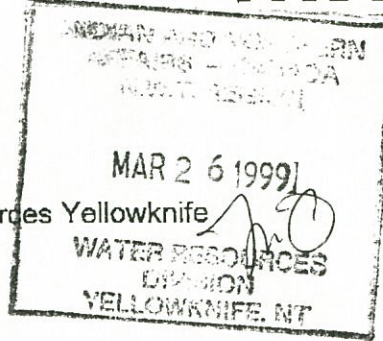




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FACSIMILE



Inuvik Dist.

To: **Sevn Bohnet**
Company: DIAND – Water Resources Yellowknife
Phone: (867) 669-2696
Fax: (867) 669-2716

From: **James C. McDougall, P.Eng.**
Date: March 26, 1999
Pages: 11 Including this cover page
Subject: **Water Board License N3L1-1727 Abandonment and Restoration Plan**

- Urgent Information For Review For Comment Please Reply

Comments:

Dear Sir:

This fax outlines the Abandonment and Restoration Plans for this winters construction activities associated with the Town of Inuvik Gas Project as required under Part H of License Number N3L1-1727.

Restoration of Temporary Access Roads

Snow / ice pads were constructed on all temporary access roads to protect the underlying permafrost. These snow / ice pads will be allowed to melt in place. If there are areas along the temporary access roads where the snow / ice pads may impede cross drainage then they will be notched before spring break up to facilitate natural flow.

ROW Restoration

As shown in Figure 1, a snow / ice pad was constructed on the east side of the right-of-way to provide a working surface for vehicular movement. The snow / ice pad will be allowed to melt in place. There are a number of locations along the ROW where the snow / ice pad may impede cross drainage. In these locations the snow / ice pad will be notched in a manner so as to protect the permafrost before spring break up to facilitate natural water flow. If ponding becomes evident during spring break-up, personnel will be dispatched by snow machine or helicopter to rectify the problem area.

March 26, 1999

Water Intake facilities

Water was drawn from a number of lakes along the ROW as described in the Water Board application to ice down the snow pad to yield a working surface that would accommodate construction traffic and protect the underlying permafrost. The water was pumped from the lakes using portable pumps that were equipped with intake screens. These portable pumps have been removed.

Pipeline Ditch Restoration

As shown in Figure 2, the majority of the 50 km 6 inch pipeline was laid in a 15 inch wide ditch that is 1.3 meters deep. The pipe was then covered with 2 feet of sand and the native soil was then placed in the ditch with the excess material roached over ditch. Thaw strain analysis of the native ditch material shows that there will be approximately 50% settlement in the native material when it thaws next summer which will result in a ditch profile similar to that shown in Figure 3a. The restoration plan is to rake or shovel the excess material from the thawed roach on either side of the ditch into the ditch, thus bringing the ditch to grade (Figure 3b). The ditch will then be monitored until the following summer when it will be re-seeded with indigenous grasses if necessary.

Sand padding was not initially available for the first seven kilometers of the ditching and backfilling operation. As a result native material was placed on top of the pipe, and then sand was roached over the ditch line as shown in Figure 4. As described above, we expect about 50% settlement in the native material when it thaws next summer. For this section of line we will be raking a mixture of sand and native silt into the ditch to bring the ditch to grade (Figure 5). The ditch will be monitored until the following summer when it will be re-seeded with indigenous grasses if necessary.

There were a number of localized areas where the trencher could not be used due to the presence of cobbles and boulders. In these areas a backhoe with a 24 inch bucket was used to excavate the ditch. After the pipe was laid, it was backfilled in the manner described above.

