

Understanding TransCanada PipeLines

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TRANSCANADA PIPELINES is an interprovincial gas transmission company operating over 4,500 kilometres of pipeline right-of-way from the Alberta-Saskatchewan border to Quebec with several branch lines along the way. The TransCanada right-of-way in Ontario passes through

numerous townships, towns, cities and municipalities. Consequently, many surveyors have performed or will perform surveys that will affect or be affected by the TransCanada easement.

This article is written to make you more aware of the unusual situations and problems that can be expected

when surveying in the vicinity of the TransCanada right-of-way. We hope to make your job easier and eliminate some of the problems and misconceptions that have occurred in the past. An increased awareness of the existence and nature of the pipeline will help to ensure that we continue to operate our pipeline facilities safely, reliably and efficiently.



TransCanada PipeLines

Association of Ontario Land Surveyors
1043 McNicoll Avenue
Scarborough
Ontario M1W 3W6

Attention: L. Petzold, O.L.S., Executive Director

Gentlemen:

Attached is an article I have written which I would like to have published in "The Ontario Land Surveyor".

Every once in a while we at TransCanada PipeLines become aware of situations where conflicts arise between our pipeline and the actions of Surveyors. Needless to say, such conflicts have the potential to become explosive and/or fatal. The pipeline contains natural gas operating at pressures approaching 1000 psi.

One recent case occurred when a Surveyor, working for a private landowner, established our pipeline right-of-way by using a bearing that was incorrect. The landowner proceeded to excavate a hole for his new house footings based on the surveyor's plan and bars. One thing led to another and it ended up the hole was dug well into our easement, to within two feet of our pipeline. It was strictly a matter of luck that the pipe was not hit.

The most recent case occurred in November 1988 along our pipeline that runs from Toronto to Niagara Falls. This pipeline passes through some areas in Brampton and Mississauga which are currently experiencing rapid subdivision growth. In this case, a Surveyor set monuments along the line which was described in our easement document - the centreline of the pipe.

One S.I.B. scratched the side of the pipe thereby necessitating TransCanada to make repairs. Another short S.I.B. was found to be directly over the centre of the pipe. Fortunately the pipe was 3-4 feet below grade at this location. I don't know if the force of a sledge hammer would be enough to drive a hole through the pipe in most cases, but there are circumstances that would tend to increase such a possibility. I do know that a bulldozer would have enough weight to complete the job if it happened to pass over the bar sometime later during subdivision or pipeline construction.

It scares us to think that there are similar situations occurring along our system of which we are not aware.

We hope that the publication of this article will improve Surveyors' awareness of our pipeline and the hazards which can develop when surveying around it.

Yours truly,
TransCanada PipeLines,
B. R. Bailey,
Assistant Supervisor, Surveys,
Pipeline Design.

Original Surveys

The legal survey of the original TransCanada right-of-way was performed after the pipeline was constructed in 1957/58. From Kenora to Toronto the limits of our easement were established 25 feet and 40 feet to the left and right of the centreline of pipe. This configuration is shown on each of the survey plans and is in accordance with the description of our easement rights in our Grant of Easements documents. The centreline of the right-of-way was established as the "monumented" survey line. Subsequent surveys over the years have proven that the 25'-40' relationship to the pipeline was not always achieved. We have found numerous locations where there are shifts of up to 10 feet. There are many reasons for the non-conformity, but as you know, locating buried utilities is not an exact science, particularly when it comes to large diameter pipelines. We must also keep in mind that the 25'-40' relationship was for the original pipe in its original position. Over the years, TransCanada has removed portions of the original pipe and replaced it with pipe in a parallel ditch (usually 10 feet away). For these reasons the 25'-40' relationship does not always hold true.

