Road Work	187	254	323
Curb/Sidewalk	113	70	63
Storm Drain/Culvert	31	74	46
Pole	29	25	13
Traffic Sign	8	10	11
Traffic Signal	3	3	9
Street Light	10	2	5
Railroad Maintenance	3	1	
Public Transit Authority	9		
Utility			
Telecommunications	247	278	295
Electric	252	293	292
Natural Gas	150	96	119
Cable TV	25	58	77
Liquid Pipeline	1		1
Unknown / Other			
Unknown/Other	627	645	597
Data Not Collected	1	2	5
Engineering/Surveying	2	1	1

Table 5: List of Work Included in Each Work Group

3.0 MULTI-FIELD ANALYSIS

3.1 ANALYSIS OF ROOT CAUSE AND FACILITIES AFFECTED BY TYPES OF WORK

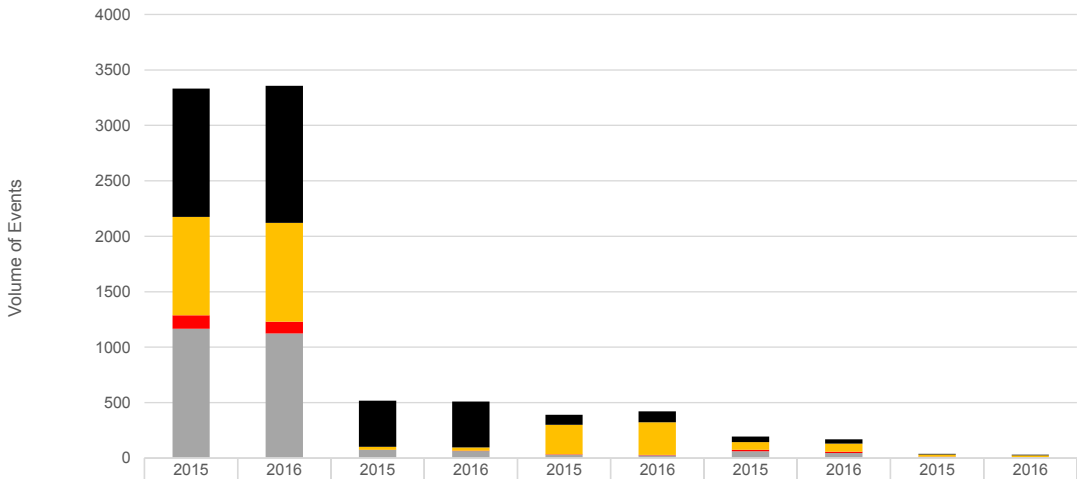
The following charts illustrate the known Root Causes of events for the six work groups of Sewer and Water, Utility, Green, Construction, Unknown/Other and Street & Road Work for the years 2015 and 2016.



	2015 Sewer & Water	2016 Sewer & Water	2015 Utility	2016 Utility	2015 Green	2016 Green	2015 Construction	2016 Construction	2015 Unknown / Other	2016 Unknown / Other	2015 Street & Road	2016 Street & Road
One Call Notification Practices Not Sufficent	431	447	181	195	460	508	340	340	168	151	141	149
Miscellaneous Root Causes	369	365	212	244	79	80	81	97	375	349	153	169
Locating Practices Not Sufficent	50	43	48	46	7	3	11	10	14	14	12	12
Excavation Practices Not Sufficent	518	389	284	299	131	186	185	161	91	89	133	140

Figure 14: Facility Events by Root Cause Group and Industry

Figure 15 illustrates that the Contractor/Developer excavator type still represents the majority of events submitted under the Excavation Practices Not Sufficient.

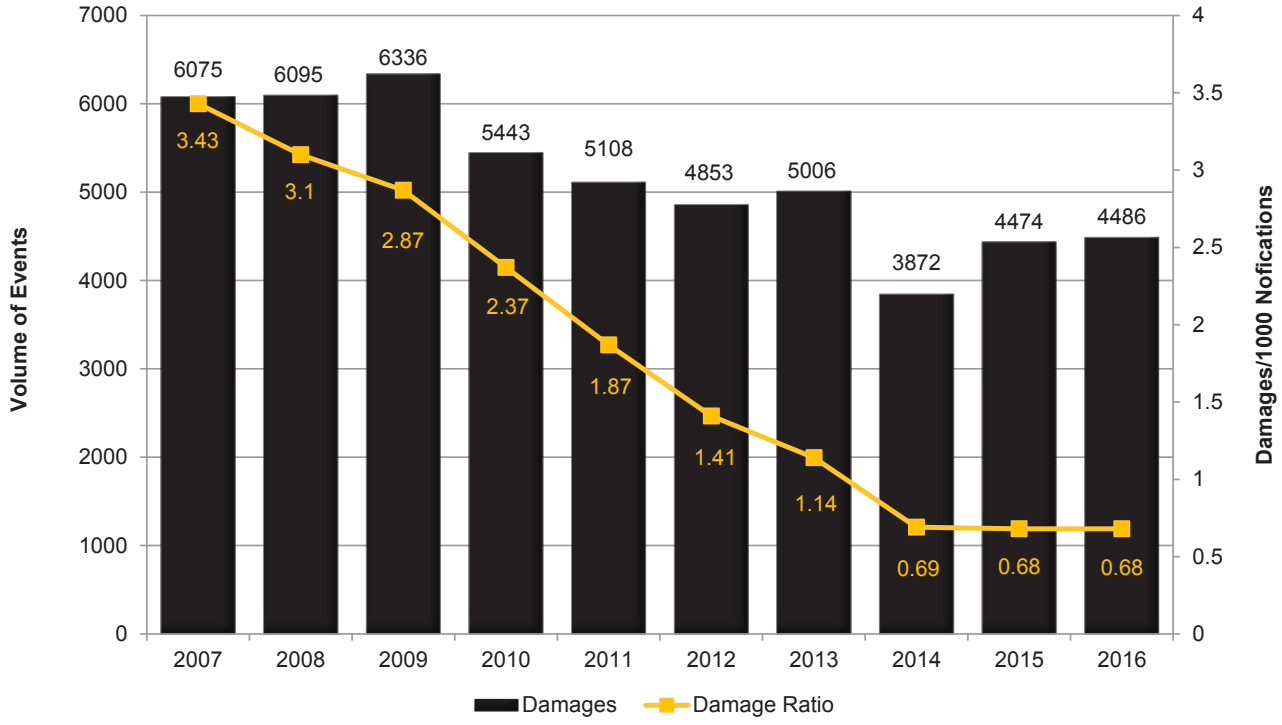


	2015 Contractor/Developer	2016 Contractor/Developer	2015 Occupant/Farmer	2016 Occupant/Farmer	2015 Unknown/Other	2016 Unknown/Other	2015 Municipality	2016 Municipality	2015 Utility	2016 Utility
One Call Notification Practices Not Sufficent	1157	1235	416	412	91	99	50	39	7	5
Miscellaneous Root Causes	888	892	27	30	266	294	70	73	18	15
Locating Practices Not Sufficent	121	106	3	3	3	5	13	11	2	3
Excavation Practices Not Sufficent	1166	1123	72	64	31	24	61	46	12	7

Figure 15: Facility Events by Root Cause Category and Excavator Type

Figure 16 illustrates the damage ratio relative to the volume of events over the past decade.

