SCOPING OF THE INUVIALUIT SETTLEMENT REGION

GRANULAR RESOURCES DEMAND SURVEY

March 2007

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Department of Indian and Northern Development

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1 EXECUTIVE SUMMARY

This report summarizes the review of previous granular demand forecasts for the Inuvialuit Settlement Region. A preferred methodology required for the completion of a new forecast is presented, including a list of contacts for granular demand information and a survey template.

2 BACKGROUND

2.1 Land and Granular Resource Ownership

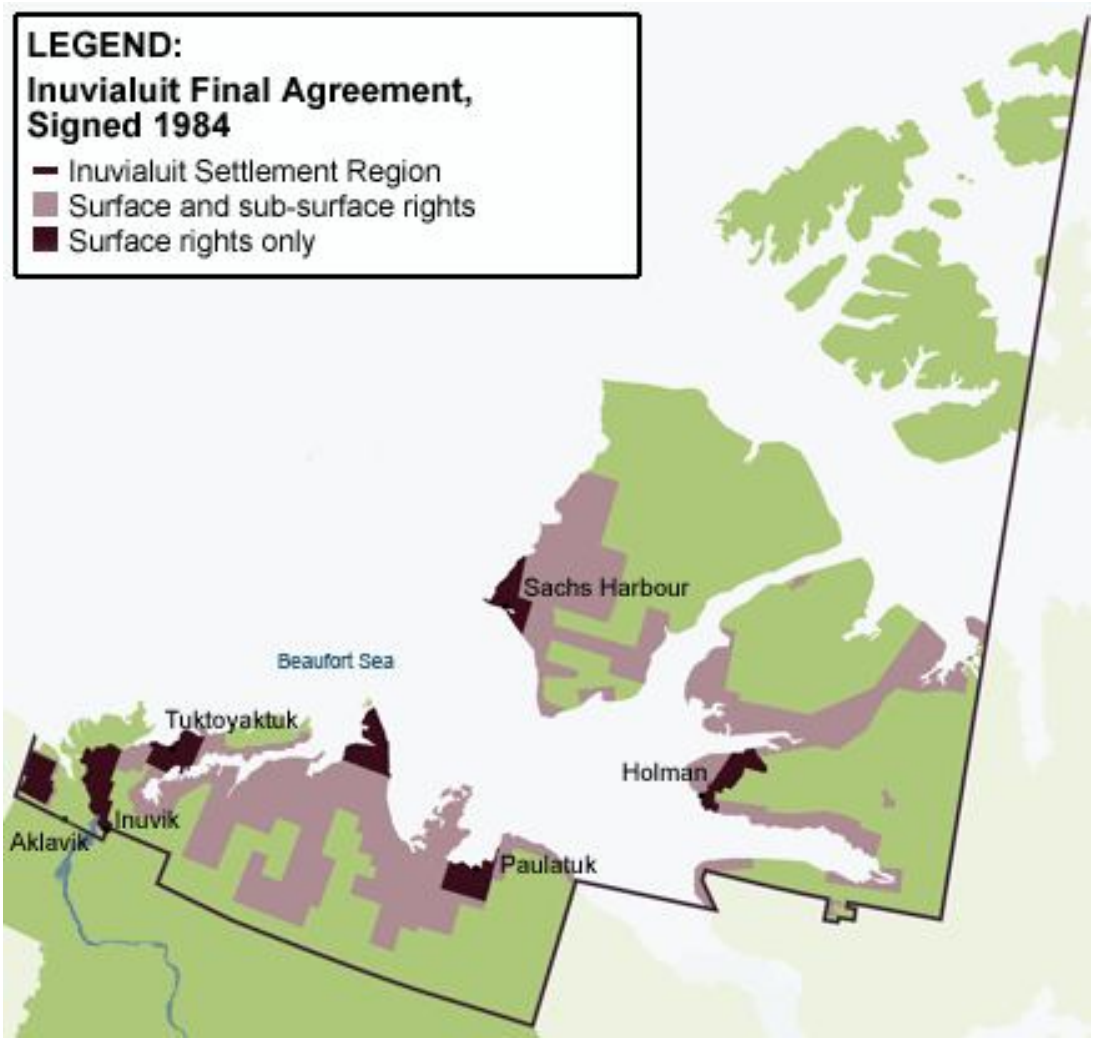
Historically, ownership of land in the Western Arctic was for the most part held by the Crown and was administered by the Department of Indian and Northern Development (DIAND). The Crown transferred title to certain lands to the Inuvialuit with the conclusion of the Inuvialuit Final Agreement (IFA) in 1984. Under the IFA the Inuvialuit were granted surface and subsurface rights to 13,000 sq km and surface rights to 78,000 sq km in what is now known as the Inuvialuit Settlement Region (ISR). The total area of the ISR is 450,000 sq km extending from the western Arctic coast from the Alaskan border to the Amundsen Gulf, and extending into the Beaufort Sea to include Banks Island, part of Victoria Island and part of the Western Queen Elizabeth Islands. See Figure 1. The Crown retains the remaining land in the ISR (about 80%), with Commissioner's land and Municipal Lands making up a small percentage as well. The IFA applies to the six Inuvialuit communities of Aklavik, Holman, Inuvik, Paulatuk, Sachs Harbour, and Tuktoyaktuk.

