

Waste dump #1 will store primarily waste rock. The construction of the waste dump will start at contour elevations that allow any runoff to flow to the open pit and be handled by pit sumps. In the event that seepage water quality is low and quantity from waste dump site 1 is high enough, Pond A will be constructed.

Waste dump #2 will store overburden and waste rock. Any drainage from the waste dump site 2 will initially flow to a sump in the open pit and subsequently to Pond B if significant quantities are encountered.

Since the initial waste rock production will be needed for project development, access and overburden containment, waste rock disposal at waste dump #1 is scheduled to occur after overburden deposition at waste dump #2 commences. There is flexibility to increase the height and/or merge the dumps to provide additional capacity should mine plans be altered during the first year of operation.

2.1.2 Foundation Conditions

2.1.2.1 Waste Dump Site 1

The drilling results and the surficial geological mapping indicate that the foundation conditions at waste dump site 1 consist of bedrock with isolated soil deposits. The soil deposits typically range in thickness from 0 to 3.2m and consist of granular colluvial soils or till with, in some locations, a thin veneer of organic soil. The site is underlain by permafrost. A series of ephemeral streams flow across the dump site to Carat Lake. In general, these occupy broad zones over which the water flows very slowly in the spring and early summer. Grassy vegetation is commonly associated with these streams.

2.1.2.2 Waste Dump Site 2

Based on site reconnaissance and surficial geological mapping, the foundation conditions at waste dump site 2 consist primarily of bedrock, with some till in the south edge of the site. This site is also underlain by permafrost.

2.1.3 Dump Designs

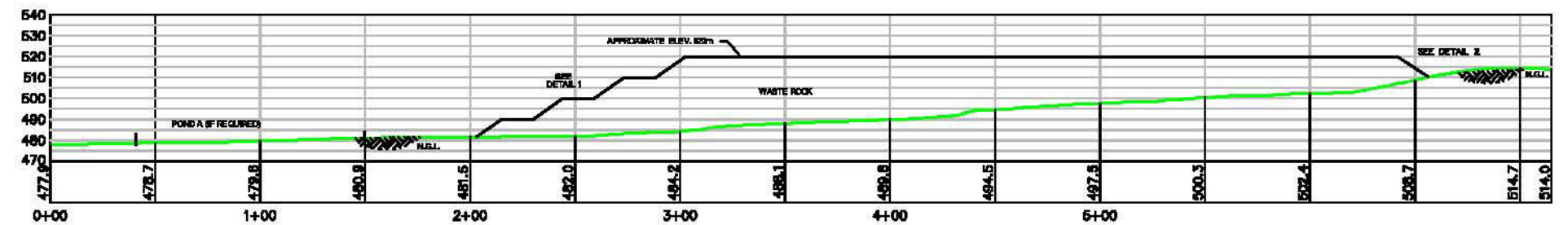
2.1.3.1 General

Dump designs have been developed on the basis of the properties of dump materials, the foundations conditions at the dump sites and the approximate volume of mine waste that will be produced as a result of the current mine plan. The details of these designs are provided below. Typical sections through the two waste dumps are provided in [Figure 2-2] Drawing WRMP-P1-3. The corresponding dimensions and storage capacities of the proposed waste dumps based on the planned OP/UG quantities are provided in Table 2-2 [SRK Table 4.1]. The dump capacity can be increased through design modifications if required.

Table 2-2: General Dimensions and Storage Capacities of the Waste Rock Dumps

Site	Area (ha)	Approx. Crest Elev. (m)	Height (m)	Capacity (Mt)	Capacity (Mcm)
Waste Dump Site 1	37.7	520	44	13,930	7.739
Waste Dump Site 2	12.5	520	21	2,382	1.377

Notes: 1. The storage capacities quoted in Table 4.1 are based on the current dump layouts.
2. Depending on the findings from the first year of mining, the mine plan may change.
3. In the event that a change in the mine plan leads to an increased waste rock storage requirement, the storage capacity of these dumps can be increased significantly by measures such as raising the dumps and/or increasing their footprint areas in a way that preserves the objectives outlined in Section 4.1.