Industry practice is to measure damage prevention performance by the volume of damages per thousand notifications.



Mandatory Legislation has increased notification base

Figure 16: Damage Ratio- Damages/1000 Notifications

4.0 REPORT FINDINGS

4.1 DATA QUALITY INDEX INDICATIONS

Table 6 indicates the Data Quality Index (DQI) for each individual part of the DIRT Field Form. The DQI is a measure of data quality and consists of the evaluation of each organization that submitted records, in addition to the evaluation of each record submitted to DIRT. The overall average DQI is 71.6%.

The weight assigned to the various DIRT parts varies based upon its value in analyzing the event for damage prevention purposes, with Root Cause receiving the largest weight. The overall DQI for a set of records can be obtained by averaging the individual DQI of each record. The "2016 DQI" column in the table below represents the average of all 4486 submitted events in the 2016 dataset.

DIRT Parts	Relative Weight	2014 DQI	2015 DQI	2016 DQI
A: Who is submitting this information?	5%	100.0	100.0	100.0
B: Date and Location of the event	12%	78.6	76.5	76.9
C: Affected Facility Information	12%	90.0	90.4	90.3
D: Excavation Information	14%	83.5	86.2	85.8
E&F: Notification, Locating, Marking	12%	90.2	89.9	89.4
G: Excavator Downtime	6%	13.1	12.1	12.7
H: Description of Damage	14%	35.0	32.7	35.7
I: Description of the Root Cause	25%	81.9	73.0	72.0
Total Weighted DQI	100%	74.0	71.5	71.6

Table 6: DIRT Submission Parts and DQI

Of the various parts of the damage report, Parts G: Excavator Downtime and H: Description of Damage are often not included, as most of the organizations inputting data into DIRT do not track this information.

The DQI for Part 1: Description of The Root Cause has again decreased between 2015 and 2016.

4.2 RECOMMENDATIONS

#1 No Notification to One Call Centre

No Locates remains a significant issue as there has been an observed increase in the number of No Locate events in the last 3 years.

This is the major category leading to events as seen in (Figure 7) and broken out in (Figure 8). Of the 4486 events reported in 2016, 1186 or 26% were due to no notification being made to Ontario One Call.

This must be addressed as a primary focus of ORCGA education efforts within 2017 and subsequent future campaigns. Successes in this area have occurred from Dig Safe efforts but these efforts need to be reinforced and strengthened.

Particular focus should be placed on Dig Safe messaging to geographic areas which show abnormally high percentages of No Locate events (Figure 3).

#2 Excavation Practices Not Sufficient

Excavation Practices Not Sufficient remains a large cause of events.

Excavators notified the one call centre to have underground utilities marked, but an event still occurred due to the lack of careful excavation practices, such as:

- Other Insufficient Excavation Practices
- Failure to Use Hand Tools Where Required
- Failure to Maintain Clearance
- Failure to Maintain the Marks
- Failure to Support Exposed Facilities
- Failure to Verify Locations by Test-Hole (Pot-Holing)
- Improper Backfilling

This area did see some improvements, but continued progress is required.

This should be targeted in our education efforts. Further efforts to spread the adoption of safe excavating practices and the use of One-Call by all responsible parties (for example, home owners and contractors) is imperative to reducing the number of damage events.

#3 Data Not Collected:

DIRT data contributors continue to utilize the “catch all” categories when describing their damage events.

Emphasis should continue to be placed on increasing the number of stakeholders submitting into DIRT to provide a more accurate representation of all events within Ontario in each year.

Better information would greatly enhance the ability to focus education efforts in future campaigns.

Additional communication aimed towards data contributors, as well as in-field staff making the assessments of damage root causes, needs to occur so that the other specific categories of root causes are better utilized.

5.0 REGIONAL PARTNER DATA

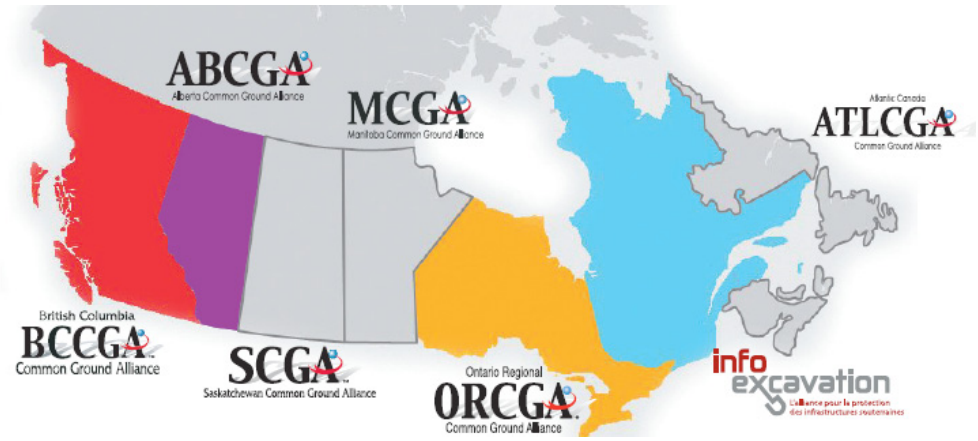
Each year, the CCGA Data Reporting and Evaluation Committee (DREC) collects information about damages to underground infrastructure reported in each province. In British Columbia, Alberta, Saskatchewan, Ontario, and Quebec, the data is collected through voluntary submission of information into a Virtual Private DIRT (Damage Information Reporting Tool) database. In Atlantic Canada, information is reported directly by participating infrastructure owners. Manitoba does not submit data to the CCGA DREC.

The purpose of the National DIRT Report is to identify national trends over time. The challenge to this point has been that only Quebec, Ontario and to a lesser-extent, British Columbia have collected enough data over a significant amount of time to begin identifying trends with real confidence in the data. In addition, bringing in data from new provinces each year requires re-balancing the dataset, which can have unintended effects on trend analysis if you are looking at specific regions.

That is not to say that the national data does not have value, but only that in its current state, the data has to be analyzed in deeper detail in order to fully appreciate its indications. For example, if one province has an increase in construction activity, it will show a corresponding increase in reported damages; or if the provincial notification centre reduces overall notifications per ticket, the analysis will show an increase in damages per notification. Over the next 2-3 years, national data will continue to increase and improve in quality to where it will have enormous value in making recommendations on a national scale, as well as giving the damage prevention industry a relatively accurate estimate of the societal costs of third party damages on underground infrastructure.