Figure 1. Inuvialuit Settlement Region

The IFA transferred title and rights to specific blocks of land to the Inuvialuit. In the IFA section 7(1)(a) refers to those lands where the Inuvialuit have both surface and subsurface rights. Section 7(1)(b) refers to those lands with surface rights only. Subsurface rights were granted for oil, gas, other hydrocarbons, coal, sulphur, minerals and granular materials. Surface rights were granted for granular materials only. The federal government holds subsurface title to all resources, except granular materials, on those lands where only surface rights are held by the Inuvialuit.

In general, these lands are referred to as "7(1)(a)" or "7(1)(b)" lands, or "Inuvialuit private lands". See Figure 2 for locations. The responsibility for managing the Inuvialuit private lands was devolved to the Inuvialuit Land Administration (ILA), based in Tuktoyaktuk. There are approximately 13,000 sq km of 7(1)(a) lands which include blocks of 1,800 sq km near each of the six communities. The 7(1)(b) lands include approximately 78,000 sq km. DIAND issues sub-surface rights on 7(1)(b) lands, and on Crown land, including Commissioner's Lands.

Figure 2. Inuvialuit Lands



The Inuvialuit also hold rights to 7(2) lands which contain the beds of all lakes, rivers and other water bodies found within Inuvialuit-owned 7(1)(a) and 7(1)(b) lands. Surface rights for these lands are held by the Inuvialuit. Sub-surface rights are held either by the Crown where the water body is within 7(1)(b) lands or by the Inuvialuit where the water body is within 7(1)(a) lands.

Presently the Government of the Northwest Territories (GNWT) has acquired limited control of surface rights for some lands within the ISR. Administration and control of these surface rights has been transferred to the Commissioner of the Northwest Territories and are referred to as Commissioner's Lands. Commissioner's Lands within the ISR are inside the municipal boundaries of all the Inuvialuit communities with the exception of Inuvik, which has Commissioner's Lands outside of municipal boundaries. Within the GNWT the Department of Municipal and Community Affairs (MACA) manages Commissioner's lands. MACA issues rights such as Land Use Permits and Quarry Permits for activities that are not on Commissioner's Lands, but are within municipal boundaries. Sub-surface rights are still under the jurisdiction and control of the Crown.

Municipal lands are administered by the GNWT or the municipality.

2.2 Granular Resource Management

In the ISR the management of granular resources is generally divided between the two major Land Managers, either the ILA in the case of the Inuvialuit privately owned lands, or DIAND in the case of Crown lands.

The ILA's responsibility to administer Inuvialuit lands covers all land uses, including granular material. The IFA specifically requires that reserves of granular material are maintained to meet 20 year forecasted demands. Therefore, the ILA has the responsibility to ensure adequate resources are available now and in the future. Similarly, DIAND has the responsibility for management of resources on Crown Lands in the ISR. In either case, granular material demands must be satisfied with established supply while also anticipating demand impacts due to large infrastructure projects. The challenge for land managers is that granular deposits are often inaccessible and non-renewable.

The most significant demand pressure is in the Mackenzie Delta Region where natural gas development is currently proceeding. The potential for construction of a natural gas pipeline through the region could result in conflicts for granular material between industrial needs and communities. In order to meet all current and future demands careful management of the resource is required and some priority must established on its usage.

2.3 Sand and Gravel Priorities

Under the IFA sand and gravel deposits on Inuvialuit-owned lands are managed under a system of use priorities which gives first priority to public community needs, second priority to the direct private and corporate needs of the Inuvialuit, and third priority to any project approved by an appropriate governmental agency. The public and private

community needs for sand and gravel are estimated based on a twenty-year forecast of requirements.