Profile view of the proposed road. The horizontal axis represents stationing from 0+00 to 3+00. The vertical axis represents elevation in feet, ranging from 489.5 to 520. The road profile is shown as a black line, and the ground level is shown as a green line. Key features include 'OPEN PT' at station 0+00, 'DETAIL 1' at station 2+00, and 'WASTE ROCK' at station 3+00. A horizontal line at elevation 489.5 is labeled '489.5'.

Diagram illustrating the proposed road and drainage system. The road is shown with a 2% slope. The ditch is labeled "WASTE ROCK DITCH" and has a 2' (1 H:1 V) slope. The road is labeled "OVERBURDEN AND WASTE ROCK". The diagram also shows "WASTE ROCK" on both sides of the road. The vertical axis shows elevations from 497.0 to 540. The horizontal axis shows stationing from 0+50 to 4+00.

Diagram illustrating a waste rock bench design. The bench is constructed with a $\approx 35^\circ$ bench angle for waste rock. The vertical height of the bench is $\approx 10\text{m}$, and the horizontal distance is $\approx 15\text{m}$. The final reclamation slope is uniformly graded, and the average slope is $\approx 21^\circ$ (2.8 H : 1 V). The ground level is marked as N.G.L. (Natural Ground Level).


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Figure 2-2
WASTE DUMPS 1 AND 2
SECTIONS AND DETAILS

DRAWING NUMBER	WRMP - P1 - 3
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REV.

DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	SHEET NO.	DATE	REV.	A FINAL DESIGN	ISSUE PURPOSE	DOC.	AUTH. BY	MAY 2006	DATE
REFERENCE DRAWINGS			REVISIONS			ISSUE AUTHORIZATION						

The thickness of each dump lift is expected to be approximately 10 m, but depending on the projected height of the structure and the number of benches, the lift thickness may be modified in order to develop relatively uniform bench heights. Overall slopes of between 2.6:1 to 1.4:1 depending on location and dump performance, as described below. During the LOM, the slopes between benches will correspond to the angle of repose of the dump material, which is expected to be about 1.4H:1V (35 degrees).

2.1.3.2 Waste Dump Site 1

The overall downstream slopes at this waste dump will be about 2.6H:1V (21 degrees), except for internal slopes during the course of dump development. Those slopes along the east side of the dump will be equal to the angle of repose or approximately 1.4H:1V (35 degrees). This variance is based on how the dumps will be constructed and the fact that the ground along the east side of the dump toe is rising, which is favourable to dump stability.

2.1.3.3 Waste Dump Site 2

Waste dump site 2 will be used primarily to store a mixture of overburden and waste rock, much of which will be frozen when it reports to the waste dump #2. Some portion of the overburden stockpile may thaw during the summer months and may require confinement at the dump perimeter. As a consequence, the design of the waste dump #2 includes a waste rock buttress for the downstream slope that will be used to provide confinement to the soils in the event they thaw and show a propensity to slump or “run.” The slopes at this waste dump will be about 2.6H:1V (21 degrees), except for internal slopes during the course of dump development. The performance of the overburden will be evaluated following the first summer of operations, and if conditions warrant, the slopes on the upstream side may be optimized.