Stream Crossing Restoration

The pipeline crosses a total of 15 very small streams, all of which were not flowing during construction. The ditcher or backhoe was used to cut a trench across the streams as shown in Figure 6. After the pipeline was laid, sand was placed on top of the pipe and then native material packed on top of the sand to bring the ditch to surface. Excess material was not roached on top of the ditch as described above. The restoration plan for stream crossings is to ensure that the snow / ice pad on the working side of the ROW is notched or removed before spring break up in order not to impede natural flow. A load of clean coarse gravel will be placed on either side of the stream so that it can be placed on top of the ditch if necessary to prevent any erosion of the ditch material that may cause siltation of the stream. Straw bails will also be placed along either side of the stream above high water, to prevent water from flowing along the ditch and into the stream. This should also mitigate siltation of the stream. This summer efforts will be made to restore the channel and bed of the stream to their original alignment and cross-section.

March 26, 1999

The pipeline is above ground over Douglas Creek. Therefore very little restoration, if any will be required, except for the removal of the temporary bridges that have been placed to support the construction of the pipeline. These bridges will be removed prior to spring break up.

Camp Restoration

Both the Ikhil camp and the Douglas Creek camp will be demobilized prior to spring break up. The Douglas Creek camp is sitting on sleepers, which will be removed. The Ikhil camp is sitting on wooden piles, which will be cut off at ground surface.

There are two sewage sumps, one at the Douglas Creek camp and the other at the Ikhil camp. As shown in Figure 7 both sumps will be capped with native material and seeded next summer with an indigenous seed mixture. The Ikhil camp sump will be capped with granular material that has been stockpiled nearby prior to capping with native material.

Well completion fluids

All well completion fluids used in this winter's completion programs for Ikhil K-35 and J-35 were trucked to Fort Nelson for disposal. There were no drilling sumps associated with this winter's completion programs and thus there are no associated restoration requirements.

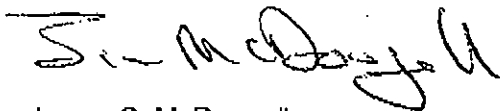
Pipeline Pressure Testing Fluids

Air will be used to test 49 kilometers of the 50-kilometer pipeline. A mixture of water and methanol will be used to test the above ground gathering system at Ikhil and the above ground section of the pipeline across Douglas Creek. The methanol water mixture will be trucked to Fort Nelson for disposal.