3 SCOPE

This report was prepared pursuant to Service Contract #A7133-06-0028 with Indian and Northern Affairs Canada. The departmental representative for this contract was Robert Gowan, Manager, Land Programs, INAC.

The following outlines the scope of this project:

- Review briefly all previous granular demand forecasts prepared as part of the implementation of the Inuvialuit Final Agreement (IFA) and other relevant forecasts for the ISR to determine the scope and methodology used in previous forecasts.
- Identify, from previous forecasts and though consultation with DIAND and the Inuvialuit Land Administration, potential sources of information on granular resource requirements
- Provide recommendations on a preferred methodology for obtaining the demand information needed to prepare a new granular resources demand forecast consistent with the requirements of the IFA.
- Prepare a survey template suitable for compiling the demand information required for the new granular resources demand forecast.
- Prepare a report that provides a brief summary of previous granular resources demand forecasts, identifies potential sources of information and methodology and includes an appropriate template for a new granular resources demand forecast.

4 SUMMARY OF PREVIOUS DEMAND FORECASTS

Since the implementation of the IFA in 1984 there have been four granular demand forecasts prepared for the ISR in the years 1987, 1991, 1995 and 2001. Each of these forecasts was prepared for a 20 year period.

4.1 1987 Forecast

The first demand forecast was completed in 1987 by EBA Engineering Consultants Ltd. and covered the 20 year period of 1987 to 2006. The scope of these reports included:

- Development of granular resource supply models for each of the six communities by examination of all existing reports describing granular material deposits.
- Development of a granular resource demand model for each community through consultation with private and public sector users.

- Development of a recommended resource development scenario for each community to ensure reserves are established according to the priorities outlined in the IFA.
- Preparation of appropriate development recommendations for those sources with the best development prospects.
- Development of a geotechnical data base consisting of historic borehole information from the study area.

In order to obtain granular demand information a questionnaire was sent to all levels of government and contractors that were potential users of granular material in the ISR. The questionnaire was used to determine volumes and grades of material required, as well as the most probable source of the material. The 20 year projection was presented in four blocks covering five years each. Following the distribution of the questionnaire EBA representatives made site visits to assess local conditions. Follow up phone calls were made to answer questions and obtain more detailed information. All collected data was entered into a database to facilitate the forecasting. A considerable component of these reports was the evaluation of granular supply and recommendations for development for specific deposits in an attempt to match existing supply with the projected demand for each community.

Demand of granular material was classified using the classification system developed by DIAND in 1983 whereby material is graded into one of five classifications based on the quality. The GNWT classification system was cross referenced to the DIAND system to provide for consistency. Furthermore, demand was categorized into the three broad areas of planned capital projects, speculative capital projects and maintenance requirements and presented as either “Public” or “Other”.

The total demand for all the ISR was forecast to be 17,400,000 m^3 of which 92% was for speculative projects, 5% for planned capital projects and 3% for general maintenance requirements.

4.2 1991 Forecast

In 1991 Hardy BBT Limited completed a granular resource demand summary of the Mackenzie Delta which updated some of the 1987 EBA forecast figures for the period of 1990 to 2009. This scope of this report included only the communities of Aklavik, Inuvik and Tuktoyaktuk and included the revision of only granular demand, not supply.

Prior to obtaining new granular demand information the previous EBA forecast figures were discussed during workshops held in the three communities in 1988. Any community concerns with the demand figures were noted at that time, but in general the figures were found to be acceptable. This forecast was generated using the 1987 EBA demand forecast and incorporating only new or changed projects to extend the time period to 2009.

Updated demand information was requested via a letter sent in March of 1990, with a second mailing and follow up phone calls four months later. The EBA demand figures from the previous forecast were included with the letter for reference in order to make adjustments. A very low response rate of 38% was achieved, primarily from the Oil and

Gas sector and the Federal Government. Therefore this demand forecast relied primarily on the previous EBA figures as they were presented in the forecast. The original raw survey data was not made available for this forecast.

Adjustments were made to the 1987 community demand tables by shifting the onshore oil and gas production demand from Tuktoyaktuk to Inuvik. It was felt that Inuvik was closer to where the proposed gas pipeline development would occur. This pipeline proposal was not considered at the time of the 1987 forecast.

The initial 1987 forecast was presented in five year periods. This forecast does not follow that format and no attempt was made to reconcile the time periods with the previous forecast, or to be consistent with the time periods that were used.

