

CONDITIONS OF MINING LICENCE 32-2388 (incorporating Favona, Trio Variations – and 2017 Variation)

This Mining Licence was originally issued in 1987 for the Martha Project. Subsequent variations to the Mining Licence have been issued to provide for the following:

- The Extended Project (1999);
- Processing of material from the Favona underground mine (2003), inter alia;
- Processing of material from the Waihi Epithermal District, including the Trio underground mine; and raising the height of the tailings dam TSF1A (2011), inter alia;
- Development and trial stoping for the Martha Exploration Project (2012), inter alia; and;
- A delay in completing rehabilitation of the Storage 1A embankment to RL166m (May 2014).

In 2017, variations were made to:

- Delete reference to the development and trial stoping for the Martha Exploration Project on the basis that the project did not proceed,
- Make administrative changes to correct minor errors, update wording, remove construction related conditions that had served their purpose and provide clarity.

All activities authorised by this licence shall be undertaken in accordance with the varied conditions of Mining Licence 32-2388 as set out in full hereunder.

First Stage

The licensed project shall be undertaken in accordance with the conditions of mining licence 32-2388 as set out at 16 July 1987.

Second Stage

The Extended Project shall be undertaken generally in accordance with the information contained in the Assessment of Environmental Effects - Text and Figures (July 1997) and supporting technical documents submitted by Waihi Gold Company to the Minister in support of its application for the variation of licence required for the extended project and as subsequently confirmed or modified in further information supplied to the Minister in response to Section 92 Resource Management Act 1991 requests and evidence called by the licensee at the hearing held in Waihi between 20 November 1997 and 17 February 1998, and as amended by the variation of conditions of licence.

Third Stage

Any amendments to the pit design to ensure that the pit walls are left in a stable and safe state in preparation for closure shall be undertaken in accordance with the conditions of this Licence. Such amendments shall be considered by the peer reviewers, as required by condition 7A prior to being undertaken.

Similarly, amendments within the waste disposal area to accommodate changes to waste rock and ore quantities arising from an amended pit design shall be undertaken in accordance with the conditions of this licence and considered by the relevant peer reviewer(s) as required by condition 7A prior to being undertaken.

General and particular work programmes

1. The work to be undertaken pursuant to this licence shall be limited to the following:

- (a) Construction

Construction of mine surface facilities, the ore-waste conveyor, the conveyor tunnel, the process plant, wastewater treatment plant and the tailings and waste rock disposal area, including removal and burning of vegetation and waste timber, stripping and stockpiling of top soil and the stripping of overburden and waste, the construction and destruction of noise barriers and all associated civil works and facilities.

- (b) Mining

Open pit and minor underground mining, access and exploratory work, using explosives and mechanical excavating, truck handling of material within the pit area and that portion of the rest of the licence area that lies to the west of Junction Road, conveyor belt handling to a chemical processing plant, beneficiation and ore treatment including waste and tailings disposal within the licence area.

- (c) Rehabilitation

The licensee shall progressively implement Part A of the approved Rehabilitation and Closure Plan and shall implement Part B of the approved Rehabilitation and Closure Plan in the event of closure occurring. The approved Rehabilitation and Closure Plan is the plan approved pursuant to the conditions of the resource consents granted by the Waikato Regional Council and the Hauraki District Council.

(d) Monitoring

The regular monitoring of pit slopes, tailings retaining structures, ground movement, noise, blasting, vibration, air quality and rehabilitation programmes together with the necessary rectification work as required.

Except as provided for elsewhere in these conditions, or as required or authorised by or pursuant to any governing legislation, the licensee, in carrying out the foregoing work shall do so generally in accordance with the methods of mining and programme of work appended hereto as "Annex A".

2. In order to assist the Inspector of Mines to determine that the proposed operations are in conformity with the general work programme and the conditions of the licence, the licensee shall before starting work and at intervals not exceeding twelve (12) months thereafter, or where any significant change is to be effected, submit in triplicate a detailed work programme of operations proposed for the subsequent twelve (12) months to the Inspector of Mines. Except for the purposes of restoring the land surface and preventing damage to the environment, no work other than that specified in the detailed work programme or provided for elsewhere in these conditions or by legislation shall be carried out pursuant to the licence. Each such work programme submitted shall give details of the area to be mined, equipment to be used, provisions for access, power and water supply, stockpiling of soil, subsoil, overburden and tailings, settling ponds, area to be restored and methods of restoration, and any other significant matters.

Construction operations

3. In respect of the extended project, construction conditions shall apply to the following activities:

Initial Construction Activities

- Removal of vegetation from around the extended pit, removal of topsoil, the initial cut-back, batter and first bench at any point around the pit;
- Demolition and relocation of pit surface facilities from inside the Mining Licence;
- Creation of noise bunds at Grey Street and to the west of the extended pit;
- Upgrade of conveyor system;
- Site clearance and topsoil stockpiling;
- Upgrade of pipeline from pit to Water Treatment Plant;
- Upgrade of Process Plant;

- Construction of pipeline from the Water Treatment Plant to the Ohinemuri River;
- Construction of the foundations of Storage 1 A

Other Construction Activities

- Reworking of noise bunds at Grey Street and to the west of the pit at the end of their life;
- Removal of all plant and equipment during the closure/rehabilitation phase and recontouring of the land;
- Construction of lake outlet tunnel, enclosed structure and open channel

4. Prior to commencement of construction at the mine site, conveyor corridor, plant site, or waste disposal area the licensee shall provide the territorial authority with a copy of the construction programme indicating the proposed sequence of operations and their timing. During the construction period this copy is to be updated at regular three (3) monthly intervals.

5. deleted

6. deleted

7. deleted

7A Pit

(a) The licensee shall engage, at its own cost, a Peer Review Panel ("the Panel"). The members of this Panel shall be fully independent of the planning, design, and construction of the open pit at the Martha Mine, and all associated facilities.

(b) The primary function of the Panel is to ensure that the conditions relating to design, construction, operation, and rehabilitation associated with the key components of the open pit mining, and all associated development works (with particular focus on pit slope stability issues) are met, that the open pit is stable and that such work is undertaken by appropriately qualified personnel in accordance with best practice.

(c) The Panel shall comprise technical specialist(s) who between them have demonstrated expertise in the following fields:

- Geotechnical, with recognised experience in open pit construction and rock mechanics experience;
- Hydrogeology, with recognised open pit mining experience;
- Rehabilitation, with experience in open pit revegetation, rehabilitation and closure

(Note: There may be any number of individuals on the Panel, so long as the necessary areas of expertise are covered)

- (d) The members of the Panel and their defined field(s) of expertise, shall be approved by the Minister prior to the appointment of the Panel.
- (e) Each member of the Panel may act as Peer Reviewer only in their area of expertise, but the full Panel shall review all plans relating to the open pit construction.
- (f) The Panel may co-opt other specialist members to assist in any of its functions for specified periods subject to the approval of the Minister.
- (g) The licensee shall provide the Panel with all records, plans, designs etc that the Panel requests, and shall afford the Panel full access to the site at all reasonable times.
- (h) The Panel or individual members of the Panel may be the same panel as that which undertakes peer review as required by any other consent (including authorisations issued prior to the Resource Management Act 1991) relating to the mining licence area.
- (i) To carry out its primary function, the Panel shall report in writing to the Minister on all matters which are submitted to it for review, other than draft proposals submitted to it by the licensee and which are superseded, and at least at the following times:
 - Prior to commencing the extension related mining activities associated with the open pit;
 - At all critical stages during the development of the open pit (eg slope formation near the Cornish Pumphouse, major remedial works - eg coal seam at 1800 east, initial work on forming the pit perimeter);
 - On completion of open pit mining;

- On completion of lake filling;
- On rehabilitation of Area A

on at least the following matters:

- The Pit Slope Management Manual and any subsequent updates as are appropriate;
- Progress against the Annual Work Programme;
- Pit development including hydrogeological issues and geotechnical issues;
- Performance against the requirements of the Pit Slope Management Manual;
- Pit slope stability monitoring; and
- Rehabilitation and closure plans.