We hope that the presentation of National Data is useful to your organization. We encourage you to participate in reporting damages to your provincial CGA or provincial Virtual Private DIRT and say thank you to everyone who already does so. The data collected can have significant impact on training, education and marketing initiatives in the damage prevention industry.

Sher Kirk, Chair
Data Reporting and Evaluation Committee



National Report on Damage to Underground Infrastructure

Highlights 2013, 2014 and 2015

DAMAGE PREVENTION SYMPOSIUM

CCGA Canadian Common Ground Alliance

The Common Ground Alliance (CGA) created the Damage Information Reporting Tool (DIRT) in 2003 to document damages to underground infrastructure. Six Canadian regions currently report damages into the DIRT database.

INTERPRETING THE DATA

- Reporting in DIRT is voluntary; therefore, the data analyzed is not representative of incidents that have occurred.
- A significant number of queries were left unanswered in the damage reports completed by DIRT users. Despite those questions left blank, this report provides aggregate data from the participating provinces. Data is normalized where appropriate.
- The term "damage" refers to damages to underground infrastructure and near hits.(There are few near hit reports in DIRT.)

	Number of damages			Damages per business day*					
	2013	2014	2015	2013	2014	2015	Population 2015*	Damages per 1,000 locate requests	Damages per 1,000 notifications
B.C.	1,188	1,315	1,131	5	5	4.5	4,683,100	6.9	1.9
Alberta	30	2,934	2,645	-	12	10.4	4,196,500	6.4	1.6
Saskatchewan	1,037	682	788	4	3	3.1	1,133,600	5.6	1.9
Ontario	4,836	3,809	4,434	19	15	17.5	13,792,100	4.9	0.7
Quebec	1,240	1,198	1,088	5	5	4.8	8,214,900	4.8	2.3
Atlantic	-	-	21	-	-	0.8	2,371,100	0.7	0.7
TOTAL	8,331	9,938	10,107	33	40	40	35,851,800	5.7	1.5

* 254 business days per year **Source: StatisticsCanada

Across Canada, the number of damages being reported has increased; however, it is likely a reflection of increased awareness and use of the DIRT reporting tool. Atlantic Canada is reporting for the first time and data is not yet widely collected in that region.

The breakdown of the number of damages in each province is determined by a variety of contributing factors such as the level of economic activity and population. Accordingly, the majority of damages are reported primarily in Ontario, the most populous province.

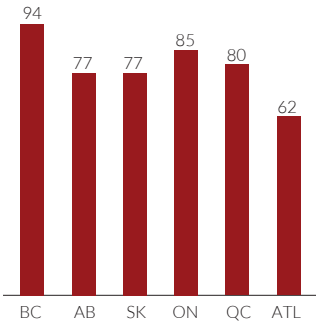
The ratio of the number of damages per 1,000 notifications can be compared between the reporting provinces. The reference criteria used for the comparison illustrates, for example, that while the number of damages are higher in Ontario, the ratio of damages to activity is lower than that of other provinces.

SOCIETAL COSTS IN CANADA WERE ESTIMATED IN EXCESS OF $1 BILLION

Significant impact of damage to underground infrastructure relates to societal costs including, emergency response, evacuation, environmental contamination, down-time, interruption / loss of production and sales, and redirection of safety services such as 9-1-1. Damage to natural gas infrastructure requiring deployment of First Responders represent 32% of the damages in Quebec, 48% in Ontario, 47% in Alberta and 15% in British Columbia.

In each case, Responders are deployed to the incident initiating a cost to the community tax base Cirano** developed a cost calculation tool for Info-Excavation. When applied to Canada-wide data, the result is a conservative estimate of the annual cost of damages to underground infrastructure.

79% of Damages Caused Service Disruption



**Center for Interuniversity Research and Analysis of Organizations (www.cirano.qc.ca/en)

37%OF DAMAGES WERE THE RESULT OF INSUFFICIENT EXCAVATION PRACTICES

Failure to request a locate and insufficient excavation practices remain the most common root causes for damage to occur during excavation.

British Columbia reported 63% of damages caused by failure to request a locate. The most frequent cause of damage in Quebec and Ontario remained insufficient excavation practices.

In the Excavation Practices Not Sufficient category, the most frequent cause of damage is Failure to use hand tools where required (70% of category) which underlines the need for more education around safely hand-exposing facilities.

In Locating Practices Not Sufficient category, 55% reported Facility Not Marked as the root cause, which raises questions about how data may be interpreted. If the number of reports of Facility Not Marked and Locate Not Requested are combined, the data shows that 43% of damages occurred when the facility was not marked.

Education of DIRT users remains a top priority for Alberta, as only 37% of reports indicated a definitive cause in the Root Cause categories.

		Locate Request Not Made	Excavation Practices Not Sufficient	Locating Practices Not Sufficient	Miscellaneous Root Causes
B.C.	2013	72%	26%	0%	2%
	2014	60%	37%	1%	1%
	2015	63%	36%	1%	0%
Alberta	2013	40%	20%	10%	30%
	2014	15%	20%	63%	1%
	2015	27%	13%	41%	16%
Saskatchewan	2013	28%	33%	23%	17%
	2014	28%	39%	22%	11%
	2015	7%	40%	52%	1%
Ontario	2013	33%	42%	6%	19%
	2014	33%	43%	3%	1%
	2015	35%	42%	4%	2%
Quebec	2013	33%	58%	7%	2%
	2014	34%	58%	5%	3%
	2015	31%	53%	14%	2%
Atlantic	2015	5%	81%	14%	0%
5 Provinces*		33%	37%	22%	4%

*Note: Atlantic Region data excluded from national totals

30%OF DAMAGES OCCUR DURING WORK ON SEWER AND WATER SYSTEMS

Water and Sewer work continues to show the highest percentage of damages reported across Canada. In British Columbia, damages occur more frequently during Construction work, with Water and Sewer work being the second highest percentage. In Quebec, work related to streets and roads showed a decline in damage rate, while the rate of damage for work on sewer and water systems has steadily increased.

Regardless of the type of work, backhoes and track hoes remain the excavation equipment most often used in all provinces when damage occurs (70%). Hand tools were the second highest most common equipment used when damage occurred (16%).

		Landscaping	Construction	Water / Sewer	Utility	Streets / Road Work
British Columbia	2013	32%	45%	13%	3%	7%
	2014	10%	38%	30%	13%	9%
	2015	12%	47%	23%	8%	14%
Alberta	2013	21%	21%	26%	11%	21%
	2014	14%	16%	31%	25%	14%
	2015	19%	13%	27%	4%	14%
Ontario	2013	19%	18%	33%	20%	11%
	2014	17%	18%	33%	22%	10%
	2015	18%	16%	38%	20%	9%
Quebec	2013	15%	13%	37%	10%	25%
	2014	14%	19%	40%	10%	19%
	2015	14%	16%	45%	8%	18%

Register with DIRT and Be Part of the Damage Prevention Solution

The Canadian Common Ground Alliance (CCGA) invites you to register with your Regional Partner Virtual DIRT and report damages to Canada's buried infrastructure. Doing so will allow more thorough analysis and enable damage prevention and safety solutions that will benefit all Canadians.