This forecast used the same classification and categorization of material as the 1987 report.

Overall demand for the 20 year period was forecasted to be approximately 26,000,000 m^3 for the three communities of Aklavik, Inuvik and Tuktoyaktuk. This is a considerable increase from the 1987 forecast.

4.3 1995 Forecast

In 1995 North of 60 Engineering Ltd. completed the third demand forecast for the period of 1995 to 2015.

The scope of this forecast was to:

- collect, review and consolidate information from previous forecasts as a starting point for creating the new short and long term forecasts,
- assist the Inuvialuit Land Administration to implement the “Granular Resource Demand Forecast Model” to capture historical usage and
- to develop both short term (5 year) and long term (20 year) granular demand forecasts for the Inuvialuit Settlement Region.

In 1994 North of 60 Engineering developed a “Granular Resource Demand Forecast Model”, which was a database designed to record depletion of granular resource sources within the ISR. ILA used this model to record all depletion information from permits issued during the period of 1985 to 1994. This provided historical usage information that was compared to forecasted demand. Actual volume of granular material used over the 10 year period was 480,000 m^3, although this does not capture any depletion of granular sources not under ILA jurisdiction. This was considerably lower than both of the previous demand forecasts had anticipated would be required. The discrepancy is due to the demand for speculative projects, such as the Tuktoyaktuk highway and Oil and Gas development that did not come to fruition. The demand for these speculative projects also included the related expectation of an increase in community growth and infrastructure. Therefore, demand at the community level was also forecast to be substantially higher than the actual usage.

The comparisons of the previous forecasts determined that the majority of demand is in the communities of Inuvik and Tuktoyuktuk comprising 96 -98% of the demands forecast in 1987 and 1991. Historically usage clearly demonstrates a significant decline coinciding with the reduction in oil and gas exploration activity in the region. The data shows a clear link between the exploration and development activity and the demand for granular material.

The demand information from previous forecasts was reviewed as a starting point for this report then compared to the historical usage data to determine the accuracy of the previous forecasts. Updated information was sourced from the Hamlets, the GNWT 1995/96 Capital Plan, ILA, DIAND, GNWT and other concurrent studies. Finally, the historical data, the previous forecast data and new information gathered was used to develop the new short and long term forecasts. The five year periods used in previous forecasts were averaged to provide data for each year for comparison purposes.

The previous forecast categories and classifications were used to develop new short term demands. Public demand was based primarily on the GNWT capital plan with capital expenditures being converted into equivalent granular requirements. Private demand was based on long term oil and gas exploration and development.

Various oil and gas development scenarios were presented along with associated volumes and classes of required material. The total demand forecast for the 20 year period of 1995 to 2015 was approximately 4,000,000 m^3 for all the communities. This projection was dependant for the most part on the level and timing of activity in the Oil and Gas exploration sector in the region. This forecast did not attempt to match demand with supply availability.

4.4 2001 Forecast

The most recent demand forecast was completed in 2001 by North of 60 Engineering Ltd. covering the period of 2000 to 2020.

The scope of this forecast was to:

- collect, review and consolidate information from previous forecasts and incorporate recent information not included in the existing model
- modify and update the “Granular Resource Demand Forecast Model” to improve performance, flexibility and compatibility with current DIAND systems, and
- to review historical usage and develop both short term (5 year) and long term (20 year) granular demand forecasts for the Inuvialuit Settlement Region.

The “Granular Resources Demand Forecast Model” was updated and migrated from Microsoft Excel to Microsoft Access to make it more user friendly. The previous five year granular usage data was captured and entered into the database. Comparisons of actual usage were made with the previous forecasts to provide a foundation for the new forecast.

This forecast continued the use of the same categories and classifications as in all previous forecasts. The data was presented on a yearly basis. The short term demand

was determined with the use of the GNWT 1999 Capital Plan, community input, GNWT, DND and Federal Government departments. The gas exploration sector provided information for the short and long term demands. The long term demand focused on gas exploration and development and provided various in depth granular demands based on a number of scenarios including the proposed gas pipeline and an oil pipeline.

Actual granular resource usage since the last forecast five years earlier was determined to have been 274,174 m^3, with approximately 15% consumed by the Inuvik Gas Project. This was considerably higher than projected for this period. The total 20 year demand forecast in this report was for 5,372,000 m^3, an increase of 30% due to the resurgence in gas exploration in the region.