To make matters even more confusing, there is often a clause in the Grant of Easement that states if a legal survey plan is registered in the future, then the location of the easement will be as defined on the new plan. Unfortunately, over the years many of the survey bars shown on the plans have been destroyed by subsequent construction and other activities along the right-of-way. How do you re-establish these "lost" limits? A typical attempt to re-establish the easement might go something like this. As expected, Murphy's Law takes effect and when the ties to lot corners are laid

out you find that our second pipeline lies outside the easement limits. It isn't supposed to! So then you set up the 25'-40' relationship to the pipeline - but unknown to you the pipe was replaced a couple of years back! Of course you would not necessarily know about our second pipeline being there or the fact that the original line was moved. What you do know is the right-of-way is overgrown with scrub brush, the nearest monuments on the "monumented" line are kilometres away and your client does not want to pay the thousands of dollars it is going to cost to re-establish the TransCanada right-of-way.

Protecting Monuments

Long ago TransCanada recognized the need to ensure survey bars remain in place as long as possible. For this reason, the Company has insisted that full length S.I.B.s be used as monuments, where the depth of overburden permits. We have also specified that in areas of soil the bars be buried at least 0.3 metres below grade. This helps protect the monuments from various activities that are conducted along the right-of-way in the course of constructing, maintaining and operating the pipeline system. In cultivated land it also serves to protect them from associated farming activities. It is amazing that a large number of buried bars still manage to get bent. This can likely be attributed to the current pipeline practice of removing top soil prior to construction. The topsoil which protected the bars is returned but not until after the damage is done.

Many surveyors wonder why we bury bars set at fences which cross the right-of-way. The answer: the fences are removed during construction! Quite often the bars are set some distance away from the fence. This allows for easier detection, without interference from the fence wires. It is a recognized fact that the buried bars are harder to find but it is a comfort to know that at least they have a chance of surviving.

Needless to say, an electronic metal detector is an absolute necessity if you are looking for "pipeline" bars.

We'd appreciate your cooperation in filling in the holes made when uncovering the buried bars in our easement. We have had numerous complaints from landowners that these holes are a hazard for their farm animals.

When we work on a new or existing pipeline in our easement we frequently negotiate a temporary easement from the landowner for what we call "working room". This working room is not usually

wider than 30 metres except at road crossings where it can be 50 metres wide. The "working room" can be located on either side of the right-of-way. Any monuments set in this area are susceptible to damage from construction activity.

Monument Replenishment

In 1978 we instituted a policy of replacing any survey bars that we damage during a construction project. This has helped improve the situation significantly. Since 1978 pipeline construction projects have taken place primarily at road crossings and in areas where there is increasing residential development. This survey bar replacement practice, together with the recent easement survey for the Bell Canada fibre optic cable, means you are more likely to find undamaged survey bars along the pipeline right-of-way. However, various activities along the easement by TransCanada, the landowner, Bell Canada and others, continue to put the bars in jeopardy. This is a fact of life.

During our preparations to replace damaged bars after a construction project, we occasionally set witness monuments off to the side. You may come across such monuments. They are sometimes set on the limit of the easement or at some convenient distance from the monumented line. Although they will not show up on any survey plan, the surveyor who set them and we at TransCanada, will have field notes which show the details of the survey. If you are having trouble finding bars on the "monumented" centreline, it may be worthwhile to check around the limits.

Pipeline Variables

In addition to the fact that any bars set within or near the TransCanada right-of-way are susceptible to damage, it is also dangerous to set monuments near high pressure pipelines. The number of pipelines within our right-of-way varies. Even though our original easement survey plans show the existence of one pipe, there may be two or three there now. Our pipelines can vary in size from 6 inches to 48 inches, their position within the easement can change and their depth below ground level can change from 40 feet deep to being exposed. Our pipeline contains highly flammable natural gas at pressures that can reach up to 1000 pounds per square inch. Whenever possible you should refrain from setting bars within our easement. For example, you should not design a Plan of Subdivision that calls for a road to bend somewhere near the

pipeline right-of-way or for lot corners to fall within the right-of-way. We have seen such designs and shudder to think that some survey crews have gone out and driven a 4 foot SIB into the top of a pipeline. Monuments should not be set within (or near) the TransCanada right-of-way unless the pipelines have been properly located by one of our inspectors. Remember, TransCanada may need to move the pipe sometime later and an unsuspecting survey may try to reset the bar without realizing the pipe is directly below. The pipeline warning markers located at roads and fencelines provide the phone number of the local TransCanada office. Please call before you set any bars near the right-of-way (even on the limit). Keep in mind that the pipeline warning markers you see along the right-of-way are usually **not** set directly above the pipe and "limit" markers are only intended to show the approximate limits.