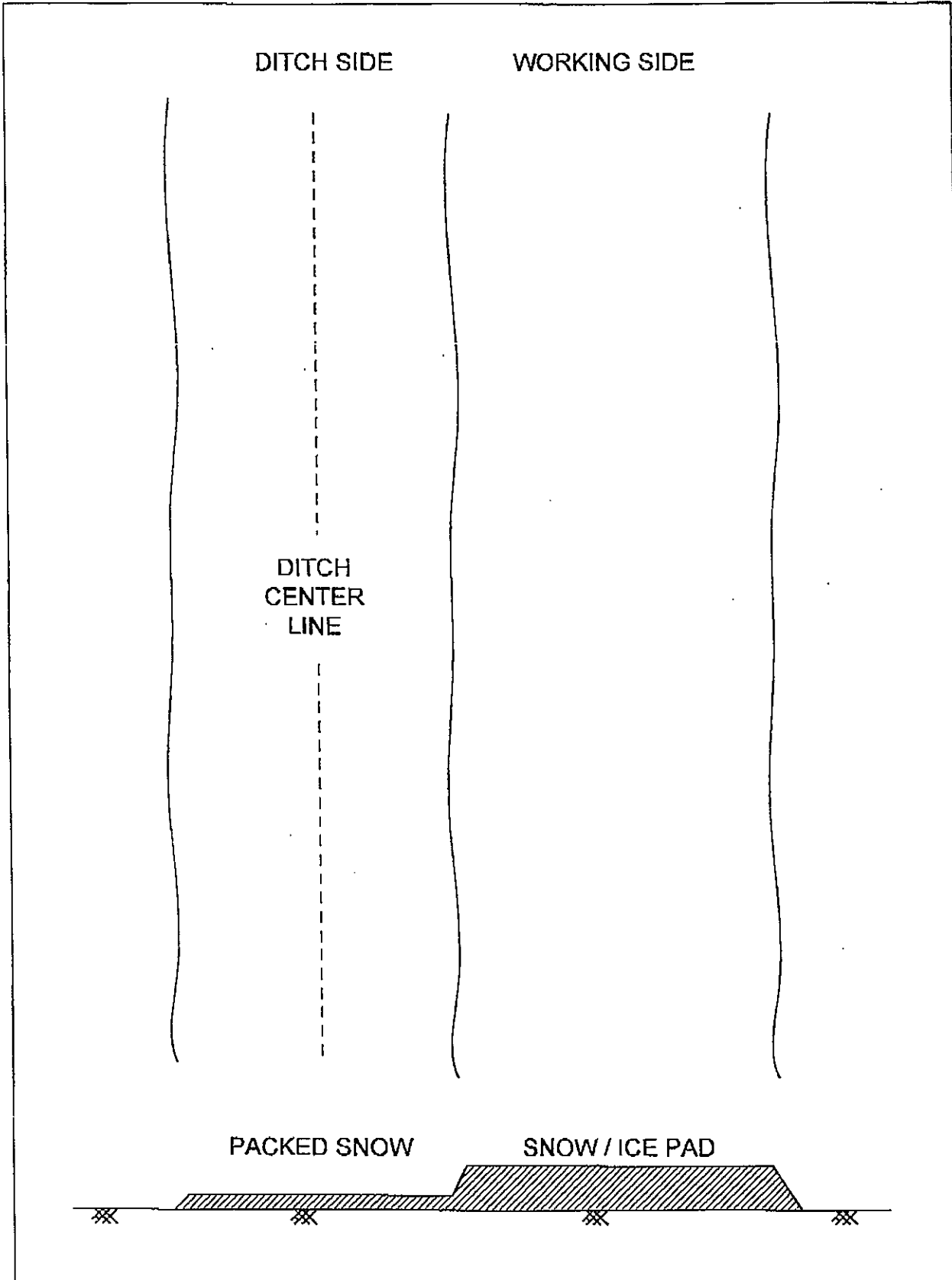
Restoration Schedule


The proposed restoration schedule is shown in Figure 8. Cleanup and restoration will commence March 20, 1999 and be complete on April 10 prior to spring breakup. Ditch restoration will take place in late July or early August when the material has had an opportunity to thaw and settle using local labor with hand equipment and possibly a low ground pressure type of Bobcat (if approved by the Inuvialuit Land Administration). Final seeding of the ditch will take place the following summer if it is required.

