



## **QUARRY DEVELOPMENT PLAN DORRIS TO WINDY ROAD**

**August 29, 2008**

In addition to the Nuna Quarry Operations plan that was forwarded on an earlier Date.

### **1.0 Quarry Development**

Quarry A and Quarry D are being reviewed for development. There is a possibility that the development of Quarry B will be necessary if the amount of material mined from the quarries (A and D) is insufficient to complete all road work.

In this plan, no access roads are needed for Quarry A and Quarry D as the projected road alignment to Windy passes thru the two Quarries. If Quarry B is required to be developed, an access road will be built to the quarry in the NW corner (see illustration).

The access road (if needed) into Quarry B will be at a minimum 1m in depth and 6m wide.

### **2.0 Blasting Methods**

The Quarry sites that have been deemed suitable for use providing that the archeological site buffer zone is kept in tact, therefore due care will be taken in order to maintain the integrity of these sites. The blasts will be designed to shoot away from the archaeological sites. Prior to any blast, the rock face will be cleaned to minimize the potential of fly rock.

The following blasting method will be applied.

- Powder factor                      1.0
- Stemming                            1.5m (with 3/8" crushed rock)
- Pattern                                2.1m x 2.1m
- Delays                                Single hole delay with offset timing will be used in order to limit the blasting to one hole at a time which will reduce the vibration to a minimum.

Single hole delay's will be used for maximum shot placement away from the archaeological site and row timing will be increased to prevent back break to insure all rock is moving in a forward motion away from the archeological sites.

For extra precaution, the blast limits will be set 60 m from the recommended 30m buffers zones located in the quarries. This extra buffer will offer further protection from any possible disturbance to the archaeological sites.



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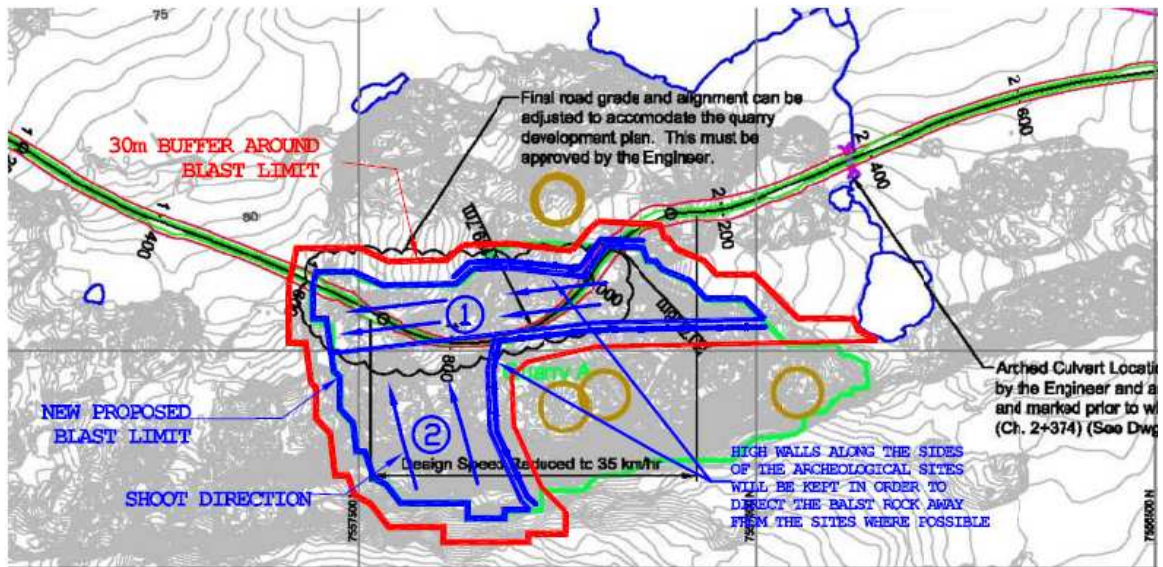
### **3.0 Crushing Operation**

To reduce the haul distances for crushed rock, the Crusher will eventually be relocated within Quarry D limits from its current location at Quarry #2. A 100m x 100m crusher pad will be built within the quarry limits to accommodate the crushing operation and to stockpile material (run of mine and crushed material).

### **4.0 Till**

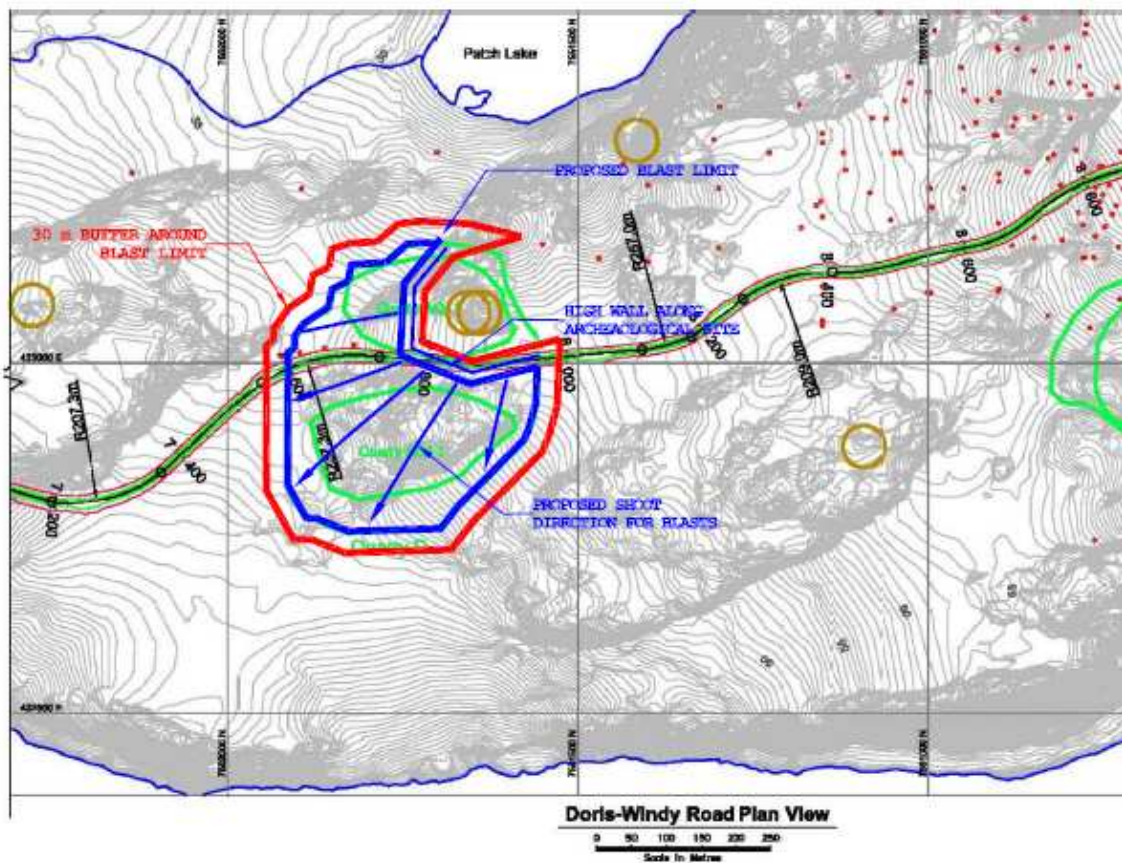
A nominal amount of till was noticed during an aerial inspection of quarries. If till has to be removed from the pattern, it will be back hauled to the existing till dumps in Roberts Bay.

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### Doris-Windy Road Plan View

## QUARRY A



## QUARRY D



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