(j) The licensee shall develop a Pit Slope Management Manual. This manual shall be peer reviewed by the Panel and submitted to the Minister for approval prior to exercise of this consent. The Pit Slope Management Manual shall address at least the following issues:

- Procedures for the investigation, monitoring, excavation and backfilling of old mine stopes where required;
- Specifications for the construction and placement of stope pillars where required;
- Backfilling of the trial stopes;
- Development of a monitoring regime focused on monitoring groundwater and pit slope behaviour;
- Procedures for the investigation and remedial measures of old coal seams, and monitoring of the same;
- Location and installation of horizontal drains for the purposes of addressing groundwater and surface water effects;
- Monitoring of Pumphouse stability;
- Instability contingency response.

(k) By 1 December 2017 the licensee shall prepare a plan of the buffer zone associated with the open pit addressing the bullet points below and to the satisfaction of the territorial authority.

This plan may be updated at any time including where requested by the territorial authority and is to be approved in writing by the territorial authority.

The licensee shall consult with land owners and/or occupiers within the buffer zone associated with the extended open pit. In each case the licensee shall:

- Identify the facilities potentially at risk;
- Develop a contingency response appropriate to these facilities in the event of instability;
- At its own cost, in the event that these facilities are adversely affected as a result of pit mining operations, restore those facilities to their former condition and provide for interim provision of an equivalent facility until such time as this is achieved or provide alternative equivalent facilities. These arrangements shall be to the satisfaction of the Minister.

7B Company Liaison Officer

- (a) The licensee shall appoint a person ("the Company Liaison Officer"), subject to the approval of the Minister to liaise between the licensee, the community, and the Minister as set below. The Company Liaison Officer shall have sufficient delegated power to be able to deal immediately with complaints received and shall be required to investigate those complaints as soon as possible after receipt.
- (b) The name of the Company Liaison Officer together with the contact phone numbers for that person shall be publicly notified in local newspapers by the licensee prior to the commencement of the extended project (at least one month prior, but not more than two months prior to the commencement of construction activities) and at least once a year thereafter.
- (c) The Company Liaison Officer shall be appointed prior to the commencement of the extended project and this position shall be filled at all times during the construction activities as defined in Condition 3.

Council Liaison Officer

- (d) The licensee shall provide all the reasonable costs associated with the appointment and support of a Council Liaison Officer, to be employed by and be responsible to the Minister during the construction activities as defined in Condition 3.

(Note: The following is for information purposes only and does not form part of the condition.

The Council Liaison Officer may either be a new appointment or may be an existing employee.

Whether or not the appointee is an existing employee, the Council Liaison Officer's role shall be independent and objective and designed to promote effective gathering of information of effects upon the community from the mining activity; and, in the light of such information, to promote effective liaison with the Company Liaison Officer so that the effects identified may be remedied or mitigated.)

The functions and responsibilities of the Council Liaison Officer shall be as follows:

- (i) Liaise between the Company Liaison Officer, members of the community, the Waihi Liaison Forum (or its equivalent), and the Minister;
 - (ii) Report to the Minister on an "as events happen" basis, and weekly on complaints received, actions undertaken by the licensee and the complainant in respect to complaints, and on any other relevant actions and activities occurring during the week;
 - (iii) Ensure that the Company Liaison Officer is providing information to residents in the area around the mine and tailings facilities of the activities that are programmed to be undertaken in the coming week (especially land clearance, construction and blasting), activities that were carried out in the previous week and any other material that will inform the residents of what is programmed to happen in the coming weeks;
 - (iv) Facilitate the appointment of a mediator, venue, time etc agreeable to both parties, to undertake the mediation of disputes or concerns between the licensee and members of the community. Except in those situations where both parties are in agreement, the Council Liaison Officer's function is not to act as a mediator. The role of mediation is a specialist one that needs to be undertaken by persons experienced and trained in this area.
- (e) The Company Liaison Officer shall, during construction activities, report weekly to the Council Liaison Officer on all complaints received in the prior week and the action taken to investigate those complaints. In addition, the Company Liaison Officer shall investigate and report on any other matters as directed by the Council Liaison Officer

concerning or arising out of construction activities. (See periods of construction activities as defined in condition 3.)

- (f) The Company Liaison Officer shall give residents who are likely to be affected and the Council Liaison Officer reasonable (minimum one week's) prior notice of construction activities, indicating likely timing and duration.
- (g) Following completion of initial construction activities, and prior to the commencement of other construction activities (ie during operations stage), the Company Liaison Officer shall report six monthly to the Minister on the following:
 - (i) All complaints received during the previous six month period, action taken by the licensee and the resolutions, if any;
 - (ii) Other matters of concern raised by the community;
 - (iii) Any mediation entered into by the licensee and others with respect to operational matters and the outcome (unless the parties have agreed to keep such confidential).

7C Complaints procedure and mediation

Note: the following is for information purposes only and does not form part of the condition.

- Complainants will be expected to contact the Company Liaison Officer in the first instance (refer condition 7B(a)).
- During construction activities, if a complainant is dissatisfied with the response by the Company Liaison Officer, they shall contact the Council Liaison Officer with the details of the complaint and the Company Liaison Officer's response. Outside the construction activities, complainants shall contact any officer of the Minister.

The licensee shall comply with the following complaints procedure and mediation process:

- (a) The Company Liaison Officer shall meet with the complainant and the Council Liaison Officer to discuss the complaint and ways in which the issue can be resolved.
- (b) If the parties cannot agree on a resolution, the matter shall be put to mediation.

(Note: The following is for information purposes only and does not form part of the condition:

- (i) Refer condition 7B(d)(iv) above.
- (ii) Unless the parties agree the outcome of mediation shall not be binding.)

7D Noise Bunds

- (a) The licensee shall, prior to commencing construction and reworking activities associated with the noise bunds associated with the extended project prepare and submit detailed proposals to the Minister.
- (b) Proposals shall indicate:
 - Activities to be carried out, including their sequence and duration. A discussion on construction and removal methods considered shall be provided.
 - Plant and equipment proposed to be used.
 - Any activities likely to be undertaken on land beyond the ownership or control of the licensee, the duration of such activities, and proposed measures to mitigate adverse effects that might be experienced by the general public and/or adjacent residents as a consequence of these activities.
 - Proposals with respect to the removal or demolition of existing houses lying within or adjacent to the proposed noise bund (construction proposals only).
 - Proposed measures to mitigate potential adverse effects (in particular noise, dust, traffic generation and visual impact) occurring as a consequence of construction and removal activities, in particular measures aimed at safeguarding adjacent residential amenity.
- (c) This condition shall be read in conjunction with Condition 25, including the proposals under this condition to incorporate the screen planting provisions.
- (d) The Company Liaison Officer shall also ensure that the programme of construction and reworking the noise bunds is provided to all residents in the immediate area surrounding the bund who in his/her opinion are likely to experience the effects of these activities and to the Council Liaison Officer. This programme shall be provided at least 5 days in advance of the work being undertaken.
- (e) The construction of part of the noise bund over Junction Road cannot be undertaken until such time as the stopping of Junction Road has been completed.

- (f) A 2 metre high close boarded wooden fence shall be constructed along the Grey Street frontage to visually screen the site and to provide noise attenuation, prior to any clearance of vegetation or other activities associated with the extended project are undertaken. Once the noise bund is completed, the 2 metre high closed boarded wooden fence can be removed to be used on the top of the noise bund.
- (g) Non acid forming material shall be used in the construction of the noise bund to ensure that no leaching occurs during or after construction of the noise bund.

7E deleted

7F Lake Outlet Tunnel Construction

- (a) The licensee shall, prior to commencing construction of the lake outlet tunnel, the enclosed structure and channel to the Mangatoetoe Stream prepare a detailed construction and design report, such report to be submitted to the Minister for approval prior to implementation.
- (b) The construction and design report shall indicate the main construction activities to be undertaken, materials to be delivered to the construction area, materials to be removed from the construction area, duration and timing of the tunnel, enclosed structure and open channel construction, and proposals concerning the rehabilitation of areas disturbed during construction.
- (c) Following the Minister's approval of the construction and design report this information shall be passed to adjoining residents and the Council Liaison Officer by the Company Liaison Officer.
- (d) Vibration levels resulting from the construction of the tunnel measured in the ground closest to any affected residence excluding those properties owned by the licence holder or related Company or subject to an agreement with the licence holder or related Company shall not exceed the vibration levels specified in condition 20(d).