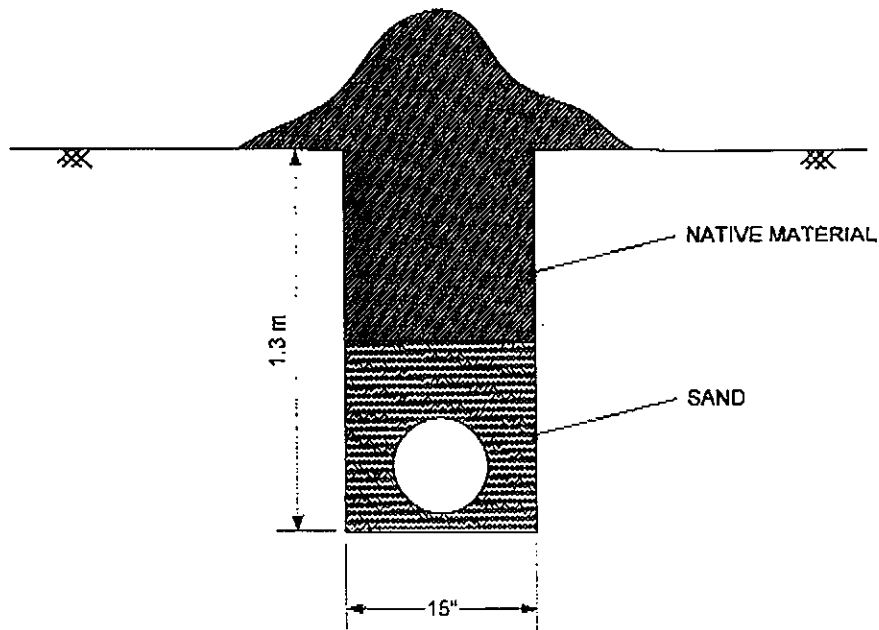
Sincerely,



James C. McDougall P.Eng.
President



<p>N</p>  <p>60</p>	<p>North of 60 Engineering Ltd. 2050, 140 4th Avenue S.W. Calgary, Alberta, Canada T2P 3N3</p>		<p>Figure 1 - Snow / Ice Pad</p>	
	<p>By: CWT</p>	<p>Date: 99/03/11</p>		
	<p>Scale: NTS</p>			



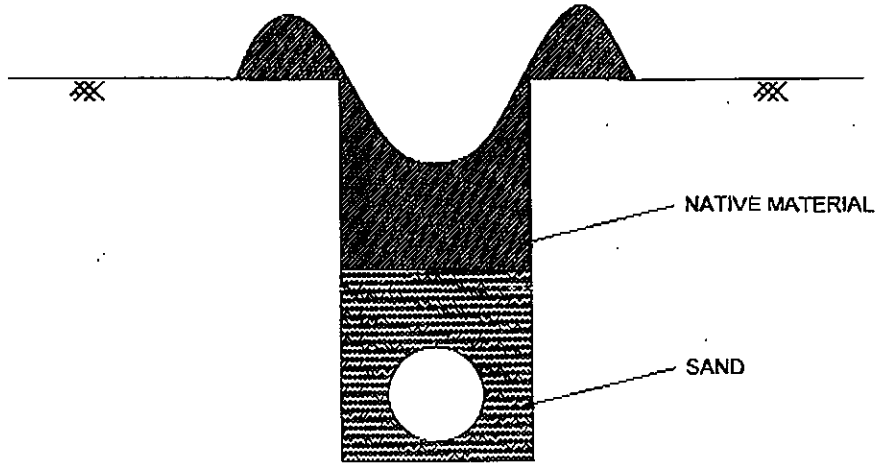
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Figure 2 - Ditch Backfill

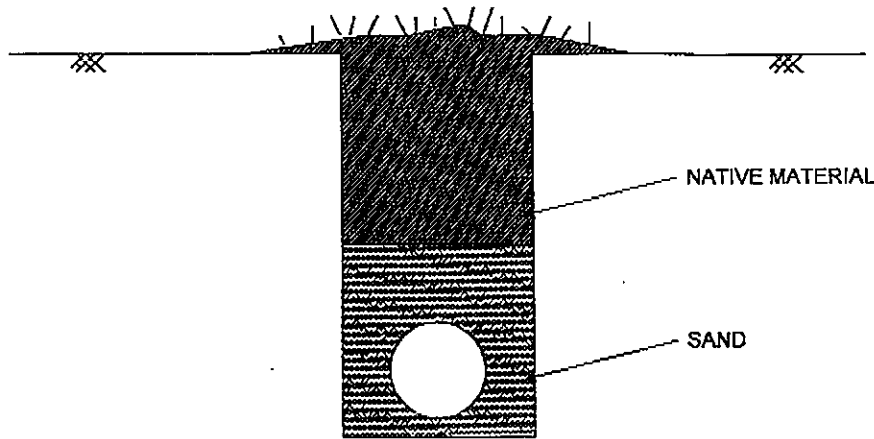
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(a) - After First Thaw