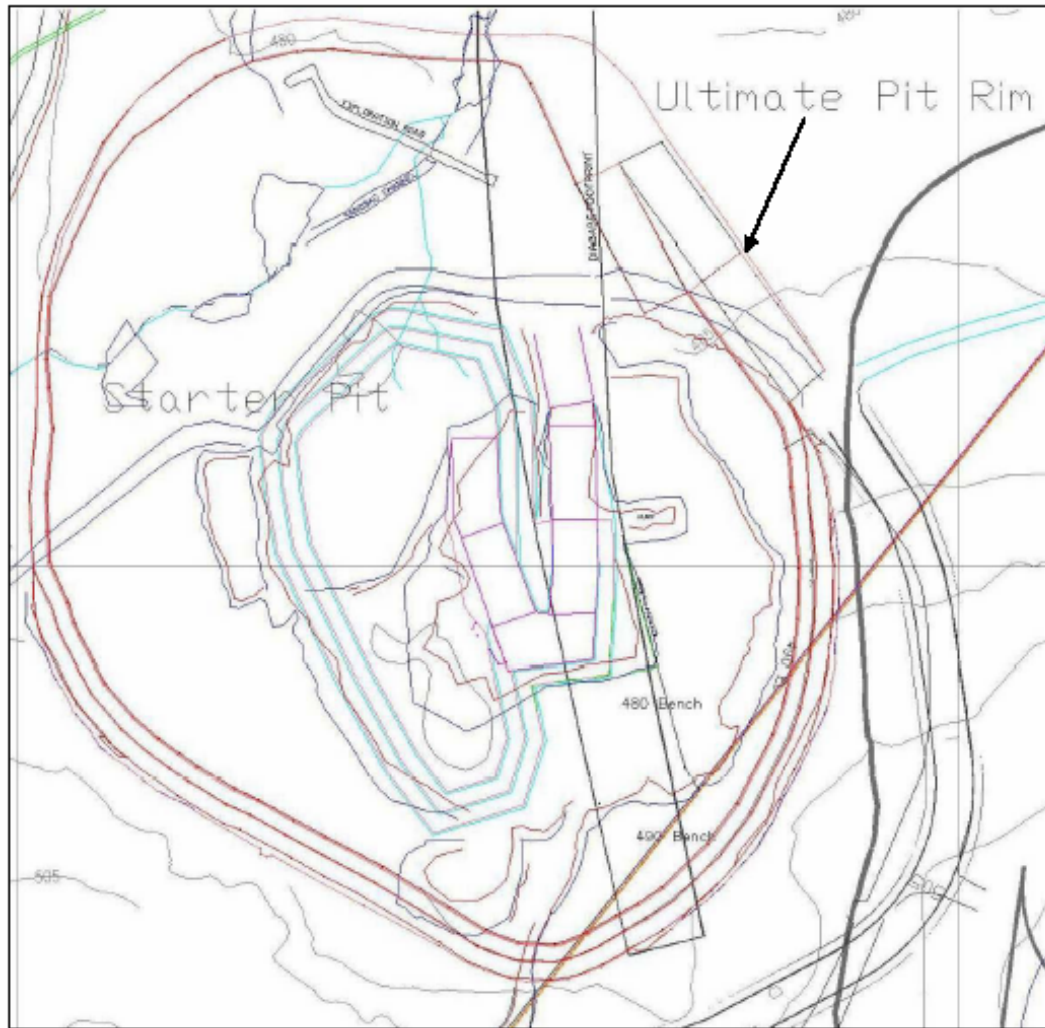
Some of the overburden at waste dump site 2 may be used in conjunction with the mine closure activities.

2.2 Open Pit

The ultimate pit planned is shown in Figure 2-1. The open pit was designed by SRK (Tahera 2003, FEIS, Section 5). The Mine Plan submitted for commencement of work (Tahera 2005a) discusses operation of the pit and some modifications from the SRK 2003 design recommended by Piteau Associates (2005). This section provides pit design.

The ultimate pit (Figure 2-3) will be approximately 350 m wide by 400 m long and will cover an area of approximately 10 hectares (the pit is roughly oval). Permafrost extends to a depth of approximately 540 m, thus it is assumed there will be essentially no groundwater seepage into the pit. The small stream crossing the northern pit area was diverted into Carat Lake via a surface diversion.

Figure 2-3: Ultimate Pit



2.2.1 Pit Slope Angles

Piteau revised the conceptual pit slope angles designed by SRK based on rock characteristics confirmed from starter pit development. Following a desktop review of SRK design information, Piteau conducted geotechnical field investigations to collect data from the starter pit benches to obtain information on rock mass competency and variability, and to assess geologic structural conditions and current bench performance.

Kinematic Analysis

At the Jericho Mine, the rocks are generally of sufficient intact strength and competency that bench and interramp stability will primarily be controlled by geologic structure rather than by the strength of the rock mass. Kinematic analyses were conducted to identify possible structurally controlled failure mechanisms that could occur on individual benches and interramp slopes.