The continuation of gas exploration, development and associated activities was predicted to consume 4,600,000 m^3 of granular material over the 20 year forecast period. Of this 66% was allocated towards onshore gas development. As in the previous forecast there was no attempt made to allocate or reserve any particular granular borrows as sources for supply. Historical usage information was obtained only from ILA and for granular material coming from Inuvialuit lands only.

5 METHODOLOGY FOR NEW DEMAND FORECAST

The IFA stipulates that regular periodic granular demand forecasting be performed and that granular resources be reserved based on the forecasted demands. There is also a necessity to prioritize different areas, as not all gravel reserves will be equally cost effective to use.

It should be noted that, in order to be effective, any granular resource demand forecast for the ISR must consider all potential demands on both public (Crown) and private (Inuvialuit-owned) lands. If this exercise was undertaken by either party, in isolation, there would be no way to consider the potential impact on the resources that might be supplied by other parties. Therefore, it is essential that the forecasting exercise be undertaken jointly by the ILA and DIAND.

5.1 Approach to Developing Forecasts

Demand forecasts for granular resources form the basis of any productive granular management process. The effectiveness of the planning process to ensure adequate supplies of material are available where and when required is determined to a large extent by the accuracy of these forecasts. Given the scarcity of the resource it is essential to attempt to match appropriate grades and qualities of granular material with types and categories of uses. Depletion records on historical granular use patterns on Inuvialuit lands is important as an excellent indicator of future community granular demand. Industrial development demand is generally project specific and therefore much more volatile and difficult to forecast.

5.2 Demand Categories

Demand can be categorized as being for community infrastructure, government or industrial development, etc. Table 1 describes these categories in more detail.

Table 1. Demand Categories.

Community / Public
Generally ongoing community operations & maintenance requirements and small scale residential development.
Government
Infrastructure and capital projects funded by GNWT or Federal Government.
Private / Industry
Demands from private companies such as the Oil & Gas sector or local contractors.

For forecasting purposes projects identified as requiring granular materials can be divided into three types of uses: planned capital projects, speculative capital projects and operations and maintenance requirements. Table 2 describes these types.

Table 2. Granular resource types of uses.

Operational and maintenance requirements
Refers to ongoing requirements such as for routine roadway, landfill or airstrip repairs and minor upgrading.
Planned capital projects
Relatively short term (5 years) plans by communities or MACA, GNWT, DND and other Federal Government departments. Examples: Schools, water/sewage treatment, hospital, new airstrip, erosion control, land development, housing.
Speculative capital projects
Specifically refers to larger projects that may or may not occur in the next 20 years. These projects usually require a significant funding commitment. Examples: new airstrips, lengthy highways (Inuvik/Tuk), construction of Oil & Gas infrastructure.

5.3 Classes of Granular Material

Higher grades of granular material are in very limited supply in the ISR and must be optimized for appropriate usage. The end use purpose of the material must be completely understood to facilitate the matching of demand with a supply of appropriate grades of material. Therefore, not only the volume of demand, but also the grade requirement is crucial to producing a reliable forecast. The ultimate goal of proper management of the resource depends on utilization of the most suitable material for the end use. The DIAND accepted system of classification is presented in Table 3.

Table 3. DIAND granular resource classification.

CLASS 1	Excellent Quality Material	Excellent quality material consisting of clean, well graded, structurally-sound sands and gravels suitable for use as high quality surfacing materials, or as high quality asphalt or concrete aggregate, with a minimum of processing.
CLASS 2	Good Quality Material	Good quality material generally consisting of well-graded sands and gravels with limited quantities of silt. This material will provide good quality base and surface course aggregates or structure-supporting fill. Production of concrete aggregate may be possible with extensive processing, except where deleterious materials are present.
CLASS 3	Fair Quality Material	Fair quality material consisting generally of poorly-graded sands and gravels with or without substantial silt content. This material will provide fair quality general fill for roads, foundation pads or lay-down yards.
CLASS 4	Poor Quality Material	Poor quality material generally consisting of silty, poorly-graded, fine-grained sand with minor gravel. These deposits may also contain weak particles and deleterious materials. These materials are considered suitable for marginal general (non-structural) fill.
CLASS 5	Bedrock, Felsenmeer and Talus	Bedrock of fair to good quality, felsenmeer or talus. Potentially excellent sources of construction material, ranging from general fill to concrete aggregate or building stone if quarried and processed. Also includes erosion control materials such as rip-rap or armour stone.