(b) - After Restoration



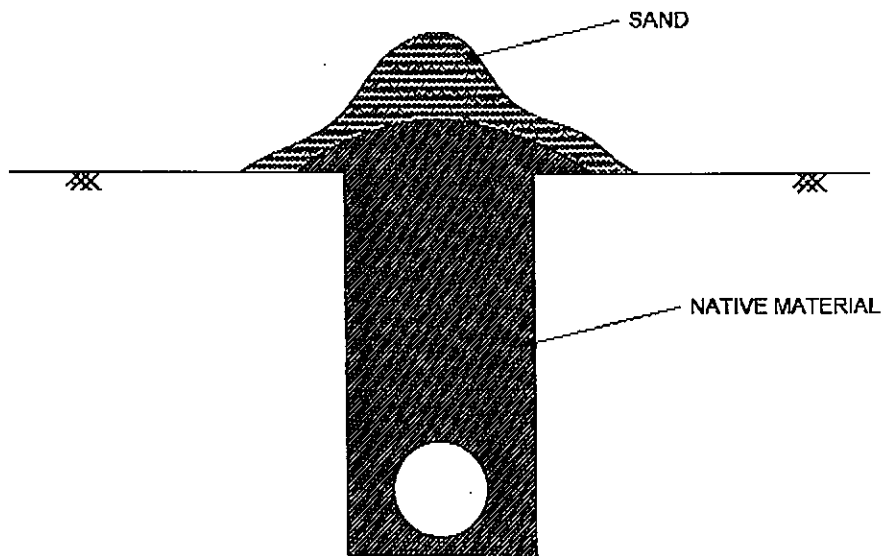
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Figure 3 - Ditch Backfill After Construction

By: CWT

Date: 99/03/11

Scale: NTS



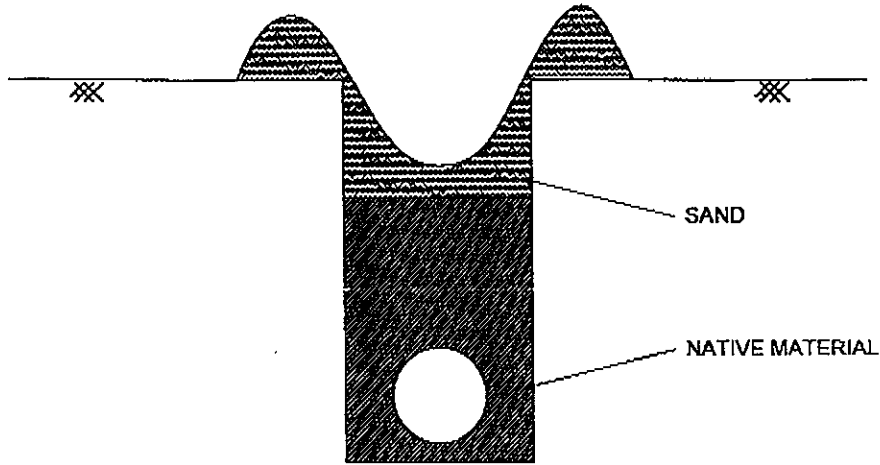
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Figure 4 - Ditch Backfill - Sand Roach