Recommended Preliminary Interramp Slope Design

The basic parameters used to define the geometry of a benched slope are illustrated in [Figure 2-4], and recommended preliminary slope design criteria are summarized in Table 2-3 below. Applicable slope design criteria depend on the structural domain and slope dip direction.

For rockfall catchment protection, a minimum (effective) berm width of 9m after breakback, is recommended for the 22.5 m high triple benches. The berm widths reported in Table 2-3 include the 9 m effective width plus the expected breakback. Note that no additional berm width to account for potential crest breakback has been included in the calculation of berm width for design, as good bench crest performance was observed in the starter pit.

Where a pit wall transitions through two or more adjacent design sectors with different slope design criteria, blending of the designs will be required to establish a practical overall pit design. Transition zones should be located in the design sector with the steeper slope design to avoid oversteepening.

2.2.2 Pit Design

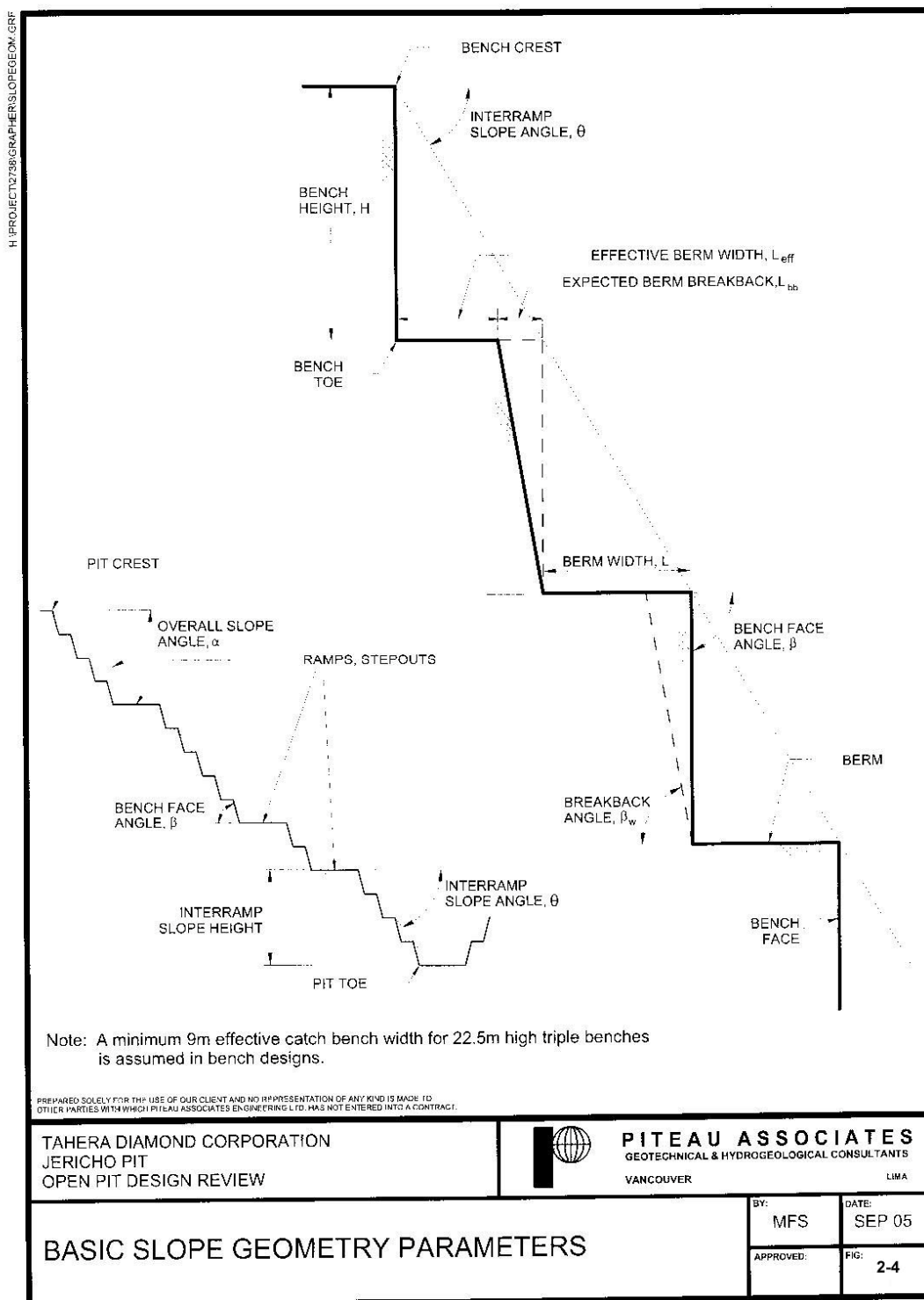
This section is taken from Tahera (2003) Project Description, Section 5.