THE MORE INFORMATION WE HAVE ON DAMAGES, THE MORE EFFECTIVELY WE CAN TARGET OUR DAMAGE PREVENTION EFFORTS.

Alberta: cga-dirt.com/ab
British Columbia: cga-dirt.com/bc
Ontario: cga-dirt.com/orcga
Quebec: cga-dirt.com/qcvpd
Saskatchewan: www.cga-dirt.com/scga

6.0 ARTICLES

ARTICLE NO. 1

RESPECTING THE MARKS – THE VITAL THIRD STEP IN DAMAGE PREVENTION

Requesting a locate is only the very beginning when it comes to effective damage prevention. Even when a locate has been secured and utilities are accurately marked, damages can result from a lack of awareness around interpreting and respecting ground markings. As such, truly safe digging involves a three step process – call or click before you dig, wait for the locate and lastly, respect the marks. When one of these steps is missed, the results can be disastrous.

Running on instinct
In Ontario, a contractor was excavating along the west bound lane of a major corridor, when a force main was damaged, creating an emergency situation. A damage investigation ensued and it was discovered that prior to excavation, the utility had been accurately located, the work area had been marked, and the marks were valid. Furthermore, the markings and locate report correctly reflected the data contained within the utility records.

So what went wrong? The contractor had dug down 4-5 feet and when nothing was detected, continued to drill under the assumption that the force main was positioned at a depth that would not conflict with the excavation. Unfortunately, this assumption was wrong and the excavator did in fact make contact.

It is not uncommon for excavators to request utility depth data because they wish to excavate directly over top of a utility. However, this is never a safe practice: even minor inaccuracies or discrepancies in depth data could create a dangerous situation. Hand digging to one (1) meter on either side of a ground marking is the only safe approach to excavation.

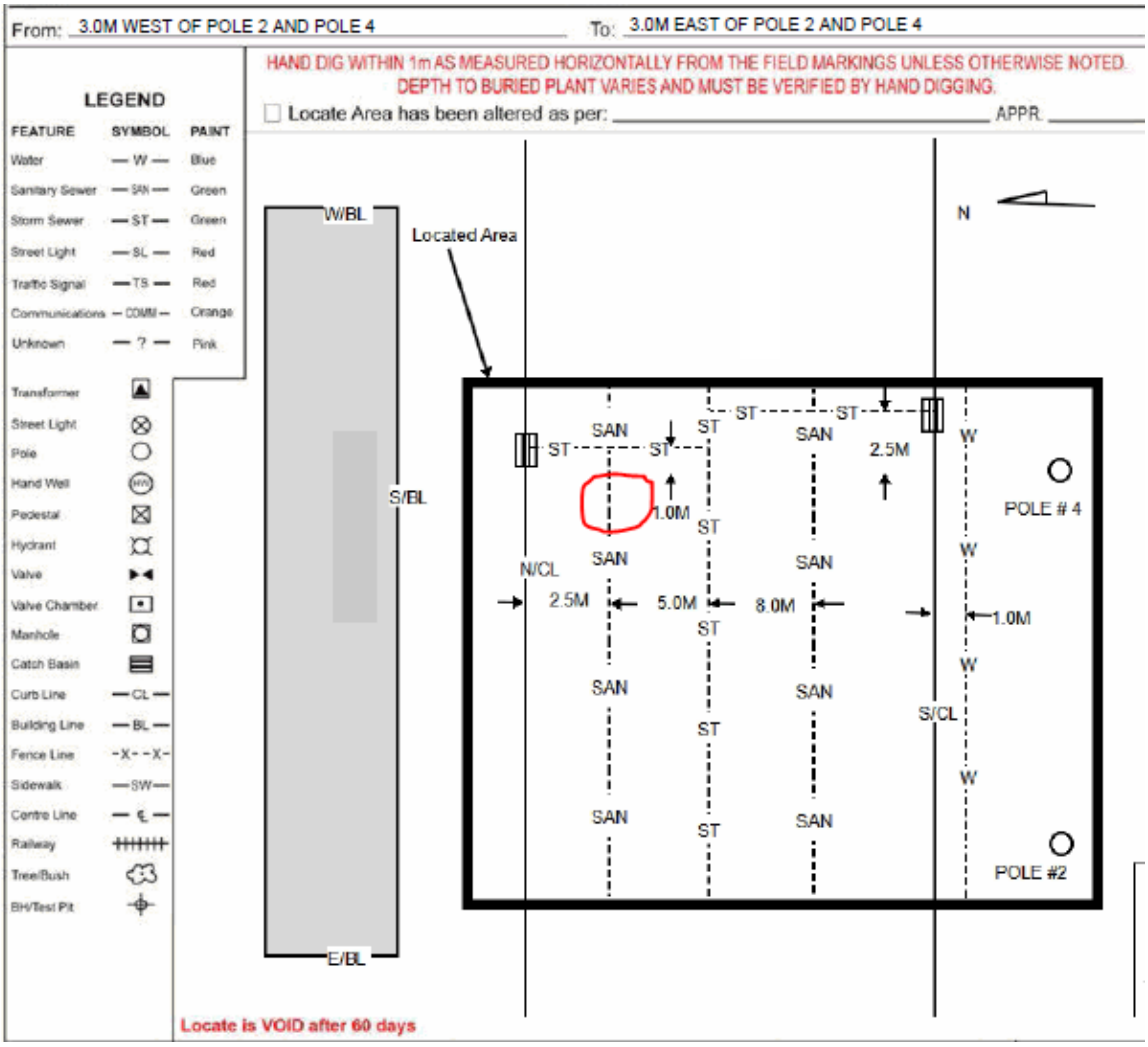
Learning the hard way
In this situation, the contractor relied on assumptions and ignored key principles of respecting the marks. The incident could have been easily avoided if the contractor had taken some vital damage prevention steps. For example, prior to drilling, the contractor should have performed test holes to determine the location of utilities within the project site so that minimum vertical clearances could have been created and a safe path could have been planned for the drill head of the directional drilling machine.

The contractor should have also leveraged hand tools to safely expose the utility prior to commencing the drilling activities. Furthermore, the contractor had the option of contacting a utility locate services company to complete Subsurface Utility Engineering (SUE) Quality Level B (utility locating) and Quality Level A (vacuum excavation) to verify that the utility depicted on the locate report was in fact reflective of city records.