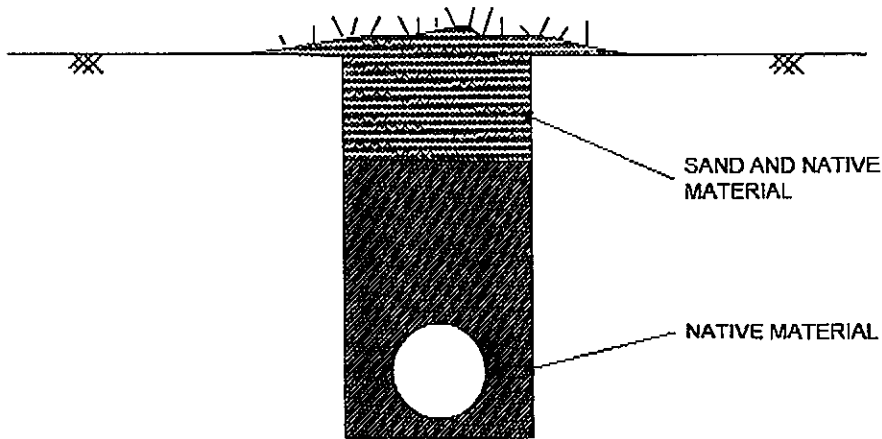
By: CWT

Date: 99/03/11

Scale: NTS



(a) - After First Thaw



(b) - After Restoration



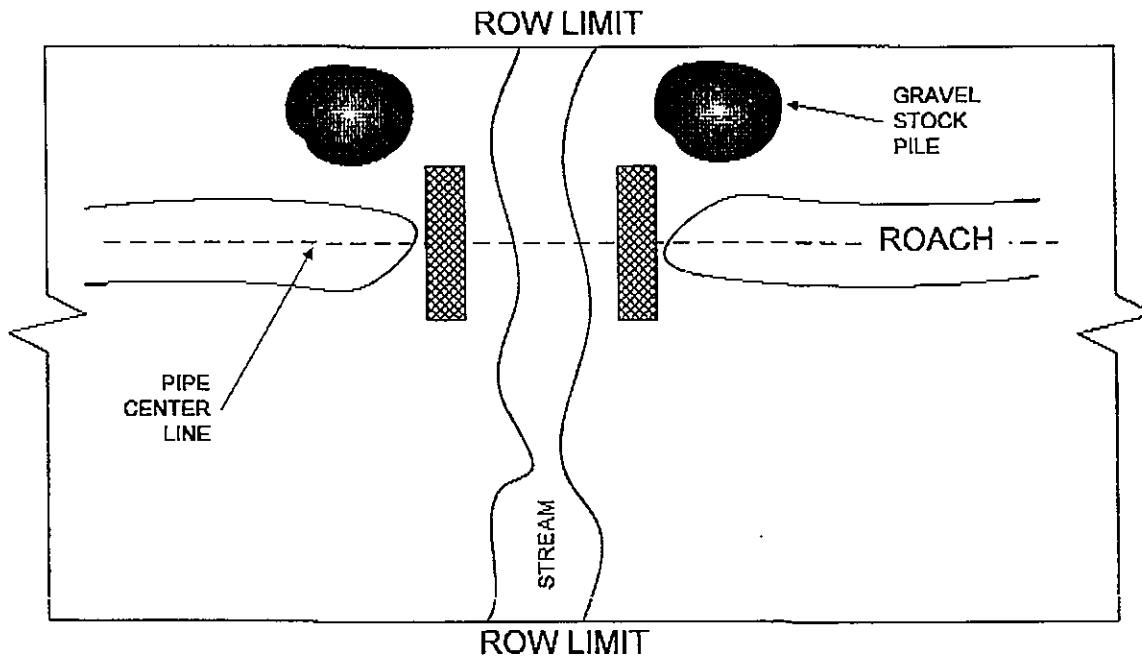
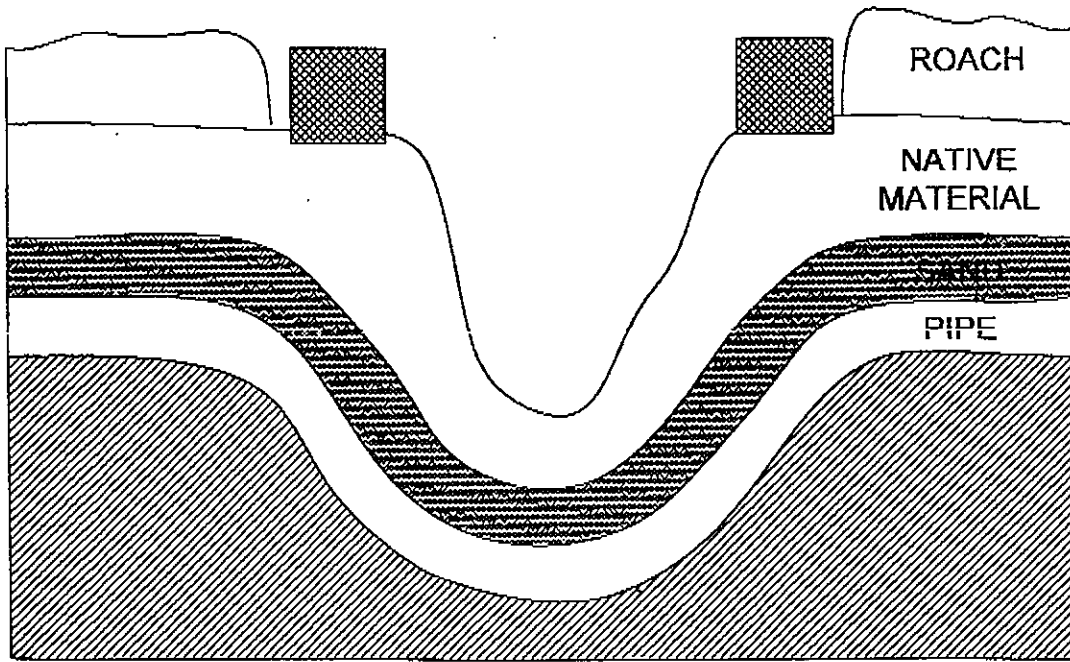
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Figure 5 - Sand Roach After Construction