In the event that a property is sold and ceases to be subject to an agreement between the licence holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the licence holder (or related Company) and the landowner, the location for the measurement of vibration shall revert to being in the ground closest to the affected residence.

- (e) The construction of the tunnel and the enclosed structure shall be carried out and completed to the satisfaction of the Minister.

7G Archaeological, Historical or Cultural Discoveries

Should any features of archaeological, historical, or cultural significance be discovered during the construction phase or the operational phase, work in the relevant area will be discontinued and the Hauraki District Council, Heritage New Zealand Pouhere Taonga, and Ngati Tamatera, as appropriate, are to be notified by the licensee within 24 hours.

With respect to archaeological discoveries, work in the direct area will not recommence until consent is obtained from Heritage New Zealand Pouhere Taonga and/or the Hauraki District Council, if such consent is required.

With respect to discoveries of cultural significance to Ngati Tamatera, if practicable and after consultation with Ngati Tamatera, the discovery shall be left in situ and all reasonable efforts will be taken by the licensee to protect that discovery. If it is not practicable to leave the discovery in situ, then Ngati Tamatera shall be given a reasonable opportunity to arrange for the removal of the discovery, and the licensee shall provide reasonable assistance to Ngati Tamatera to do so, if so requested by Ngati Tamatera.

Hours of work

8. Construction work shall be limited to within the following hours:

Monday - Friday 0700-2000 daily

Saturdays 0730-1800

- (a) Provided that construction work hours at the process plant site shall be permitted outside of the above hours as long as the noise levels do not exceed those specified in Condition 9(a).
- (b) The above hours of work do not apply with respect to the use of water trucks for the purpose of controlling dust, so long as this activity complies with the noise level criteria of condition 9.

Construction noise during construction period

9. (a) With the exception of Waihi Central School where the construction noise limit shall be 55dB L_{Aeq} at any point within the boundary of the school, all construction activities

provided for by the Mining Licence taking place within the Mining Licence area shall not exceed the following limits:

Monday-Friday	Saturdays	L_{Aeq}	L_{AFmax}
0630-0730		60	70
0730-1800	0730-1800	75	90
1800-2000		70	85

At all other times, including Sundays and Public Holidays, the noise level shall not exceed 40 dB L_{Aeq}

All noise shall be measured within or close to the boundary of any residentially zoned site or the notional boundary of any occupied rural dwelling site not owned by the licence holder or related Company or not subject to an agreement with the licence holder or related Company.

In the event that a property is sold and ceases to be subject to an agreement between the licence holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the licence holder (or related Company) and the landowner, the location for the measurement of noise shall revert to being on or close to the boundary of that residentially zoned site or the notional boundary of the occupied rural site.

- (b) Construction noise shall be managed, measured and assessed in accordance with New Zealand Standard 6803:1999 Acoustics – Construction Noise.
- (c) Deleted.
- (d) Deleted
- (e) Tree-felling shall be conducted to minimise as far as practicable noise intrusion on all neighbouring properties.
- (f) Unwanted surface material at the mine site shall be used wherever practical when barriers are required close to the pit edge or near the rotary crusher to reduce noise.
- (g) Soil stored in the waste disposal area shall be used where practical when noise attenuation is required.

- (h) All equipment and machinery shall be regularly maintained to ensure noise levels as low as reasonably attainable.

Blasting and vibration

10. Deleted

Dewatering

11. (a) The licensee shall prepare a Dewatering and Settlement Monitoring Plan. The purpose of this Plan is to monitor and assess the effects of dewatering associated with the extended project on land settlement and the effects of the mining activities on the subsurface hydraulic regime. The Dewatering and Settlement Monitoring Plan shall address at least the following:

- (i) An overall description of the groundwater and settlement monitoring system and the measures to be adopted to meet the objectives of the groundwater and settlement monitoring system.
- (ii) Details of the piezometer network proposed to monitor the effects of pit dewatering on the aquifers under Waihi township.

Any monitoring bores additional to the existing piezometer network shall be installed and operational prior to the commencement of the extended project.

- (iii) Details of the settlement monitoring network proposed to monitor the extended zone which has been, or is likely to be, affected by settlement caused by mine dewatering.

Any settlement monitoring network locations additional to the existing monitoring locations shall be installed and operational prior to the commencement of the extended project.

- (iv) Details of the survey of facilities in the Waihi township considered by the licensee to be potentially "at risk" of damage from ground settlement caused by mine dewatering. The survey to be completed shall include collection of information about the facility's location, the nature of construction materials, the

nature of sensitive equipment that might be potentially "at risk", and the sensitivity of this equipment to ground settlement caused by mine dewatering and/or tilt.

This survey shall be completed prior to the commencement of the extended project.

- (v) A settlement contingency plan to include mitigation measures to be implemented in the event that ground settlement caused by mine dewatering induces a tilt that exceeds 1 in 1000 between any two network monitoring locations spaced no less than 25 metres apart. The settlement contingency plan shall particularly address those facilities identified by the licensee as being potentially "at risk" of damage from ground settlement caused by mine dewatering.
- (vi) A dewatering contingency plan that describes the steps the licensee shall implement in the event that dewatering results in adverse impacts on affected aquifer systems and associated groundwater supplies used for domestic, stock or other purposes.

In detailing the monitoring programmes the licensee shall provide information on the monitoring methods proposed, the parameters to be monitored, and the calibration and maintenance of monitoring equipment.

In the event of any conflict or inconsistency between these conditions and the provisions of the Dewatering and Settlement Monitoring Plan, these conditions shall prevail.

- (b) The Dewatering and Settlement Monitoring Plan shall be submitted to the Minister for approval at least one month prior to the commencement of the extended project. The licensee shall review and update (as necessary) the Plan and shall provide promptly such updated Plan to the Minister for approval.
- (c) If in the opinion of the Minister the dewatering adversely affects land or facilities, then the licensee shall at its own cost be responsible for reinstating the facilities to an equivalent standard to the reasonable satisfaction of the Minister.
- (d) The licensee shall measure and record the daily volume of water abstracted.

- (e) The licensee shall undertake water level monitoring of the piezometer network in accordance with the Dewatering and Settlement Monitoring Plan.
- (f) The licensee shall monitor ground settlement at a minimum of six monthly intervals in accordance with the Dewatering and Settlement Monitoring Plan.
- (g) In the event that a tilt greater than 1 in 1000 occurs between any two network monitoring locations spaced no less than 25 metres apart, and such tilt is caused by mine dewatering, or there is a significant variance from the predicted settlement rates described in the approved Dewatering and Settlement Plan the licensee shall notify the Minister, in writing, within 20 working days of receiving the results of the monitoring. The licensee shall then:
- Explain the cause of the non-conformance;
 - Agree with the Minister on the appropriate settlement contingency measures to be implemented as described;
 - Implement settlement contingency measures as appropriate;
 - Advise the Minister on the steps the licensee proposes to take in order to prevent any further occurrence of the situation.
- (h) The licensee shall provide to the Minister an annual dewatering and settlement monitoring report. The report shall include at least the following information:
- The data from monitoring undertaken during the previous year including ground water contour plans (derived from the data) in respect of the piezometer network;
 - Identification of any environmentally important trends in settlement and dewatering behaviour;
 - Interpretation and analysis of any change in groundwater profile over the previous year, any contingency actions that may have been taken during the year, predictions of future impacts on other bore users that may arise as a result of any trends that have been identified, and what contingency actions, if any, the licensee proposes to take in response to those predictions
 - A comparison of the settlement survey data with that predicted in the approved Dewatering and Settlement Plan;
 - Comment on compliance with this condition;
 - A summary and analysis of complaints relevant to this condition;
 - Any reasons for non-compliance or difficulties in achieving conformance with this condition;

- Any works that have been undertaken to improve environmental performance or that are proposed to be undertaken in the forthcoming year to improve environmental performance in relation to activities permitted by this condition;
- The report shall be forwarded in a format acceptable to the Minister.