The contractor should have also leveraged hand tools to safely expose the utility prior to commencing the drilling activities. Furthermore, the contractor had the option of contacting a utility locate services company to complete Subsurface Utility Engineering (SUE) Quality Level B (utility locating) and Quality Level A (vacuum excavation) to verify that the utility depicted on the locate report was in fact reflective of city records.

- Dig around the ground markings and not directly on top of them
- Don’t excavate outside of the area covered by the locate request without first obtaining an additional locate
- Carefully hand dig to the depth of excavation within one meter of the locate markings
- Consider ground markings valid for a maximum of one month at which point they should be remarked
- Hydro Vacuum and Pneumatic Excavation methods are safe approaches to excavation when performed by a qualified service provider

A useful guide for learning more about safe excavation practices is *ESA/TSSA Excavation Guidelines in the Vicinity of Gas Lines.* These Guidelines can be accessed from the ORCGA's Dig Safe website: www.digsafe.ca/safety-guidelines/.



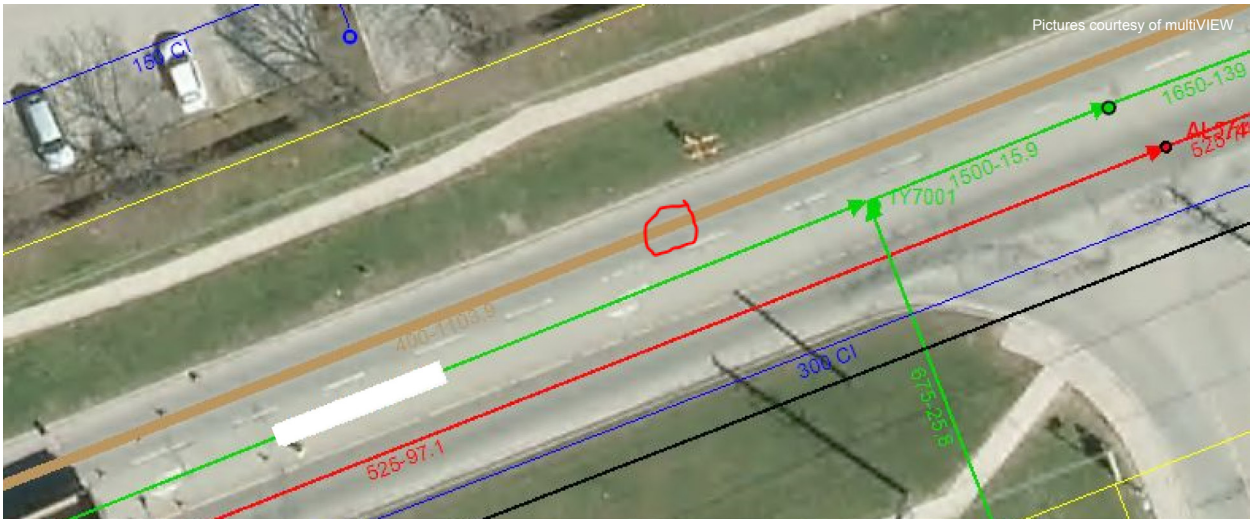


Photo caption: Prior to excavation, the utility had been accurately located and the work area had been marked. The markings and locate report correctly reflected the data contained within the utility records. However, damage occurred as a result of not respecting the marks or utilizing safe excavation practices.

ARTICLE NO. 2

PROTECTING MUNICIPAL DRINKING WATER AND SEWER SYSTEMS – THE ESSENTIAL ROLE OF LOCATES

Damages to the City's water or sewer (sanitary or storm) infrastructure occur infrequently; however, when damages do occur, the impact can be significant.

One of the biggest challenges the City has faced since joining Ontario OneCall is the perception by many excavators that water and sewer infrastructure are not as "important" as other buried utilities.

Excavators know that a hit on buried electrical or natural gas lines can cause significant property damage, injury or even death. However, they do not equate a "hit" of water or sewer utilities as having severe consequences, except for the nuisance of having to repair what they've hit (and in many cases, not always reporting the hit/repair to the City).

Under section 11. (1) of the Safe Drinking Water Act, 2002, the City, as an owner of a water distribution system, is required to ensure, in part:

2. That at all times in which it is in service, the drinking water system,

ii. is maintained in a fit state of repair

If a water system is damaged (either by breaking the watermain or breaking a water service that services a single property), the following impacts could occur:

- Potential drinking water contamination, resulting in people becoming ill from drinking the waterand/or resulting in a boil water advisory being issued by Public Health;
- Fines not only against the City, but potentially also against the excavator that caused the drinking water contaminationand/or contamination of the environment;
- Costs incurred to repair the damage and shut off water (licensed operator, city crew and associated equipment);
- Once the main has been repaired, water has to be flushed for several daysfrom a fire hydrant to clear any debris or contamination from the watermain, until the mandatory microbiological samples have been analyzed and the results show that the water is safe. The cost of this flushed water will be absorbed by the water customers (cost of "lost" water divided amongst all customers);
- A whole neighbourhood may be impacted for several hours or even days (think laundry, bathing, meal preparation, home dialysis patients);
- Private property damage and subsequent insurance claims against the Cityand/or the excavator (flooded basement);
- Reinstatements of road, sidewalks, boulevards, private lawns etc. - both temporary and permanent - have to be made; and,
- Public perception that the drinking water system is compromised and/or the water itself is unsafe.

Although excavators perceive that watermain breaks are unimportant, two excavators in Alberta discovered in 2012 and 2014 that causing a watermain break canresult in very expensive fines.

In 2012, Environment Canada was successful in fining an Alberta builder $285,000 under the Fisheries Act for releasing approximately 12 million litres of chlorinated drinking water into the North Saskatchewan River following the hit of a watermain during a construction project on July 20, 2009. An investigation by Environment

Canada determined that the construction manager of the project failed to obtain underground locates prior to excavating (Environment and Climate Change Canada, 2012).

In 2014, Environment Canada fined another Alberta company $185,000 under the Fisheries Act for two separate watermain breaks. The first break occurred on June 2, 2012 when a high pressure watermain was broken. This break discharged approximately 18,000 litres of chlorinated water into a local storm sewer drain which lead to a fish-bearing river. On July 2, 2012, the contractor broke the same watermain only metres from the first main break. An estimated 16,000 litres of chlorinated water was discharged during the second event. Environment Canada determined that the company failed to follow the guidelines set out in Alberta's Occupational Health and Safety Code by using a backhoe within one metre of the pipeline (Environment and Climate Change Canada, 2014).

In both cases, the root cause was due to the excavators not following best practices, specifically:

- Failure to obtain locates
- Failure to use hand tools where required

While most serious impacts and/or fines are from impacts to drinking water systems, damage to sewer infrastructure also has risks that excavators don't always consider. The greatest risk from damaging sewer infrastructure is contamination of the environment. A discharge of untreated sewage from a sanitary sewer line could enter a storm sewer and then enter a nearby waterway, or in worst case, if a sewer line and a watermain are both damaged, the untreated sewage could enter and contaminate the drinking water system.