The GNWT uses a slightly different variation of the DIAND classification system, based on the anticipated usage of the material. An equivalency table with DIAND classification is presented in Table 4.

Table 4. GNWT granular material groups.

GNWT GROUPS	DIAND CLASSIFICATION
Concrete Aggregate (CA) Surfacing Material (SM)	CLASS 1
Concrete Aggregate (CA) Surfacing Material (SM)	CLASS 2
Base (B) Subbase (SB) Embankment (E)	CLASS 3
Subbase (SB) Embankment (E)	CLASS 4
Rip Rap, or if processed properly, equivalent to Class 1 or any other class of material	CLASS 5

5.4 Priorities

In addition to the above form of categorizing demand the IFA has stipulated priorities of access to granular resources with the ISR. First priority is given to Inuvialuit, second priority for private and corporate needs and third priority for any project approved by an appropriate government agency. To clarify, "any project approved" would include privately (non-Inuvialuit) owned and funded projects as long as approved by "appropriate governmental agency". Table 4 details these priorities with exerts from the IFA.

Table 5. IFA priorities of access.

Section 7.(27) First Priority
With respect to sand and gravel on Inuvialuit lands, as a first priority the Inuvialuit shall reserve supplies of sand and gravel of appropriate quality and within reasonable transport distances on Inuvialuit lands in order to meet public community needs in the Western Arctic Region and in Inuvik, based on reasonable twenty (20) year forecasts of the volumes required from Inuvialuit lands. The forecasts shall be prepared jointly by the Inuvialuit and the appropriate levels of government on the basis of community estimates of requirements, and shall be revised from time to time as required but, in any event, not less frequently than once every five (5) years.
Section 7.(28) Second Priority
As a second priority, the Inuvialuit shall reserve adequate supplies of sand and gravel of appropriate quality on Inuvialuit lands for the direct private and corporate needs of the Inuvialuit and not for sale, based on reasonable twenty (20) year forecasts of required volumes prepared by the Inuvialuit Land Administration.
Section 7.(29) Third Priority
As a third priority, the Inuvialuit shall make available sand and gravel for any project approved by an appropriate governmental agency.

5.5 Demand Survey

In order to generate a forecast a current granular resource demand survey must be made of all potential users of granular material during the forecast period. The survey should incorporate the same standards of categories and types of usage as previously used and outline above. A sample of a demand survey template is attached in Appendix B. The list of suggested contacts for granular resource demand and/or depletion information is attached in Appendix C.

If volumes and classes of material are not known by the surveyed organization an adequate project description can be converted using established models such as the GNWT example attached in Appendix D.

5.6 Depletion Records

The compilation of depletion records to determine volumes, classes used and the locations from which the material has been removed can be used for comparison purposes to incorporate into future forecasts. The depletion data can be requested at the same time as the demand survey information and be derived from all possible sources, irregardless of land ownership. Depletion information that is compiled should also be incorporated into the granular material supply database to update reserves.

6 CONCLUSIONS / RECOMMENDATIONS

It is quite evident that granular material has been utilized from sources that were not permitted by ILA, therefore the historical usage information used for previous comparisons was not inclusive of all sources of supply. This would explain the lower usage volumes as compared to specific projected demands. In order to allow for the continued correlation of previous demand forecasts to actual usage an attempt should be made to capture all depletion records, not only from ILA lands, but also from municipal and Crown lands within the ISR.

The extreme variations between all the previous demand forecasts have been determined to be due to the timing of large speculative projects, such as the Tuktoyaktuk to Inuvik road, or the gas pipeline. These projects account for the majority of demand, but only if they in fact occur is there a usage of granular material. The planning process required to actually develop these large projects includes a comprehensive screening and approval process that would include careful consideration of the supply of the granular material requirements and the impacts on the communities and their future needs. Therefore, it might be beneficial to provide demand forecasts separately for those speculative projects that have a generally fixed demand, but no real timeline. Community forecasts excluding these speculative projects would be more accurate and provide for more effective resource management planning to meet those needs that have a higher probability of completion. By forecasting community demands with more accuracy the goals of the IFA to reserve sufficient quantities of granular material for each

community's 20 year forecasted needs can be implemented. Given that communities generally have first priority over private demands this approach would ensure reserves are in place. If and when speculative projects are actually built the risk of competing for the same granular supplies is minimized.