Ore, waste rock and overburden removal

12. (a) Any ore, waste rock or overburden removed from the pit area during the construction period shall be moved off the site by way of the conveyor.
- (b) The licensee may remove up to a maximum of 6 truck loads (12 truck movements) on any one day of tramp material from the extended pit to the existing Baxter Road recycling depot, for either recycling or controlled burning or other authorised disposal.
- (c) Where necessary, due to weather conditions or otherwise, all vehicles carrying tramp material from the mine shall pass through a wheel wash at the mine before entering onto a public road.
- (d) The licensee shall retain a record of each truck load of tramp material carried and these records are to be made available for inspection by the Minister upon request.

13. Deleted

Air quality

14. Deleted

Production operations

15. (a) Any ore, waste rock or overburden removed from the open pit during the operations period shall be moved off the site by way of the conveyor.
- (b) The licensee may remove up to a maximum of 6 truck loads (12 truck movements) on any one day of tramp material from the extended pit to the existing Baxter Road recycling depot, for either recycling or controlled burning or other authorised disposal.

- (c) Where necessary, due to weather conditions or otherwise, all vehicles carrying tramp material from the mine shall pass through a wheel wash at the mine before entering onto a public road.
- (d) The licensee shall retain a record of each truck load of tramp material carried and these records are to be made available for inspection by the Minister upon request.

Underground workings

16. The licensee may undertake minor underground mining operations and associated activities within the licence area provided that:
- (a) The stability of overlying land, both during and after mining operations, is not likely to be endangered; and
 - (b) No mining operation shall extend beyond the surface pit perimeter.
 - (c) No mining operation shall be carried out at a depth greater than 140 metres below sea level. This shall not prohibit exploratory drilling below that depth.

Occupational health dust

17. Deleted

18. Deleted

Hours of work

19. (a) Open Pit Mining and Conveying (other than maintenance work).
Permissible operating hours within the open pit, adjacent service facilities and conveyor corridor shall be restricted to:
- | | |
|---------------|-----------|
| Monday-Friday | 0700-2100 |
| Saturday | 0700-1200 |
- (b) Operations within the process plant
The plant may operate twenty-four (24) hours per day, seven (7) days per week.

(c) Operations within the waste and tailings area (other than maintenance work)

Permissible operating hours within the waste and tailings area shall be restricted to:

(i) Waste disposal:

Monday-Friday 0700-2100

Saturday 0700-1200

(ii) Tailings disposal: Twenty-four (24) hours per day, seven (7) days per week.

(d) The above hours of work to apply provided that operations in (a) and (c)(i) above are only permitted between 1900 and 2100 hours Monday-Friday if the operations are of an urgent nature and necessary for the effective carrying out of mining operations and that they comply with the noise level criteria as specified in Condition 21(a).

(e) Details of all operations conducted under (d) above shall be entered into a record book kept for that purpose.

(f) The above hours of work in conditions (a) to (d) do not apply with respect to the use of water trucks for the purpose of controlling dust so long as the activity complies with the noise level criteria of condition 21.

Blasting and vibration

20. (a) All blasting procedures shall be carried out so as to ensure the safety of persons in the mine and/or in the immediate vicinity of the mine site. The licensee shall notify WorkSafe New Zealand of the blasting procedures to be employed and of any changes thereto and the blasting procedures shall be approved by WorkSafe New Zealand. The blasting procedures shall address the following specific items: regular blasting times, warning and all clear signals, control of fly rock, vibration and air blast monitoring and such other matters as WorkSafe New Zealand may direct.

(b) No blasting operations shall be carried out without the written approval of the Mine Manager, who shall first satisfy himself that the blasting operations will not cause either danger, damage or undue discomfort to any person or danger to property.

(c) A blasting programme shall be publicly notified in newspapers circulating in the area prior to any blasting taking place and at regular intervals not exceeding six (6) months thereafter. Changes to the blasting programme will be notified in newspapers circulating in the area at least three (3) days prior to implementation.

The Company Liaison Officer shall also ensure that the blasting programme and changes to the blasting programme are provided to all residents in the immediate area surrounding the mine who in the opinion of the Company Liaison Officer (after consultation with the Council Liaison Officer) are likely to experience the effects of blasting and vibration. The same respective notification time periods shall apply.

- (d) Vibration levels measured in the ground closest to any affected residence excluding those properties owned by the licence holder or related Company or subject to an agreement with the licence holder or related Company shall be 95% compliant with a maximum level for ground vibration of 5mm/s and shall not exceed a Vmax of 10mm/s (both expressed as vector sum of velocity components). The 95% compliance limit is defined as the level not to be exceeded for 95% of blasts over the preceding twelve month period. Blasting is permitted within the following hours:

Open Pit Operations

Monday-Friday	1000-1500
Saturday	1000-1200

In the event that a property is sold and ceases to be subject to an agreement between the licence holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the licence holder (or related Company) and the landowner, the location for the measurement of vibration shall revert to being in the ground closest to the affected residence.

In the Annual Work Programme required by condition 2 the licensee shall provide a list of properties owned by it or a related Company or which are subject to an agreement between it or a related Company, and the property owner regarding vibration and/or noise.

- (e) Details of all blasts shall be recorded as set out in condition 29.
- (f) The peak overall sound pressure level due to air blasts shall not exceed 128dB linear (unweighted), measured at any affected residence excluding those properties owned by the licence holder or related Company, or subject to an agreement with the licence holder or related Company.
- (g) Deleted

- (h) Except where specifically provided in condition 20(f) all blasting operations and measurements in relation to operations shall be carried out in accordance with AS2187.2:2006 The Use of Explosives.

(i) Vibration Management Plan

The licence holder shall prepare a Vibration Management Plan. The objective of this plan is to detail the methods to be used to comply with conditions 20 and 29.

Noise

21. (a) All activities provided for by the Mining Licence taking place on any site within the Mining Licence area shall not exceed the following limits when measured at or within the boundary of any residentially zoned site or the notional boundary of any occupied dwelling in the Rural Zone and measured over the periods specified below:

Monday-Friday	0700-2100	55 dB L _{Aeq}
Saturday	0700-1200	55 dB L _{Aeq}
All other times		40 dB L _{Aeq}
	2100-0700 (the following day)	70 dB L _{AFmax}

All noise shall be measured within or close to the boundary of any residentially zoned site or the notional boundary of any occupied rural dwelling site not owned by the licence holder or related Company or not subject to an agreement with the licence holder or related Company.

In the event that a property is sold and ceases to be subject to an agreement between the licence holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the licence holder (or related Company) and the landowner, the location for the measurement of noise shall revert to being on or close to the boundary of that residentially zoned site or the notional boundary of the occupied rural site.

- (b) Deleted

- (c) Deleted

- (d) Noise shall be measured in accordance with the provisions of New Zealand Standard NZS 6801:2008 Acoustics – Measurement of Environmental Sound and assessed in accordance with the provisions of NZS 6802:2008 Acoustics – Environmental Noise.

(e) Noise Management Plan

The licence holder shall prepare a Noise Management Plan. This Management Plan shall be submitted to and approved by Hauraki District Council. The objective of this plan is to detail the methods to be used to comply with conditions 21 and 30.

Fencing

22. (a) The licensee shall provide and maintain a secure fence around the Martha Hill mine site, along the conveyor route and at all other sites on which any operations, other than purely administrative, are carried out pursuant to or in connection with the licence, including any bridge crossings of the conveyor route.
- (b) Any other fencing as required by WorkSafe New Zealand shall be to a visual standard acceptable to the territorial authority.
- (c) On completion of mining operations any fences not required for safety purposes to be either removed or retained by mutual agreement between the territorial authority and the licensee.

Lighting

23. Any night lighting established shall be installed, designed, located and shaded in order that the level of lighting measured at the boundary of any site not owned by the licensee is no greater than 8.0 lux.