While pit shells generated from optimization routines provide a relatively good preliminary indication of resources amenable to economic exploitation by open pit methods, a workable design is normally required before reliable material inventories can be produced. Equipment logistics, pit wall configurations, and access are a few of the considerations that impact on the overall design. The vertical pipe shape of the Jericho orebody and resulting deep conical shape of the optimized pit shell requires a spiral ramp access that can result in a significant discrepancy between the optimized pit reserves and the detailed pit design reserves. This is usually due to the difficulties with accessing the lower ore in the optimized pit shell and errors in estimating the overall angle during the optimization. It must be stressed that pit shells generated by pit optimization routines often contain less waste and are marginally deeper than workable designs. Therefore the detailed (workable) pit design is primarily for the purpose of improving the accuracy of the ore reserve and the waste volume.

Table 2-3: Pit Slope Angles

	Kimberlite	Granodiorite	Overburden
Slopes			
Inter-ramp < 100m (degree)	41-70	65-70	26.5 (2:1)
Inter-ramp > 100m (degree)	41	60	-
Bench Configuration			
Bench height (m)	10	10	10
Bench face angle (degree)	70	85	-
Bench width (m)	8	8	-
Berm Interval (m)		30 (triple bench)	
Ramp Configuration			
Gradient (%)	10	10	10
Width (m)	22	22	22
Operating Limits			
Minimum mining width -pushback	40	40	40
Pit Bottom	50	50	50

Figure 2-4: Pit Slope Angles



To 31 December 2006, 568,500 tonnes of kimberlite and 3,132,400 tonnes of waste had been mined from the Jericho open pit.

2.3 Processed Kimberlite Containment Area

The processed kimberlite containment area (PKCA) was designed by SRK and was described in the Jericho Final EIS, Appendix A (Tahera 2003). SRK dam design was updated by EBA Engineering in a number of design and operation reports submitted to NWB in 2005 and 2006 for the West, East and Southeast dams and the Divider Dyke. Appendix A (this report), Drawing 1 shows the layout of the PKCA.

2.3.1 PKCA Impoundment

The PKCA impoundment was constructed in a small lake basin by means of damming low areas. The lake was dewatered in late 2005 to provide storage capacity. The West and East dams were constructed in the winter of 2005/2006; the Southeast Dam was constructed in the winter of 2006/2007.

2.3.2 West Dam

This section was taken from EBA Jericho West Dam Design Report. (2005a).

2.3.2.1 Design Cross-Sections

The planned layouts and typical cross-section of the West Dam are presented in Figures 2-5 and 2-6 [EBA Drawings WD-3 and WD-4].

The nature of the foundation soils is such that it is desirable to maintain them in a frozen condition rather than necessitating a massive excavation below the embankment. Consequently, a frozen core earth dam on a permafrost foundation will be utilized. An effective frozen core dam requires that the central core and foundation remain frozen year around to act as an impervious barrier against seepage. The core and foundation must be nearly saturated with ice to produce a well-bonded and impermeable mass, and the permafrost must be sustained. A secondary seepage barrier is provided by a geosynthetic liner on the upstream face of the frozen core. Similar designs have been developed by EBA for the EKATI Diamond Mine.

The upstream shell primarily consists of rockfill. A small till zone has been placed at lower elevations to reduce convective water movement through the open graded rockfill. The downstream shell of the dam will be constructed of rockfill. This will provide a strong material and will have minimal settlement. The rockfill shells are designed to be constructed with 3.0H:1V outside slopes.