The GNWT has recently started replacing the capital planning and budgeting process with block funding for capital projects directly to the Hamlets. In terms of demand forecasting the information that was available from one source – the GNWT Capital Plan – will now have to be obtained from each Hamlet directly. It is anticipated that this will affect the Hamlets' ability to project demands until they are certain of their funding. Only operational and maintenance requirements are guaranteed.

APPENDIX A:
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Granular Demand Survey Template

DATE	**INUVIALUIT?** Y ☐ N ☐
NAME OF ORGANIZATION	
ADDRESS	
CONTACT	
PHONE	**FAX**
EMAIL	

CATEGORY OF USE				
Community / Public	Generally ongoing community operations & maintenance requirements and small scale residential development.	CLASS 1	Excellent Quality Material	Excellent quality material consisting of clean, well graded, structurally-sound sands and gravels suitable for use as high quality surfacing materials, or as high quality asphalt or concrete aggregate, with a minimum of processing
Government	Infrastructure and capital projects funded by GNWT or Federal Government.	CLASS 2	Good Quality Material	Good quality material generally consisting of well-graded sands and gravels with limited quantities of silt. This material will provide good quality base and surface course aggregates or structure-supporting fill. Production of concrete aggregate may be possible with extensive processing, except where deleterious materials are present.
Private / Industry	Demands from private companies such as the Oil & Gas sector or local contractors.			
TYPE OF USE				
Operational & Maintenance	Refers to ongoing requirements such as for routine roadway, landfill or airstrip repairs and minor upgrading.	CLASS 3	Fair Quality Material	Fair quality material consisting generally of poorly-graded sands and gravels with or without substantial silt content. This material will provide fair quality general fill for roads, foundation pads or lay-down yards.
Planned Capital	Relatively short term (5 years) plans by communities or MACA, GNWT, DND and other Federal Government departments. Examples: Schools, water/sewage treatment, hospital, new airstrip, erosion control, land development, housing.	CLASS 4	Poor Quality Material	Poor quality material generally consisting of silty, poorly-graded, fine-grained sand with minor gravel. These deposits may also contain weak particles and deleterious materials. These materials are considered suitable for marginal general (non-structural) fill.
Speculative Capital	Specifically refers to larger projects that may or may not occur in the next 20 years. These projects usually require a significant funding commitment. Examples: new airstrips, lengthy highways (Inuvik/Tuk), construction of Oil & Gas infrastructure.	CLASS 5	Bedrock, Felsenmeer and Talus	Bedrock of fair to good quality, felsenmeer or talus. Potentially excellent sources of construction material, ranging from general fill to concrete aggregate or building stone if quarried and processed. Also includes erosion control materials such as rip-rap or armour stone.

PROJECT NAME or TITLE:

CATEGORY OF USE		TYPE OF USE		PROJECT SPAN (YEARS)		PROJECT DESCRIPTION	VOLUME OF GRANULAR MATERIAL REQUIRED (M^3)		PROBABLE SOURCE OF MATERIAL
COMMUNITY / PUBLIC		OPERATIONAL & MAINTENANCE		START	FINISH		CLASS 1		
							CLASS 2		
GOVERNMENT		PLANNED CAPITAL					CLASS 3		
							CLASS 4		
PRIVATE / INDUSTRY		SPECULATIVE CAPITAL					CLASS 5		
							Total	-	

APPENDIX C:

Granular Demand Source Information Contacts

Inuvialuit Land Administration
PO Box 290
Tuktoyaktuk, NT XOE 1C0
Website: www.inuvialuitland.com

Todd Romaine, Chief Land Administrator
Tel: (867) 977-7100
Fax: (867) 977-7101
Email: tromaine@irc.inuvialuit.com

Mike Harlow, Land Use Policy Coordinator
Tel: (867) 977-7111
Email: mharlow@irc.inuvialuit.com

Hamlet of Aklavik
Box 88
Aklavik NT X0E 0A0
Mayor Knute Hansen
Term Ends: 02 Jan 2010

Evelyn Storr, Senior Administrative Officer
Tel: (867) 978-2351
Fax: (867) 978-2434
Email: saoaklavik@permafrost.com

Hamlet of Paulatuk
Box 98
Paulatuk, NT X0E 1N0
Mayor Ray Ruben Sr.
Term Ends: 06 Jan 2009

Debbie Gordon-Ruben, Senior Administrative Officer
Tel: (867) 580-3531
Fax: (867) 580-3703
Email: hopaulatuk@hotmail.com