Water

24. The licensee shall ensure that all conditions relating to the grant of any water right or waterway approval associated with this licence are complied with without delay. Except in conformity with a water right or waterway approval the licensee shall not affect the quality or quantity of any natural water in any manner whatsoever.

Landscape plan

25. The licensee shall prepare and implement a maintenance programme for the removal of invasive exotic trees, plants and seedlings in areas surrounding the open pit. The maintenance programme shall be documented in the Rehabilitation and Closure Plan referred to in condition 1c.

The removal of screening vegetation surrounding the open pit shall be approved by the Minister prior to being undertaken.

Monitoring

26. The licensee shall carry out monitoring of those aspects of the construction and production operations, using the methods and at the frequency more particularly specified in Condition numbers 27 to 32 inclusive hereof. All measurements taken shall be entered into a record book, which shall be made available to any Inspector of Mines for inspection and copying at any reasonable time.

Ground movement

27. Deleted

Pit slope stability

28. Deleted

Blasting

29. (a) The licensee shall monitor every blast event in terms of blast location, charge weight per delay, number of holes, initiation timing and measured vibration. Where equipment malfunctions or is not available for recording (eg during maintenance), this shall be noted and included in the monitoring report presented to the Minister. Where blasting is to be undertaken in the vicinity of the overpressure sensor, the licensee shall also monitor the overpressure level. The location of the fixed vibration and overpressure sensors shall be undertaken in consultation with the Minister, and changes to the location of these sensors and monitor shall be agreed with the Minister prior to their relocation. The licensee shall deploy a roving monitor to record blast vibrations in the location where complaints regarding vibration have been made. The results of the monitoring shall be provided to the Minister.

- (b) The licensee shall, unless otherwise directed to do so by the Minister following consultation with the licensee, provide a quarterly summary report to the Minister on the blasting undertaken, and the vibration and overpressure levels recorded, as well as any complaints received.
- (c) Monitoring in the ground at the base of the Cornish Pumphouse shall be undertaken when blasting is carried out within a 250 metre radius of the structure. The peak component vibration levels shall not exceed 25mm/s at frequencies in the range 20 to 30 Hz within the 250 metre radius. A report addressing changes to the building's structural integrity (with particular emphasis on changes that are likely to be caused by blast-induced vibrations within 250 metres) shall be supplied to the Minister on the anniversary of the date of commencement of the extended project. The report shall be prepared by a registered engineer experienced in such work.

Noise

- 30. (a) The licensee shall at weekly intervals during construction activities (as defined in Condition 3) and at intervals not exceeding six (6) months during operational activities, assess and record representative noise levels generated by mining operations.
- (b) Representative noise levels during construction and operation activities shall be measured and assessed in accordance with the methods specified in Conditions 9 and 21.
- (c) The licensee shall, unless otherwise directed to do so by the Minister following consultation with the licensee, provide a quarterly summary report to the Minister on the representative noise levels.

Air quality

- 31. Deleted

Waste rock embankments and tailings ponds

- 32. Deleted

Rehabilitation

General

- 33.** The licensee shall rehabilitate the whole licence area in accordance with the approved Rehabilitation and Closure Plan referred to in condition 1c, and in accordance with the work programme specified in condition 2.
- 34.** The licensee shall progressively strip and stockpile, as far as practical, topsoil from all areas to be used for construction and waste disposal in the process plant and waste disposal area. This stockpiled topsoil or topsoil stripped during the course of operations shall be used to produce the maximum rehabilitation benefit.

Mine site

- 35.** At all times mining shall be carried out in a manner which will ensure that environmental disturbance is kept to a minimum. All necessary steps shall be taken by the licensee to prevent unnecessary destruction of or damage to vegetation or property and to ensure the safety of the public and livestock.
- 36.** Mining, processing and waste disposal operations shall be carried out in such a manner as to ensure that the surface of the land suffers as little permanent damage as possible. The licence area is to be left in a clean and tidy condition after mining operations have ceased including removing from public view any used derelict equipment and machinery and the pit faces are to be left in a stable and safe condition.
- 37.** The upper pit slopes shall be treated to ensure revegetation as soon as possible in the mining programme and in accordance with the current approved Rehabilitation and Closure Plan. Revegetation of the upper slopes will be carried out as far as practicable and may preserve some areas without vegetation to preserve and reflect the mining heritage of the town provided that the water quality of the Pit lake remains suitable for direct discharge to surface waters in accordance with resource consents held by the licensee from the Waikato Regional Council.
- 38.** Adequate drainage shall be provided on all access tracks and benches beyond the pit perimeter to prevent erosion of any adjacent land.

Conveyor route

39. Upon completion of the project the land along the conveyor route shall be restored to its former condition unless the territorial authority requires that it shall be left for use as a public walkway or other useful amenity provided that the cost of so doing does not exceed the cost of restoration to the former condition.

Process plant site

40. If, at or after the end of mining operations, the process plant or the wastewater treatment plant is dismantled, the area formerly occupied by and surrounding the dismantled plant shall be contoured, and as far as is reasonably practicable restored, and in a manner that will protect water quality and avoid soil erosion.

Tailings and waste disposal site

41. The licensee shall make good all final surfaces of the waste rock embankments, tailings storage areas, perimeter bund and any associated work in the waste and tailings disposal area at Baxter Road.
42. Rehabilitation of the final surface shall be progressive as areas of a practical working size become available and shall include the provision of a suitable rooting medium, contouring and drainage as required, to ensure the establishment and maintenance of a surface which will protect water quality and avoid soil erosion.
- 42A (a) Prior to each increase in embankments and crest height of Tailings Storage Facility 1A above RL 166, as part of the Third Stage – Continued Waihi Operations within Annex A, the licensee shall provide to the Hauraki District and Waikato Regional Councils for their approval, a report detailing the height of the crest rise, the sequence of works proposed, and an anticipated timeline in which the physical works and revegetation of the embankments and crest will occur. The approved report shall form part of the Rehabilitation and Closure Plan required by 1(c) of this licence and shall incorporate the revegetation programme in 42A(c) below.
- (b) The licensee shall have completed revegetation of the embankment slopes of Storage 1A to RL166 by 31st March 2015.
- (c) Unless otherwise agreed in writing by Hauraki District Council and Waikato Regional Council, the licensee shall undertake the revegetation planting of the embankment

slopes of Storage 1A such that after 31st March 2015, all revegetation planting shall be staged relative to the annual lifts of the embankment crest, i.e. the lift undertaken in the previous season is to be revegetated while the current season's lift is being undertaken. Stockpile areas are excluded from the requirements of 42A(b) & (c).

- (d) If the programme in 42A(c) above is not achieved, the licensee shall forthwith provide a review to Hauraki District and Waikato Regional Councils detailing the reasons why this has occurred and measures proposed to address programme timing.

Road

43. Should it become necessary to use Moore Street on a regular basis then the licensee shall be responsible for upgrading the street to the satisfaction of the relevant territorial authority. Otherwise Moore Street shall be used only in emergencies or for exceptional access to the process plant.

Buildings

44. All buildings shall be designed and completed in accordance with the New Zealand Building Code and shall be maintained to a standard acceptable to the territorial authority.

(Note: The following is for information purposes only and does not form part of this condition.

The tailings storage embankments require building consents which are issued by the Waikato Regional Council.)

Post-production

45. Deleted

General

46. The licensee shall take whatever precautions are necessary to protect the old Cornish Pumphouse.

Public liability insurance

47. The licensee shall effect and keep current public liability insurance.

The indemnity expressed in the insurance policy shall be sufficiently wide in its coverage so as to include claims arising from damage caused by or resulting from fire or explosion and all firefighting costs resulting from the licensee's operations in respect of the land.

The licensee shall, if so requested by the Minister, provide the Minister with a copy of the insurance policy and the receipt evidencing payment of the premium in respect of such policy.

ANNEX A

METHODS OF MINING AND WORK PROGRAMME

INTRODUCTION

First Stage: Licensed Project

The first stage of mining at Martha Hill commenced in 1987.