Excavators need to take locates for water and sewer infrastructure as seriously as the locates for other utilities that they perceive as being more "dangerous" or costly to repair. The impacts of a break can have long-term negative impacts, and result in costly fines or insurance claims. Municipalities are very serious about the correct use of their citizens taxes and fees and are morally and legally obligated to ensure the safety of the drinking water for their citizens. By treating water and wastewater infrastructure as seriously as other buried utilities, excavators can assist municipalities in maintaining the integrity of the drinking water system and thus ensure the safety of all citizens who trust that the water coming out of their tap is safe to drink.

ARTICLE NO. 3

Details Matter

Despite best intentions, we sometimes manage to accidentally get into trouble. The excavation industry is not immune to this fact.

I would like to share one such example that occurred a few years ago. Although the example I wish to share with you occurred some time ago, unfortunately the same scenario still occurs to this day. Before I proceed with my example, it is important to note that the names and location of those involved will not be disclosed in this case study. These folks set out their day with the best of intentions to get the job done right, and, at the end of the day go home to their families.

This incident occurred on a cold January day. A contract was granted by the city to upgrade the street's underground infrastructure. The location was in the old part of the city and had numerous amounts of buried utility infrastructure that supplied several businesses.

Due to past excavations over a period of 170 years, the old area contained shale rock intermixed with various fill material making ground conditions extremely difficult for digging.

The contractor in charge of upgrading the underground infrastructure followed the proper procedures and obtained all of the required locates needed prior to starting the job. The operators assigned to excavate were all very experienced and had an extensive training background. Early morning came and they began their walk of the site with locates in hand. They carefully reviewed the locate sheets while comparing the locate ground markings with the measurements provided. Everything seemed to be accurate and now confidently they could safely begin to excavate. As it often occurs, one of the locate marks happened to be directly where they needed to excavate.

As specified in the "Guideline for Excavation in the Vicinity of Utility Lines", the construction crew carefully hand dug to day light the gas main. Their purpose was to find and safely expose the 3-inch gas main. After spending many hours and quite a substantial amount of work, they located a steel pipe directly underneath the locate marks. The decision was made to use mechanical equipment to widen the excavation pit.

It wasn't very long (10:30 AM) before they heard that terrible, unnerving high pitched screaming air blast sound – the sound of high pressure, natural gas escaping through the damaged portion of a plastic gas main! Since the excavation took place in a busy downtown area intersection, police and fire services were on scene within minutes immediately closing traffic flow, and evacuating all people from their businesses and apartments.

Within minutes the gas utility repair crew also arrived and scrambled to determine the extent of the damage and those who were affected by the damaged gas main. Due to the escaping gas, the pressure in the gas main dropped too low and too fast for supply to all downstream gas operated appliances.

The gas had to be shut off to all customers in the surrounding area. This would include shutting off the valve on the riser of approximately 100 individual gas meters. Time was of the essence since it was winter.

Once the gas main was made safe, the distributor proceeded to make the repairs on the plastic main. It took the gas crew nearly 7.5 hours to make all necessary repairs to the gas main before re-energizing it. (Remember that this occurred in January!). Businesses, residents, traffic were then all allowed to return back to normal.

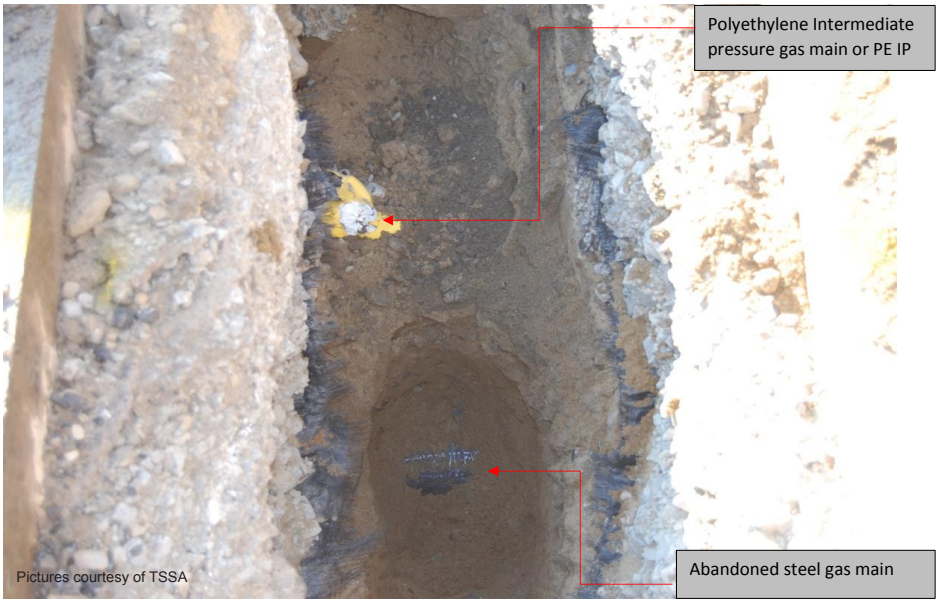
What Went Wrong?
Once the dust (or should I say, snow) settled, a proper inspection could take place in order to determine contributing factors, direct causes and the root cause of what went wrong. As the regulatory authority for underground fuels infrastructure in Ontario, the TSSA conducted the inspection. The locate sheets and locate ground markings were verified and found to be accurate.

What was missed and how could this have happened?

The inspection confirmed that the contractor did not understand, nor did he know, that the gas main they had safely exposed was an abandoned line.

The locate sheet had identified that the gas main marked was composed of polyethylene plastic. The locate sheet stated: 3" PE IP (polyethylene Intermediate pressure). What the contractor actually day-lighted was an old abandoned 4 inch steel gas main. The steel main looked brand new despite the fact that it was abandoned 25 years ago.

Granted, 4 inch and 3 inch look alike, but plastic and steel cannot be confused. The contractor simply did not notice or know what PE IP is an acronym for polyethylene plastic and intermediate pressure.



Lesson Learned: Details Matter
If the contractor did not know what PEIP meant, he or she should have made a quick call to the distributor's local damage prevention representative for assistance. The representative would have explained the difference and the contractor would have kept looking and found the PEIP main immediately next to the old, abandoned steel main.

Thankfully, no one was injured. None-the-less, it ended up being a very expensive lesson for the contractor and a substantial inconvenience to the local businesses, residents and traffic.

7.0 EXCAVATOR OF THE YEAR

The Excavator of the Year distinction is presented to an excavator with the best-in-class safe digging practices. Each year a subset of the R&E Committee, consisting of representatives of each of the utilities, is tasked with reviewing each contractor's individual damage ratio. The damage ratio is dependent on the volume of locates, of which each excavator must have a minimum of 500, measured against the number of digging related damages to the underground structure. The recipient of the award is the excavator with the lowest ratio who best reflects the type of work in each category represented.

