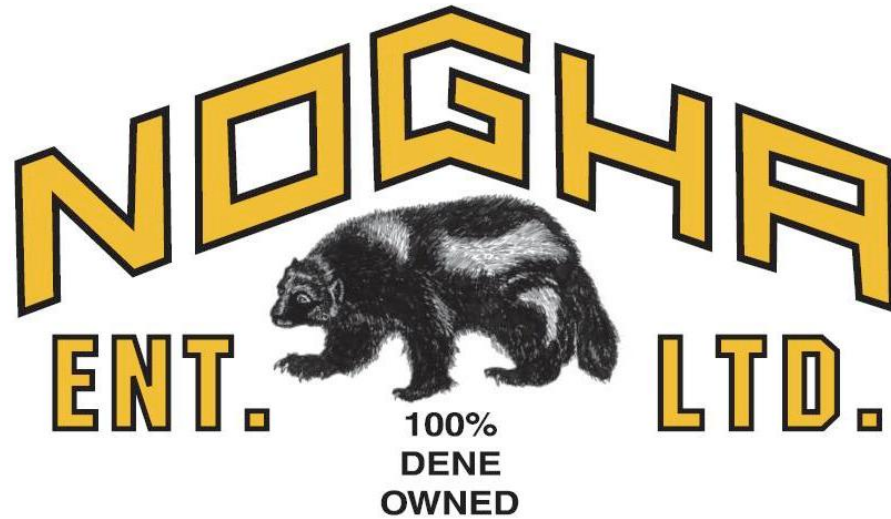


Gravel Quarry Development Plans



Gravel Quarry KM 518, Highway 1

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Section 1: Introduction:

1.1 Purpose

Nogha Enterprises Limited is a General Contracting company based out of Fort Simpson. Nogha has been working in the north for many decades.

The KM 518, Highway #1 site is an existing gravel quarry development and sets out a goal to supply quarry materials for the demands of industry, government or others who may need this product. The existing sand quarry is located approximately 50 kilometers north/west of the community of Fort Simpson. It is classified as a multi user pit.

The following Quarry Resource Development Plan will commit to the best management practices of the quarry resource development at the Km 518, Hwy #1 source. Nogha will work in tandem with the GNWT Lands Division, their regulatory Land Resources Officer to ensure these objectives are met during the initial start-up of the quarry operation through to the completion of the project. The plan is complementary to the terms and conditions contained in the authorizations. (licenses and permits).

Section 2: Description of the Deposit

2.1 Topographic Maps

Maps are available to depict the location of the gravel quarry site, access road route, quarry development dimensions, etc. Corresponding GPS data points are positioned to determine the alignment, distances to and from access points, the Department of Transportation highway easement, etc. It is not a requirement to apply for a Highway easement access permit as the access to the site is existing therefore no new development will take place.

Test Hole Location and Description

The test results from previous operations, show an abundance of fine gravel deposits throughout the defined quarry areas.

Summary Site Investigation and Test Hole (hand) Results

A site investigation and the results shown by previous users of the quarry show that the materials are comprised of a sandy material with little or no organics on the top layer of the original ground layer. Vegetation is comprised of small Jack Pine, < than 150mm in diameter, some willow growth, etc. 100 % of the area to be utilized has already been cleared from previous operations with an existing/current quarrying permit.

Section 3 Site Preparation

3.1 Access

The access route enters the Department of Transportation's easement at highway kilometer mark Km 518 of Hwy #1. A Hwy Access permit from the Department of Transportation is not required as there is an existing approved access. The only requirements are to follow the guidelines of this access road are safety and signage which Nogha will follow accordingly.

3.2 Timber/clearing

Clearing and grubbing has been completed previously.

3.3 Vegetation Retention

Construction activities will commence on the approval of the LUP permit and Quarry permit applications. Great care will be taken to clearing the site within the guidelines as set with best practices under GNWT's booklet for quarry development.