Mine surface facilities include crusher, repair shop, change room, warehouse, offices and a carpark

Waste rock and overburden together with ore are transported by an overland conveyor to the waste disposal area and process plant area

The process plant has a capacity of 930,000 tonnes per annum

Waste rock and tailings are disposed of in Storage 2 and 1 at the waste disposal area

Waste water is treated in the water treatment plant prior to discharge to the Ohinemuri River

The first stage of mining will when completed around the year 2000 comprise the following elements:

- Pit area - 30 hectares
- Pit depth - 205 metres
- Pit floor level - RL 960¹
- Pit length x breadth - 730 x 540 metres
- Total waste rock volume - approximately 13 million BCM
- Total ore processed - approximately 11 million tonnes
- Total tailings - approximately 10 million m³
- Two tailings storage facilities - Storage 2 and 1. Storage 2 will have a height at approximately RL 156 and cover an area of 130 hectares. Storage 1 will have a height at approximately RL 140 and cover an area of 60 hectares. On completion of mining Storage 2 and 1 are to be rehabilitated by returning the slopes of the embankments to grass and native vegetation. The tailings ponds will be partly capped and partly developed into wetlands.

¹ A RL of 0 (mine datum) is 1000m below sea level.

Second Stage: Extended Project

The second stage of development will continue mining until around the year 2007 and will enlarge the pit referred to above, both by widening it and deepening it. (This will enable more ore to be extracted from within the mining licence area.)

The extended pit is both within the mining licence area and partly outside that area. As no ore is to be extracted from that part of the pit that falls outside the mining licence area no further mining licence (or mining permit) is required. Rather for that part of the pit that falls outside the mining licence area, land use consents have been obtained from the Hauraki District Council.

Clearly, the terms and conditions in this mining licence can only govern those activities that take place within the mining licence area. However it would be artificial to only describe those activities that fall precisely within the geographical area of the mining licence, even though the activity itself continues onto adjacent land eg the extended pit. Accordingly the figures attached to this Annex show both the mining licence area and where appropriate the immediately adjacent land. The mining licence boundary is however clearly marked.

Once the second stage is completed the following elements will apply:

- Pit area - approximately 50 hectares
- Pit depth - approximately 255 metres
- Pit floor level - approximately RL 910¹
- Pit length x breadth - approximately 860 x 600 metres
- Total waste rock volume - approximately 26 million BCM
- Total ore processed - approximately 19 million tonnes
- Total tailings - approximately 17 million m³
- Two tailings storage facilities - Storage 2 and 1A. Storage 1 design will be modified and Storage 1A will be constructed. This will have a completed height at approximately RL 166 and cover approximately 70 hectares. On completion of mining Storage 2 and 1A are to be rehabilitated by returning the slopes of the embankments to grass and native vegetation. The tailings ponds will be partly capped and partly developed into wetlands.

As with the first stage of development waste rock and overburden together with ore will be conveyed from the pit to the waste disposal area and process plant area by way of the conveyor. The conveyor is to be extended by about 500m at the waste disposal area and a new truck loading station will be built. The conveyor belt is to be increased in width from 1 metre to 1.35 metres.

Similarly, waste water will be treated in the water treatment plant prior to discharge to the Ohinemuri River

The capacity of the process plant will be increased to handle up to 1.25 million tonnes per annum.

Because the first stage of development described above is near to completion, the construction activities described below relate to the second stage of development only. At the same time as construction activities take place with respect to the second stage of development, operational activities relating to the first stage of development will be ongoing. The operational period refers to both the first and second stages of development.

Third Stage: Continued Waihi Operations

The third stage of development involves amendments to the Martha Pit design. The design for the Martha Pit has been adjusted over the years since 1998, as is usually the case for an operational mine with varying ground conditions being encountered and further mineral reserves located.

More recently, the amendments to the Martha pit design have been focussed on ensuring the pit walls are left in a safe and stable state in preparation for closure (as required by condition 36), particularly in light of stability issues arising from historic unfilled underground workings.

The south wall stability cutback and layback to the east wall of the Martha pit result in an overall pit shape that is more favourable from a stability perspective. Further amendments may need to be made to the pit design to ensure, based on the increased knowledge on surrounding ground conditions and the nature of historic underground workings, so that the pit walls are left in a safe and stable state at closure.

All amendments to the pit design have been, and will continue to be, approved by the Peer Reviewers, as required by condition 7A.

In the same way as the second stage of development, the third stage of development of the Martha pit is both within the mining licence area and partly outside that area. Land use consent has been obtained from the Hauraki District Council for that part of the pit that falls outside the mining licence area, and Mining Permit 41 808 covers the small amount of ore obtained from the Martha pit that is outside the mining licence area.

Additional mineral reserves have also been located within the Waihi Epithermal District refer Plan A resulting in the Favona Underground Mine, the Trio Underground Mine, and applications to explore

the remnant resource beneath the Martha open pit with a view to mining this should it prove viable. It is possible that further exploration in the Waihi Epithermal District may result in further economic mineral deposits being located.

These new mines (and potential future mines) use the existing operational infrastructure provided for by the mining licence, including stockpile areas, the processing plant, water treatment plant and the waste disposal area.

As part of the third stage of development, the crest height of Storage 1A may be increased to a completed height of approximately 177.25.

As was noted for the second stage of development, the terms and conditions in this mining licence can only govern those activities that take place within the mining licence area. However, it would be artificial to describe only those activities that fall precisely within the geographical area of the mining licence when the mining activities continue into adjacent land. The mining licence boundary is however clearly marked.

At the expiry of the mining licence in 2017, the following elements will generally apply:

- Pit area - approximately 51.1 hectares
- Pit depth - approximately 275 metres
- Pit floor level – RL890 (mine datum)
- Pit length x breadth – approximately 960m x 770m
- Total waste rock volume – approximately 40 million BCM
- Total ore processed – approximately 30 million tonnes
- Total tailings – approximately 28 million m³

THE CONSTRUCTION PERIOD (STAGE 2)

The Open Pit and its Surface Facilities

1. The second stage of development will be preceded by a programme of timbering and clearing. A contractor will be employed to cut down and truck merchantable timber to a lumber mill. The area will be approximately 20 hectares, of which 8 hectares is within the mining licence and the remaining area is on immediately adjacent land.
2. Immediately following the timber clearing, the area will be grubbed of bush and stumps.

3. The existing mine surface facilities will be relocated during this period. The facilities include workshops, change room, sample preparation area, offices and a car park. The existing crusher will be replaced by a new jaw crusher and feeder breaker located near Junction Road, east of the existing facilities. The new location for these facilities is outside the mining licence area.
4. The waste rock and overburden excavated will be used for the construction of noise and screening bunds around the pit area. Two noise bunds are proposed, one adjacent to Grey Street and the other at the western end of the extended pit. Both noise bunds fall partly within the mining licence area and partly on immediately adjacent land. In addition waste rock and overburden will be stockpiled for post-mining use adjacent to the pit surface facilities (and outside the mining licence area) or transported by the overland conveyor to the waste disposal area.

The Conveyor System

5. The existing conveyor system will be used. The belt of the conveyor will be widened from 1m to 1.35m and will travel at the same speed i.e. 19 km/hr. The conveyor will be extended by about 500m at the waste disposal area.

The Process Plant

6. The existing process plant will be upgraded by adding a new pre-leach thickener to increase slurry density and another leach tank together with minor modifications to control instrumentation, the mill generally and the gold room.

Tailings and Waste Disposal

7. The "footprint" of the southern tailings storage facility ("Storage 1A") will be cleared of organic matter and topsoil. The topsoil will be stockpiled and revegetated for later use in rehabilitation.
8. The extensive system of drains for Storage 1A will then be excavated and constructed followed by the excavation and construction of cut-off trenches around the tailings and waste disposal area for seepage control. The drainage system, in conjunction with cut-off trenches backfilled with relatively impermeable materials, will ensure that any potentially contaminated water draining from the tailings or the mine waste can be intercepted and pumped to a holding pond.