Electric	LANGLEY UTILITIES CONTRACTING	**Langley Utilities Contracting**
Gas	Drain-All	**Drain-All ltd.**
Homebuilder	minto	**Minto Group Inc.**
Landscape		**Loki reforestation Ltd.**
Road Builder	POWELL CONTRACTING LTD.	**Powell Contracting Ltd.**
Sewer/Water	LM Enterprises Sewer & Watermain Contractors	**LM Enterprises**
Telecommunications	telcon datvox network cabling	**Telcon Datvox Inc.**
Most Improved	Guild Electric Limited	**Guild Electric Limited**

8.0 APPENDICES

Appendix A: Root Cause Tip Card

OPERATOR ISSUES

Facility Was Not Located or Marked
No locating or marking was completed prior to excavation activities.

Example: The company received a valid ticket, but did not mark, locate, or communicate with excavator prior to start of work.

Facility Marking or Location Not Sufficient
Includes all areas where marking was insufficient.

Example: Locator marked the work zone, but missed a service.
Locator misread the ticket and did not locate the entire work zone.
Facility was outside the tolerance zone.

Facility Could Not be Found/Located
Type of facility, depth, or lack of records prevented locating of facility.

Example: Plastic pipelines installed without tracer wires.
HDD installed facilities at depths that cannot be located.

Abandoned Facility
This damage was caused by an abandoned facility issue.

Example: The abandoned facility may have been located, instead of the active facility.
An abandoned facility may have been located, but it may have been found active after the excavation exposed the facility or damaged it.

Incorrect Facility Records/Maps
Incorrect facility records or maps led to an incorrect locate. (This does not include facilities missing from maps.)

Example: Records show the facility located on the wrong side of the street, and ticket was cleared.

Deteriorated Facility
Those situations in which an excavation disrupts the soil around the facility resulting in damage, failure or interruption of service. However, the deterioration and not the excavation caused the facility damage.

Example: An excavator reports a gas odor, investigation proves it is coming from an old cast iron pipeline.

Previous Damage
A significant period of time has passed from the actual damage to the failure or discovery of the damages.

Example: Pipe coating was damaged during a previous excavation and was not reported. Subsequently, a corrosion leak occurred.

EXCAVATOR ISSUES

No Notification Made to the One-Call Center
Excavator did not call the one-call center, includes occasions when notification was not required.

Excavation Practices Not Sufficient
The excavator did not use proper care or follow the correct procedures when excavating near a facility. Optionally, choose one of the following 2nd-level causes:

Failure to Maintain Clearances While Using Power Equipment - as defined by applicable state regulations or underground facility owner.
Failure to Maintain Marks - The marks deteriorated or were lost and the excavator failed to request that they be restored/refreshed.
Failure to Support Exposed Facilities - Facility damage due to lack of support in accordance with generally accepted engineering practices or instructions provided by the facility operator.
Failure to Use Hand Tools - Failure to use hand tools where required.
Failure to Verify Facility by Test Hole - Some state regulations define a “tolerance zone” around buried facilities and require the accuracy of the facility marks be verified by exposing the facility by hand digging prior to excavation within the tolerance zone, or require hand digging or special precautions when working within the tolerance zone.
Improper Backfilling - Damage caused by improper materials (ex: large/sharp rocks) in the backfill or improper compaction of the backfill.

Wrong Information Provided
This damage occurred because an excavator provided the wrong excavation location to the notification center, or there was a miscommunication between stakeholders.

Example: Excavator used ITE to notify and indicated the wrong dig site.
After speaking with excavator, the locator incorrectly cleared a ticket.

Notification to the One-Call Center Made, But Not Sufficient
The excavator contacted the notification center, but did not provide sufficient information, or the excavator did not provide sufficient notification time according to state law.

Example: Excavator did not wait 48 hours before digging.
Excavator was excavating on an expired ticket.

ONE-CALL CENTER ISSUES

One-Call Center Notification Error
Includes all issues related to the center such as incorrectly entered data, ticket transmission failures, and stakeholder omissions, et al.

Example: This would include damages that occurred because the center’s database registry had not been updated to reflect correct location of gas facilities.
The one-call center system crashed and failed to deliver the ticket.

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DIRT

Appendix B:

Rev: 8/2/2016
'*' indicates a Required Field

Damage Information Reporting Tool (DIRT) - Field Form

Part A – Who is Submitting This Information

Who is providing the information?

☐ Electric ☐ Engineer/Design ☐ Equipment Manufacturer
☐ Excavator ☐ Insurance ☐ Liquid Pipeline ☐ Locator ☐ Natural Gas
☐ One-Call Center ☐ Private Water ☐ Public Works ☐ Railroad
☐ Road Builders ☐ State Regulator ☐ Telecommunications ☐ Unknown/Other

Name of the person providing the information:

Part B - Date and Location of Event

***Date of Event:** (MM/DD/YYYY)
***Country** ***State** ***County** **City**
Street address **Nearest Intersection**
***Right of Way where event occurred**

Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Public-Other
Private: ☐ Private Business ☐ Private Land Owner ☐ Private Easement
☐ Pipeline ☐ Power /Transmission Line ☐ Dedicated Public Utility Easement
☐ Federal Land ☐ Railroad ☐ Data not collected ☐ Unknown/Other

Part C – Affected Facility Information

***What type of facility operation was affected?**

☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer (Sanitary Sewer)
☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/Other

***What type of facility was affected?**

☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐ Unknown/Other

Was the facility part of a joint trench?

☐ Unknown ☐ Yes ☐ No

Was the facility owner a member of One-Call Center?

☐ Unknown ☐ Yes ☐ No

Part D – Excavation Information

***Type of Excavator**

☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality ☐ Occupant
☐ Railroad ☐ State ☐ Utility ☐ Data not collected ☐ Unknown/Other

***Type of Excavation Equipment**

☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling ☐ Directional Drilling
☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper ☐ Hand Tools ☐ Milling Equipment
☐ Probing Device ☐ Trencher ☐ Vacuum Equipment ☐ Data Not Collected ☐ Unknown/Other

***Type of Work Performed**

☐ Agriculture ☐ Cable Television ☐ Curb/Sidewalk ☐ Bldg. Construction ☐ Bldg. Demolition
☐ Drainage ☐ Driveway ☐ Electric ☐ Engineering/Survey ☐ Fencing
☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline ☐ Milling
☐ Natural Gas ☐ Pole ☐ Public Transit Auth. ☐ Railroad Maint. ☐ Road Work
☐ Sewer (San/Storm) ☐ Site Development ☐ Steam ☐ Storm Drain/Culvert ☐ Street Light
☐ Telecommunication ☐ Traffic Signal ☐ Traffic Sign ☐ Water ☐ Waterway Improvement
☐ Data Not Collected ☐ Unknown/Other