3.4 Clearing and Grubbing

Clearing and grubbing has been completed previously. Grubbing materials, although sparse at best, will be windrowed to the perimeters of the quarry for future pit restoration.

3.5 Salvage and Storage of Topsoil or Disposal of Overburden

The quarry site has a dimension of L-100 meters x W-40 meters; see diagram 1.1 The stripping depth from geo technical gathered shows an average depth of 100 to 200 mm. The borders of the staging area will remain treed, with a 5.0-meter buffer positioned around the stripping piles. Environmental 'best practices' are well suited with this concept and will be used throughout the quarry development.

- **Brush Disposal**

Any remaining brush and debris will be used on the pit restoration once the quarrying operation is complete.

- **Scales, buildings or Other Facilities**

Nogha will not require a weigh scale for this site.

- **Topographic Survey for Future Volume Checks**

A private legal surveying company such as EBA Consultants, Sub Arctic Surveys, etc. will be contracted to perform all the survey requirements for the quarry site

development. They will use the most up to date technology of satellite surveying/imagery, Auto Cad and end area method for calculations of the survey volumes. Once the quarry development is set into place to accommodate the original cross-sectional values of the pit, the surveying team will be brought in to set up the control sections, bench marks, base lines, the pit development for the benching with widths and depths of drill holes, etc. On completion of the quarry permit, a legal 'final' survey measurement of the materials excavated and hauled from the quarry source. The final quantities used/excavated will be submitted to the GNWT Lands Division, Lands Resource Officer on the required Monthly reporting form.

Section 4: Pit Operation

4.1 Sequence of Development, Extraction and Reclamation

The quarry site development will consist of clearing and grubbing of the site. The sand materials will be excavated and stockpiled using a crawler Cat or an excavator. Extraction will be consistent with the excavation maintaining 2:1 slopes around the perimeter of the excavation taking place. The proposed quarry development will be a multi-year development with applications proceeding for the yearly amounts required and GNWT's quarrying protocols.

Reclamation procedures/methods will be in place to ensure cleanup, trimming and tidiness' of the quarry pit are kept consistent and don't fall behind.

4.2 Limits on the Type of Equipment

The types of equipment for the development of the quarry site follow suit to the Land Use Permit submission. There are as follows:

Equipment List:

QUARRY EQUIPMENT LIST - Nogha Enterprises	SIZE/WEIGHT
HAUL TRUCKS	
Tandem Gravel Trucks (7.5 M3) Belly Dumps (14 M3)	21 to 45,000 kg
EXCAVATORS	
Excavator - 320 to 330 DL size	32 to 50 000 kg
LOADERS	
Loader- 930 to 9888	18 to 50 000 kg's
DOZERS	
Dozer D6R	21 tons
Dozer-DBR	52 tons
GRADERS	
Grader - 140M to160H w/ Riccer and Wino	20 to 25 tonne
CREW TRUCKS	
Crew Truck F-150	45 Kgs.

4.3 Grades of the Pit Floor

The grades of the pit floor will be consistent to diagram 1.3 in the appendix of this report. Once the pit is developed to the stage where the engineering survey team is brought on stream, base lines and survey elevations will be set into place to ensure proper drainage for design applications. This will remain consistent through the quarry development and especially when the quarry is complete for the season.

4.4 Prevention

The quarry development consists of a sandy material with design back slopes of 2:1 or greater. With this type of sloping/development the back slopes will represent no foreseeable long-term erosion problems. Summer inspections with the Land Resources Officer will highlight these conditions and remedial action will be in place to capture these events. The program would entail using on site gradations of appropriate quarried materials to stabilize and enhance erosion concerns.

4.5 Permafrost Degradation

The quarry site is located on a high ridge with moderate tree growth consisting mostly of Jack Pine. The ridge consists of a sandy based material and is not consistent to discontinuous permafrost conditions. In the unlikely event, should permafrost be detected, plans will be set in place to deal with this occurrence.