By: CWT

Date: 99/03/11

Scale: NTS



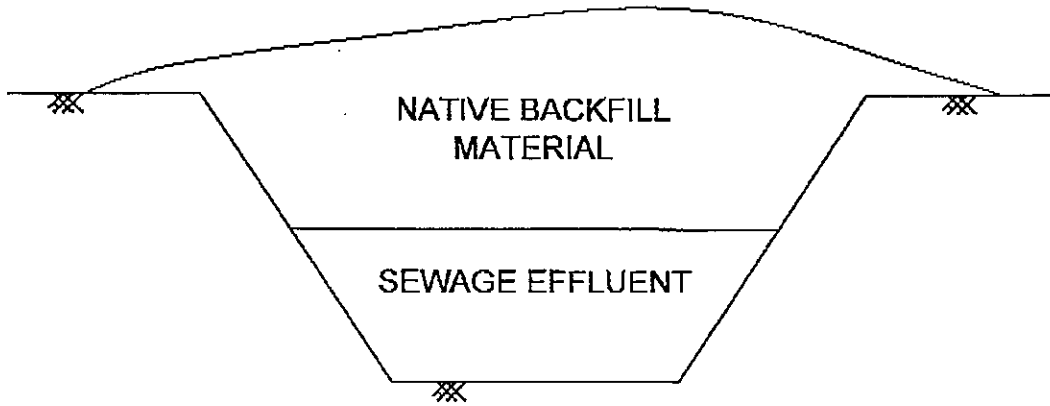
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Figure 6 - Ditch at Stream Crossing