Hamlet of Sachs Harbour
General Delivery
Sachs Harbour, NT X0E 0Z0
Mayor Robert Eldridge
Term Ends: 06 Jan 2009

Raymond Kaslak, Senior Administrative Officer
Tel: (867) 690-4351
Fax: (867) 690-4802
Email: rkaslak@gmail.com

Hamlet of Tuktoyaktuk
Box 120
Tuktoyaktuk NT X0E 1C0
Mayor Mervin Gruben
Term Ends: 04 Jan 2010

Debbie Raddi, Senior Administrative Officer
Tel: (867) 977-2286
Fax: (867) 977-2110
Email: mailto: debbieraddi@airware.ca

Hamlet of Ulukhaktok
(formerly Holman)
Box 157
Ulukhaktok, NT X0E 0S0
Mayor Peter Malgokak
Term Ends: 01 Jan 2009

Lena Egotak, Senior Administrative Officer
Tel: (867) 396-8000
Fax: (867) 396-8001
Email: ulukhaktok_sao@airware.ca

Town of Inuvik
Box 1160, #2 Firth Street
Inuvik NT X0E 0T0
Mayor Derek Lindsay
Term Ends: 06 Nov 2009
Website:www.inuvik.ca

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APPENDIX D:
Granular Material Requirements by Asset (GNWT)

Project	Common	Select	Conc Agg.	Rip-Rap	Project	Common	Select	Conc Agg.	Rip-Rap
Above Ground Pool	500	375	0	0	Museum (sm)	200	150	50	0
Airport Lighting Rehab	0	100	0	0	Office (l)	675	425	0	0
Airport Maintenance Stockpile	0	5,000	0	0	Office (m)	500	500	0	0
Airstrip (new 900x60)	81,000	21,600	0	0	Office (hamlet)	500	375	0	0
Airstrip Resurface	0	5,400	0	0	Park Development (l)	4,900	2,500	0	100
Airstrip Maintenance	0	1,700	0	0	Park Development (sm)	600	1,400	0	50
Air Terminal	675	425	0	0	Rink (outdoor)	500	375	0	0
Apron Expansion	2,500	1,000	0	0	R/S/L-lot development	180	180	0	0
Arena (large)	850	475	0	0	Road(25m) & 1 Lot	300	200	0	0
Arena (medium)	675	425	0	0	Road Construction (1km.)	4,900	1,000	0	0
Arena (small)	500	375	0	0	Road Resurfacing (1km.)	600	1,400	0	0
ATB Expansion	250	100	0	0	Road Upgrade (1km.)	0	1,000	0	0
Breakwater	0	0	0	7,500	Satellite Base	300	300	250	0
Community Hall (l-440sq.m.)	675	425	0	0	School (new)	400	300	200	0
Community Hall (m-390sq.m.)	500	375	0	0	School (addition)	200	150	100	0
Community Hall (sm -250sq.m.)	300	300	0	0	Sewerage Lagoon	10,000	0	0	0
Curling Rink (1-4 sheets)	350	250	0	0	Shoreline Protection	0	600	0	4,000
Fire hall	350	300	50	0	Solid Waste Site	9,000	6,000	0	0
Garage (1-3 bays)	600	400	50	0	Solid Waste Improvements	6,000	4,000	0	0
Gas Station (in town)	600	400	50	0	Tankfarm	3,000	5,000	0	0
Group Home	500	475	0	0	Tankfarm (upgrade)	600	300	0	0
Gymnasium (l-440sq.m.)	675	425	0	0	Tankfarm (increase capacity)	3,000	5,000	0	0
Gymnasium (m-390sq.m.)	500	375	0	0	Trade Shop	300	300	0	0
Gymnasium (sm-250sq.m.)	300	300	0	0	Visitor Center	500	375	0	0
Health Center	675	425	0	0	Warehouse	900	750	0	0
Housing (single)	300	300	0	0	Water Supply (reservoir)	40,000	10,000	0	0
Housing (duplex)	500	375	0	0	Water Supply (improve.)	6,000	4,000	0	0
Housing (fourplex)	675	425	0	0	Water Treatment Plant	675	425	0	0
Lagoon Upgrade	5,000	0	0	0	Wharf	0	0	0	650
Museum (l)	350	225	100	0					

Source: Government of the Northwest Territories Page 11 of 13 GNWT Presentation to the Joint Review Panel on the Mackenzie Gas Project Sustainable NWT Granular Supply: Cumulative Effects of Mackenzie Gas Project's Granular Requirements