9. The initial embankment of the Storage 1A will be constructed from on-site borrow material or from waste rock stripped from the open pit.

THE OPERATIONAL PERIOD (STAGES 1, 2 AND 3)

The Open Pit

10. Access to the pit workings will be by a ramp on a 10% downgrade which will start adjacent to a pit services area on the eastern edge of the pit. Road access to the service area and the open pit will be via Junction Road. Ore and waste rock removed from the open pit will be transported by conveyor to the process plant or waste disposal area.
11. Design of the proposed open pit has been based on selection of overall slope angles projected from the economic base of the pit to surface. These final slope angles are intended to result in maximum ore recovery consistent with slope stability.
12. The selected overall pit slopes take account of geological variation and are as follows:
- in fresher rock, 43°,
 - reducing to 40° in softer zones,

Refer to Figure 2.1 for overall pit slopes.

13. The pit slope angles are designed conservatively, and will be refined as the pit is developed and more information is obtained during operation.

Pit Development

14. The first stage of development of the pit is almost complete.
15. Waste rock is mined in 5 metre benches and in the ore zones the bench heights are reduced to approximately 2.5 metres to allow selectivity of ore from internal waste rock. Catch berms are located generally at 15 metre vertical intervals.
16. During the second stage of development of the pit excavation will occur in the following sequence:

- Quarters 1-8: Central pit will provide the main ore supply, while the south wall is developed. The excavation of the north wall commences.
- Quarters 9-12: Central pit excavations reduce with the south wall becoming the main ore supplier. Large volumes of waste rock are removed from the north wall.
- Quarters 13-16: The north wall overtakes the south wall as the main ore supplier.
- Quarters 17-28: The north wall is the sole mining area until excavations reach the central pit and the south wall excavations. Final excavations to RL 910m.
- Refer Figure 2.1 for the indicative final pit.

17. The Martha Mine contains extensive old underground workings. While the vertical extent of these workings is partially known, old records and maps showing the extent of filling, timbering and open stopping are incomplete. During mine life, every precaution will be taken to ensure that men and equipment are located in a safe working environment. It may be necessary to drill ahead of mining in some areas, known from exploration to contain open voids, to identify the depth and location of the voids.

Extraction Methods

18. A combination of methods of extraction will be used depending on the characteristics of the material being mined. Diamond drilling, coupled with geologic interpretation, has identified material on the basis of whether it is diggable, rippable or blastable. Proportions of each vary from the upper levels to the lower levels of the proposed pit although the rock generally becomes more competent and harder with depth.

Digging

19. Altered rock classed as diggable represents approximately 10 percent of the waste to be removed. As the material is soft, hydraulic backhoes or front end loaders will dig and load this material. Where a transition takes place between waste types, it may be necessary to assist the digging by ripping.

Ripping

20. Approximately 15 percent of the material to be extracted from the second stage of development can be recovered by either digging with a hydraulic excavator or by first loosening the rock by ripping and then digging.

Blasting

21. Material in the open pit defined as other than diggable or rippable will require blasting before it can be extracted. This will amount to approximately 75 percent of the material to be mined.
22. Blasting practices, such as low charge weights and the use of millisecond delays will limit peak particle velocities for ground vibration and will be used.

Open Pit Mining Activities

Ore Mining

23. The process plant is to be upgraded to treat up to a nominal 3,800 tonnes per day working continuously (nominally up to 1.25m tonnes per year). Sufficient equipment will be scheduled to achieve ore mining rates that will maximise the amount of ore available.
24. The gold bearing quartz veins in the Martha Mine have been amenable to mining using a hydraulic backhoe. As the mine deepens, it is necessary to blast tighter quartz to facilitate digging with the excavator.
25. The ore will be loaded into haul trucks and taken to a storage area adjacent to the conveyor loading point or tipped directly into the crusher hopper.
26. Ore will be mined in approximately 2.5m lifts to facilitate ore grade control. Ore mining will be preceded by mapping, sampling and geologic interpretation to define ore and waste rock boundaries. Good mining practice will reduce dilution by barren waste to a minimum.
27. In some areas it is anticipated that small gold bearing quartz veins will continue into the final walls of the open pit. Where this occurs and ground conditions are suitable these veins will be mined for short distances by simple underground methods. To maintain overall pit slope stability the voids created will be supported by permanent rock pillars or by back filling with waste rock from the open pit.

Waste Rock Mining

28. Generally equipment will be scheduled to achieve waste mining tonnages sufficient to maintain ore feed to the process plant. It is anticipated that the equipment required will be sized to produce approximately 3000 tonnes per hour.

29. Removal of waste will vary with the types of rock being moved. Waste will be mined either by:
- direct loader extraction
 - ripping with a large bulldozer and loading
 - drilling and blasting and loading
30. The material will either be loaded directly into trucks or in the case of ripped material will be pushed to a loader for loading.
31. After loading, the waste will be crushed for conveying to the waste disposal area or alternatively stockpiled within the open pit.

Rock Sizing and Conveying

32. When to be removed from the open pit, all ore and waste rock will be crushed and then placed on a belt conveyor for transport to the process plant (ore) or to the waste disposal area.

Ancillary Mine Service Activities

33. In addition to the actual extraction and ore removal activities the open pit working areas and the mining equipment have to be maintained.
34. All working areas, temporary haulage ramps and pit access roads will be regularly graded to provide good traction in all weather conditions. In dry weather a water wagon will be used to wet down these working areas so as to reduce fugitive dust emissions. Irrigation sprays will be used on other exposed areas as required to prevent the generation of fugitive dust.
35. All services such as fuelling, lubrication and machinery maintenance will be performed in the pit working areas or in the pit surface facilities area.

Dewatering

36. The old Martha Mine workings were full of water to an elevation of approximately RL1115 (a RL of 0 (mine datum) is 1000m below sea level). To allow mining to take place below this level the old mine has been dewatered.
37. Pipelines along the conveyor route will convey water for reuse, treatment and discharge, and return river water to the open pit for lake filling at closure.

Operating Hours

38. The open pit mine and the conveyor system are scheduled to operate 12 hours per day from Monday through Friday and five hours on Saturday.
39. However, when weather conditions or other circumstances provided for in condition 19(d) cause production rates to fall below schedule it will be necessary to work the open pit for up to 14 hours per day from 7.00am to 9.00pm Monday - Friday.

Services

40. Water reticulation for mine and general offices will be serviced from the town water supply. A sewage disposal unit is provided on site. Power is supplied from the national grid for distribution within the pit and for rock sizing and dewatering.

Rehabilitation

41. At the end of mining operations the dewatering pumps will be removed and the void created will refill with water (groundwater and stormwater). It is proposed to augment the filling of the pit by taking water from the Ohinemuri River. After a period of approximately five years a new lake will be created. This will be rehabilitated into a recreational area in accordance with the approved Rehabilitation and Closure Plan.

Mine to Process Plant Conveyor and Project Administration Office

Conveyor Route

42. Ore and waste rock removed from the open pit will pass through a crusher and on to a marshalling conveyor and on to an overland conveyor system.
43. The overland conveyor system runs in a straight line directly to the process plant area and then to the waste disposal area. The conveyor passes under Grey Street and State Highway 25.
44. After passing beneath State Highway 25 the route enters the Union Hill area where it rises to ground level, and then enters a tunnel driven through Union Hill.

- 45. From the eastern end of the tunnel the conveyor passes over open farm land at ground level directly to the process plant.
- 46. At the process plant ore is directed to a stockpile by a tripper and stacking conveyor, while waste rock remains on the conveyor and is transported across the Ohinemuri River to a truck loading facility in the waste disposal area.
- 47. Access is provided along the conveyor route to permit daily inspection, maintenance and spillage clean up.

Project Administration

- 48. The project administration Offices for both the construction and operational phases will be situated at a site within the Waihi Ward of the Hauraki District Council.
- 49. Deleted
- 50. Deleted

The Process Plant

- 51. The general process plant layout is shown in Figure 2.7. Physical facilities are located above the 100m contour to minimise flood risk from the river. Access to the plant and waste disposal areas is by way of Baxter Road and the access road which crosses the Ohinemuri River east of the plant site.