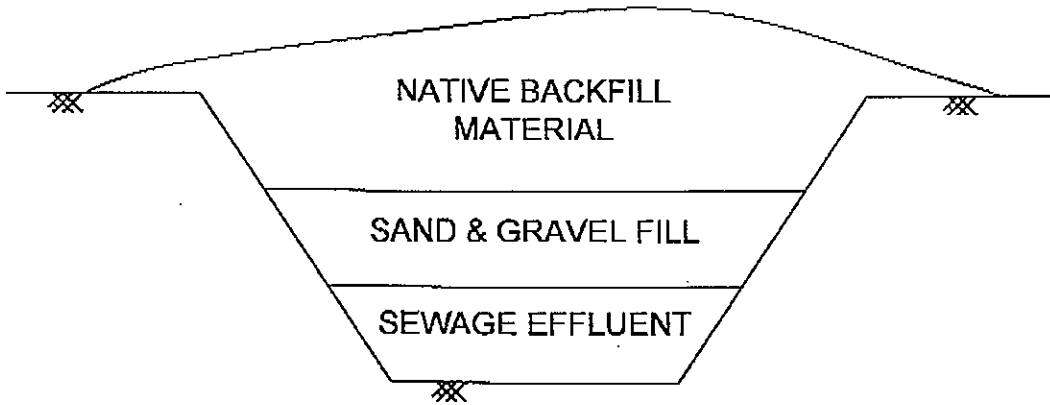
By: CWT

Date: 99/03/11

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Douglas Creek Sump



Ikhil Sump



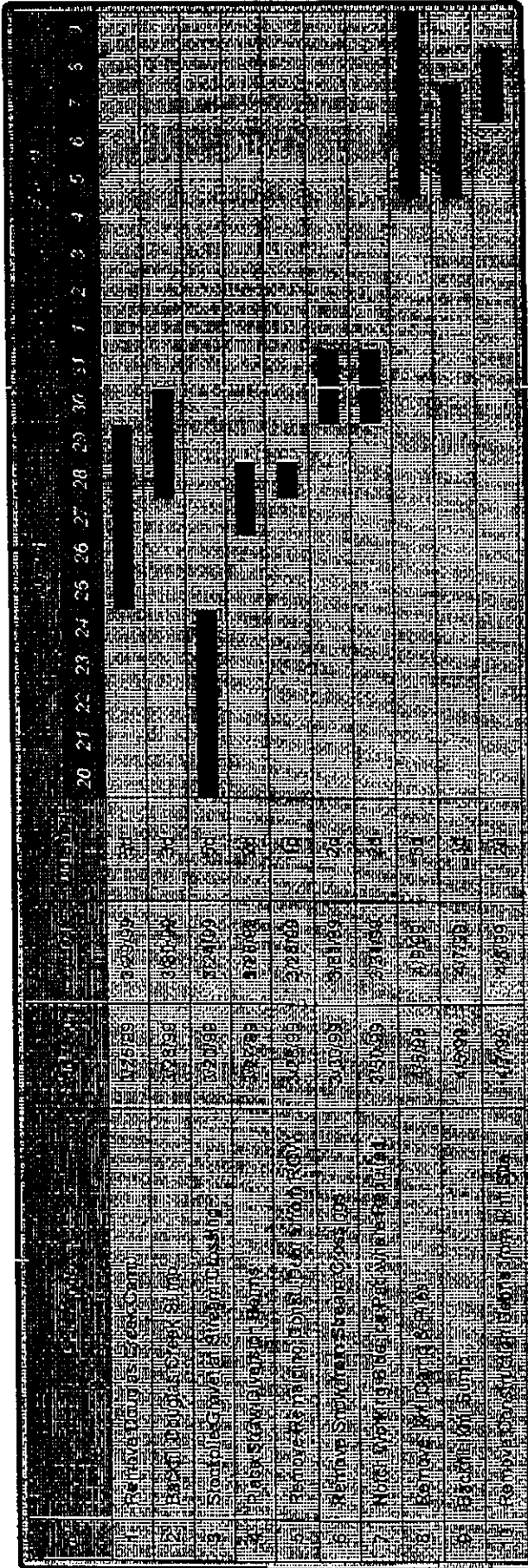
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Figure 7 - Sump

By: CWT

Date: 99/03/11

Scale: NTS



Project: Inuvik Gas Project			
Proj #: 9808	Revision: 0	Dwg #: 9808-9901	Page 1 of 1
By: JCM	Date: 990311	Scale: N.T.S.	

**Town of Inuvik Gas Project
Restoration Schedule
Figure 8**

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