In addition to pipelines, we have also installed buried electrical cables within the easement at many locations. These cables form part of the cathodic protection system to reduce corrosion of the pipelines. It could be dangerous and/or costly if the cables are hit by a survey bar. Our message can be summed up with one statement - "Setting survey bars near or within the TransCanada right-of-way calls for extreme caution."

Locating Buried Pipelines

You can buy many types of electronic pipe and cable locators or metal detectors. These instruments range in value from a couple of hundred dollars up to ten thousand dollars. Some instruments work better than others depending on the location and ground conditions. No instrument used to locate buried utilities of any type should be considered infallible. When locating large diameter, high pressure natural gas pipelines, mistakes can be fatal. Generally speaking we discourage the practice of using metal detectors to accurately locate our buried facilities. Instead we require the use of instruments which are capable of transmitting a signal along the pipe.

Easements and Plans

A less serious problem we've found over the years are instances where we have failed to obtain an easement for our second pipeline even though we have survey plans (Reference Plans) which illustrate a continuous strip of additional easement. It is rare but it does occur and should you discover any such occurrences we would appreciate the information.

At the opposite end of the scale, there are locations where we have properly registered easement documents that describe our easement by metes and bounds but there are no pipeline survey plans **registered** against the title. In particular, this occurs on a section of our pipeline system between Toronto and Niagara Falls. In all likelihood, we have **unregistered** plans for the easement in these locations. We will make these plans available to you if you are in the vicinity. Over the next couple of years, we will try to have these plans updated and deposited in the local Land Registration system. In the meantime, we have reproducible copies in our office and can provide you with prints at your request.

Avoiding Conflicts

If a Plan of Subdivision or a plan for a Land Titles first application is submitted for approval and the TransCanada right-of-way is part of the property, we are asked to review the plan and comment. Among other things, one of our major concerns is whether or not the easement has been accurately re-traced and shown on the plan. Far too often we see that the TransCanada sur-

vey bars were not used to establish the easement limits. For various reasons, many surveyors choose to use such evidence as lot corner ties. We have learned that when the original pipeline legal survey was performed, the emphasis was placed primarily on the measurements along the monumented line. Due to various restraints placed on the surveys at that time such as economic and time, the effort spent establishing adjacent property lines and lot corners was not as extensive as it would be today. Consequently we've learned not to place too much trust in the lot-corner ties shown on the older plans. We find that if you go far enough back along the right-of-way, you get better results using the monuments and plan dimensions along the monumented survey line. We've seen lot-corner ties that were out by hundreds of feet and others that were out by 10 feet - either of which is enough to mean the pipeline would be outside the easement. If the plan doesn't indicate that you found and used the survey bars along the easement, we have no choice but to respond accordingly to the appropriate authority - which may cause delays in the plan approval process.

Conclusion

We want to apologize if this article seems overly negative, it was not meant to be. Over the years, we've enjoyed a very cooperative relationship with all members of your Association and we hope to continue to do so in the future.

With increasing activity in and around our pipeline right-of-way every year, there is a potential that dangerous situations will occur more frequently. It is in all of our best interests to do our part to eliminate such problems whenever we can. Although we have a very limited number of survey staff at TransCanada we are happy to offer our assistance to you, whenever we are available, if you have any trouble finding our bars or establishing our easement. After surveying our easement over and over again, our field staff can quite often remember exactly where the monuments are and can assist you to find them. We can also provide valuable historic information about any particular location.

If we can give you any further information regarding the TransCanada PipeLines System, please feel free to contact us at any time. You can phone the writer at (416) 869-2437. ●