4.6 Local Water Management

The existing quarry site is located on a ridge with a natural sloping terrain from the bottom of the ridge to the crown of the ridge. A natural buffer zone will be left to approximately one hundred meters from the top of the ridge. Positive drainage will be a natural progression in the quarry design and benching approach. Since these activities will be surveyed by grade calculations, slope values and positive drainage will be maintained. The pit floor will also have a positive grade applied for drainage to flow and will not create a 'ponding effect'. As were grades will not exceed 4 % in value to create adverse flow and adverse erosion problems. The drainage will exist the pit floor to natural ground grade elevations at/near the entrance of the haul road.

4.7 Grades of the Side Slopes/benches

The quarry development will be engineered to standard grades.

4.8 Storage Area for Course or Fine Rejects

- applicable to the quarrying operation

4.9 Storage Area for Finished Products (ie stockpile, and permits required)

- applicable to the quarrying operation

Section 5 - Processing

5.1 Processing Limits

-- applicable to the quarrying operation

5.2 Screening Size Limits combined with, 5.3 Crushing Size Limits

- applicable to the quarrying operation

Section 6 - Reclamation

6.1 Desired Future Condition of the Site &

6.2 Environmental Protection

Nogha will have an on-going clean-up plan in place to 'keep up' with the required progression of the work entailed as not to fall behind. In conjunction with the RMO Land Resources Officer and site inspections, work will be identified and programmed on an on-going basis. The quarry site will be kept level and tidy; on completion of the quarry activities, future restoration of the pit will be refined placing stock piled reclamation materials such as over burden, debris piles/organics which will be spread uniformly over the depleted portions of the quarry.

6.3 Aesthetics

The quarry site at completion of the life of the development will follow suit to reclamation plans as previously described. Plans will be in place to utilize the appropriate equipment such as smaller Crawler Cats to trim, level and place reclamation materials aesthetically correct over the required areas of the pit floor, side slopes, etc. Finishing HEO heavy equipment operators employed by Nogha will be used to complete this task.

6.4 Wildlife Habitat Enhancement

Working in conjunction with the RMO Land Resources inspector, the Wild Life Enhancement part of the final restoration plan will be developed and implemented. Plans would include specifics related to enhancement of the re-vegetation using locally stored materials and if required, reseeding & fertilization using the appropriate (approved) mixtures.

6.5 Water Diversion or Protection

As described previously, the quarry development will maintain a positive drainage management plan for the pit floor and excavated/extraction areas. On completion of the operations and final clean-up of the quarry, positive drainage course will be improved to enhance drainage requirements. Based on the initial site development plans of the quarry, no disruption to drainage courses will be encountered. No 'man made materials'

will be placed i.e. culverts, drainage structures, etc. into the pit development. All work is based on winter construction practices during frozen conditions.

6.6 Sloping/benching

Nogha will maintain a progressive maintenance program ensuring that the quarry development is kept sloped and contoured throughout the seasonal operations. Crawler Cats with experience finish operators will adhere to the Quarry Operating Guidelines book. On completion or life of the quarry, for restoration purposes, all stripping piles and organic sources stockpiled in the pit staging area will be spread at even intervals on the pit floor and the surrounding quarry perimeters. Reclamation of the quarry site will be easily achieved and will be aesthetically complete/pleasing.

6.7 Perma-frost Stabilization

During the geo technical investigation, no permafrost was evident. At the completion of the quarry site, the general appearance of the quarry will be composed of exposed sandy materials and limited to minor mitigation/movement or erosion factors. Given these factors and the natural ground outside the perimeters of the quarry being undisturbed, the permafrost layer/factor is not a relevant factor in this case.

6.8 Vegetation

At completion and final cleanup, landscaping, restoration of the quarry site, plans will be set into place to look at the various options required to promote re-vegetation of the required areas at the quarry site. This may include an approved seed mixture and fertilizer to enhance/promote the re-vegetation process. The Guidelines for Reclamation/re-vegetation in the NWT will be followed.