Part E – Notification

***Was the One-Call Center notified?**

☐ Yes (If Yes, Part F is required) ☐ No (If No, Skip Part F)

If Yes, which One-Call Center?
If Yes, please provide the ticket number

Part F - Locating and Marking

***Type of Locator**

☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected ☐ Unknown/Other

***Were facility marks visible in the area of excavation?**

☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

***Were facilities marked correctly?**

☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

Part G – Excavator Downtime

Did Excavator incur down time?
☐ Yes ☐ No

If yes, how much time?
☐ Unknown ☐ Less than 1 hour ☐ 1 hour ☐ 2 hours ☐ 3 or more hours Exact Value _____

Estimated cost of down time?
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value _____

Part H – Description of Damage

***Was there damage to a facility?**
☐ Yes ☐ No (i.e. near miss)

***Did the damage cause an interruption in service?**
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

If yes, duration of interruption
☐ Unknown ☐ Less than 1 hour ☐ 1 to 2 hrs ☐ 2 to 4 hrs ☐ 4 to 8 hrs ☐ 8 to 12 hrs ☐ 12 to 24 hrs
☐ 1 to 2 days ☐ 2 to 3 days ☐ 3 or more days ☐ Data Not Collected Exact Value _____

Approximately how many customers were affected?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 10 ☐ 11 to 50 ☐ 51 or more Exact Value _____

Estimated cost of damage / repair/restoration
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value _____

Number of people injured
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Number of fatalities
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

*Part I – Description of the Root Cause *Please choose one

One-Call Notification Practices Not Sufficient
☐ No notification made to the One-Call Center
☐ Notification to one-call center made, but not sufficient
☐ Wrong information provided to One Call Center

Excavation Practices Not Sufficient
☐ Failure to maintain marks
☐ Failure to support exposed facilities
☐ Failure to use hand tools where required
☐ Failure to test-hole (pot-hole)
☐ Improper backfilling practices
☐ Failure to maintain clearance
☐ Other insufficient excavation practices

Locating Practices Not Sufficient
☐ Facility could not be found or located
☐ Facility marking or location not sufficient
☐ Facility was not located or marked
☐ Incorrect facility records/maps

Miscellaneous Root Causes
☐ One-Call Center error
☐ Abandoned facility
☐ Deteriorated facility
☐ Previous damage
☐ Data Not Collected
☐ Other

Part J – Additional Comments

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APPENDIX C: GLOSSARY OF TERMS

Abandoned Line or Facility: Any underground or submerged line or facility no longer in use.

Alternate Locate Agreement (ALA): A contractual agreement between a facility owner and an excavator that allows the excavator to proceed with their excavation work without receiving a traditional field locate.

Backfill: The act of filling the void created by excavating or the material used to fill the void.

CCGA: The Canadian Common Ground Alliance's (CCGA) primary role is to manage damage prevention issues of national interest that Regional Partners consider best addressed through a single voice.

CGA: The Common Ground Alliance (CGA) is a member-driven association dedicated to ensuring public safety, environmental protection, and the integrity of services by promoting effective damage prevention practices.

Compliance: Adherence to acts and regulations.

Damage: Any impact, stress and/or exposure that results in the need to repair an underground facility due to a weakening or the partial or complete destruction of the facility, including, but not limited to, the protective coating, lateral support, cathodic protection or the housing for the line, device or facility.

Daylighting: The exposure of underground utility infrastructure by minimally intrusive excavation practices to ascertain precise horizontal and vertical position or other attributes. (Note: may also be referred to as "potholing" or "test pitting".)

Demolition Work: The intentional, partial or complete destruction by any means of a structure served by, or adjacent, to an underground line or facility.

DIRT: Damage Information Reporting Tool.

Downtime: Lost time reported by a stakeholder on the Damage Information Reporting Tool (DIRT) field form for an excavation project due to failure of one or more stakeholders to comply with applicable damage prevention regulations.

DQI: The Data Quality Index (DQI) is a measure of data quality and consists of the evaluation of each organization that submitted records, in addition to the evaluation of each record submitted to DIRT. Event: The occurrence of an underground infrastructure damage, near miss, or downtime.

Excavate or Excavation: An operation using equipment or explosives to move earth, rock or other material below existing grade. (Note: Excavation can include augering, blasting, boring, coring, digging, ditching, dredging, drilling, driving-in, grading, plowing-in, pulling-in, ripping, scraping, trenching and vacuuming).

Excavator: Any person proposing to or engaging in excavation or demolition work for themselves or for another person.

Facility: See Utility Infrastructure.

Facility Owner/Operator: Any person, utility, municipality, authority, political subdivision, or other person or entity who owns, operates, or controls the operation of an underground line/facility.

Grade (noun): The surface elevation.

Grade (verb): The act of changing the surface elevation.

Joint Trench: A trench containing two or more underground infrastructures that are buried together by design or agreement.

Locate (noun): The provision of location information by an underground facility owner (or their agent) in the form of ground surface markings and/or facility location documentation, such as drawings, mapping, numeric description or other written documentation.

Locate (verb): The process of an underground plant owner/operator or their agent providing information to an excavator which enables them to determine the location of a facility.

Locate Request: A communication between an excavator and the facility owner/operator or their agent (usually the One Call Centre) in which a request for locating underground facilities is processed.

Locator: A person whose job is to locate underground infrastructure.

Near Miss: An event where damage did not occur, but a clear potential for damage was identified.

Notifications: Ticket data transmitted to underground infrastructure owners.

One Call Centre: A system which provides a single point of contact to notify facility owners/operators of proposed excavation activities.

ORCGA: The Ontario Regional Common Ground Alliance (ORCGA) is a Regional Partner of both the Common Ground Alliance (CGA) and the Canadian Common Ground Alliance (CCGA). It is a non-profit organization promoting efficient and effective damage prevention for Ontario's vital underground infrastructure.

Person: Any individual or legal entity, public or private.

Public: The general population or community at large.

Root Cause: The primary reason an event occurred.

Test Hole(s): Exposure of a facility by safe excavation practices used to ascertain the precise horizontal and vertical position of underground lines or facilities.

Ticket: All data required from an excavator to transmit a valid notification to the underground infrastructure owner.

Ticket number: A unique identification number assigned by the one call center to each locate request.

Tolerance Zone: The space in which a line or facility is located and in which special care is to be taken.

Underground: Beneath the ground surface or submerged, including where exposed by temporary excavation.

Utility Infrastructure: a cable, line, pipe, conduit, or structure used to gather, store, or convey products or services. (Note: may also be referred toas "facility" or "plant".)

Vacuum Excavation: A means of soil extraction through vacuum where water or air jet devices are commonly used for breaking the ground.

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