Process Description

- 52. The plant consists of a conventional carbon-in-pulp (CIP) gold and silver process plant. It will be upgraded to treat up to 1.25 million tonnes of ore per annum.
- 53. Ore from the overland conveyor will be discharged onto a coarse ore pad. This coarse ore stockpile material will be fed into a semi-autogenous grinding (SAG) mill and secondary ball mill circuit. The ground ore in slurry form will be pumped to a series of cyanide leach and carbon adsorption tanks for dissolution of the gold and silver which is then adsorbed onto the activated carbon.

54. The, carbon is removed from the circuit and the remaining slurry which is barren of economically recoverable gold and silver is pumped to the tailings storage area. The carbon which is loaded with gold and silver is chemically washed to remove the gold and silver which are then recovered by electrowinning. The remaining barren solution is recycled to the leach tanks. The precipitated gold and silver are smelted to produce bullion bars and the slag from the smelting process is returned to grinding circuits.
55. The process plant area has its own maintenance workshop and warehouse facility together with an office and a change house. The whole process plant area is security fenced.

Waste Water Treatment

56. The process plant area serves as a central point for all waste water from the mining licence area. A waste water treatment plant is located within the process plant area to treat, as required, all excess water prior to its discharge to the Ohinemuri River.

Operating Hours

57. The process plant is a continuous operation which operates 24 hours per day, seven days per week.

Services

58. Power is supplied to the process plant from the national grid. Emergency battery powered lighting is available.
59. External lighting is provided for safety and security purposes.
60. The major water requirements for operation of the plant include water for process, fire protection, potable uses and, if required, dust control. Process water needs are met by mine dewatering and tailings pond and internal solution recycling. Potable water for the plant site is from the town supply.

The Tailings and Waste Disposal Area

61. Mining activities generate mine waste rock and process plant tailings which require disposal in safe permanent storages.

62. Tailings generated at the process plant will be piped to the disposal area where they will be discharged into the tailings storage/facilities (Storage 2 and 1A).
63. The area for disposal of the mine waste and tailings lies to the east of the Ohinemuri River in the vicinity of Baxter Road.
64. The general arrangement of the tailings and waste disposal scheme is shown in Figure 2.8. Access to the disposal area and the process plant will be from Baxter Road.
65. The proposed disposal scheme will utilise mine waste to confine the process plant tailings and is designed to accommodate only material originating from the Waihi Epithermal District. The proposed scheme has a nominal storage capacity of approximately 40 million BCM of mine waste and 28 million m³ of tailings.
66. Two tailings storage areas, designated Storage 1A and Storage 2, will be provided to allow flexibility in operation and to allow rehabilitation of one of the tailings surfaces to commence before ore treatment operations cease.
67. The structural embankments which will confine the tailings will be constructed of selected mine waste. Water will be prevented from ponding against the embankments by the tailings beach except under extreme rainfall conditions during the first years of operation when the developed area of the tailings beach will be small. At this stage the level of the tailings will be low in relation to the embankment dimensions.
68. Mine waste not suitable for use in the construction of the structural embankments and mine waste in excess of construction requirements will be placed in stockpiles. The outer slopes proposed for the waste disposal areas which typically will not exceed 1 vertical in 3.9 horizontal will be revegetated as early as possible.
69. Unoxidised mine waste will be sealed using oxidised mine waste to inhibit the rate of water movement and oxygen diffusion into the waste. A layer of loose oxidised waste will be placed on the final slopes of the waste disposal areas to encourage revegetation.
70. A holding pond for decant water from the surface of the tailings will be provided. The holding pond embankments will be constructed of selected mine waste rock.

71. Surface water from the surface of the tailings storage areas and seepage water emerging from the drainage system installed beneath the tailings storage and waste disposal areas will be pumped to the treatment facility.
72. Potentially contaminated water will be returned by pipeline to the process plant from the holding pond at the disposal area. Safeguards will be incorporated in the pumping systems and along the pipeline route to prevent the escape of tailings or return water into the Ohinemuri River in the event of pipeline failure.
73. Topsoil for use in rehabilitation will be stockpiled during the construction and waste disposal operation.
74. Construction of Storage 1A will commence at the beginning of the second stage of development with simultaneous placement of mine waste in the structural and bulk fill zones. (Storage 2 is being constructed and will reach its final dimensions around 2000).
75. During construction and waste disposal operations a bund will be maintained around the perimeter of the disposal area. The bund will act as a silt trap to reduce the amount of suspended solids carried off the site in storm runoff.
76. In general the permanent components of the proposed disposal scheme have been located above the 100m elevation. This is above the high flood level of the Ohinemuri River over this reach.

Rehabilitation

77. The waste and tailings disposal area will be rehabilitated in accordance with the approved Rehabilitation and Closure Plan to grass and native vegetation and wetlands (with permanent ponds). This will be achieved by staged revegetation of final slopes of the disposal area as soon as disposal operations allow. Stockpiled topsoil will be used to the maximum benefit in rehabilitation.

DISPOSAL TECHNIQUE

Mine Waste

- (i) Delivery

78. Mine waste will be delivered to the waste disposal area by the overland conveyor. To allow flexibility in the selection of materials on site mine waste will be hauled and placed by trucks or scrapers from a loading facility at the conveyor termination point.

79. The conveyor will be extended to near the top of Storage 2 to minimise haul distances.

(ii) Embankment Construction

80. Selected mine waste will be used for the construction of the structural zone of the tailings confining embankments. (See Figure 2.10).

81. Construction of the confining embankments is an integral part of waste disposal operations. Therefore, construction must continue throughout the year at a rate dictated by mine waste production.

82. Material selection will be achieved by co-ordination of mining and waste disposal. As far as practicable construction materials will be placed and compacted at close to the optimum water content for compaction. The properties of the compacted waste will be monitored to ensure that the embankment complies with the design requirements.

83. Waste disposal operations will be monitored to ensure that conditions which might prejudice the stability of the tailings storage facilities are not allowed to develop.

(iii) Runoff Control

84. Cross falls will be maintained on all construction surfaces to ensure water does not pond on the construction areas.

85. Vegetation will be established as rapidly as possible to stabilise the final surfaces and silt traps will be maintained to reduce the amount of suspended solids carried off the site in storm runoff.

Tailings Management

86. Tailings will be deposited in the storage areas by the subaerial method. The key elements in this method are drainage, cyclic disposition of thin layers of tailings and removal of supernatant water and incidental rainfall.

(i) Drainage

87. The results of the site investigation indicate that the ash and tephra units underlying the storage areas will be more permeable than the tailings and that these units will have the

capacity to carry water emerging from the base of the tailings to the basin drainage system installed at the base of the units.

(ii) Deposition

88. Tailings will be pumped to the storage areas from the mill as a slurry with an expected solids content of about 40% by mass.
89. At the storage area the distribution pipeline will be laid on a bench on the upstream face of the confining embankment. This distribution pipeline will be equipped with off-takes to discharge just above the tailings surface.
90. On discharge into the tailings storage the tailings solids will settle out of the water to form a beach sloping away from the discharge point. The water released from the slurry will flow down the beach to a pond at the low point of the storage.
91. The discharge location will be changed regularly to ensure that even disposition of thin layers of tailings will be achieved over the available beach areas. The importance of cyclic deposition is that it allows settling and initial consolidation of thin layers to take place rapidly and exposes the beaches to the beneficial effects of air drying.

(iii) Decant

92. Water will be removed from the tailings surface by pumping from the holding pond.

Operating Hours

93. The waste disposal operation is scheduled to operate for 12 hours per day (0700 to 1900 hours) Monday to Friday and five hours on Saturday (0700 to 1200 hours). However, operations will need to be extended to 9.00pm (Monday to Friday) when inclement weather conditions or other circumstances provided for in condition 19d) have caused delays either in the open pit or in the waste disposal area.

94. Tailings disposal like the process plant operations will take place 24 hours per day.

Ancillary Services

95. Power for the conveyors and pumps will be supplied from the national grid to the process plant and thence to the waste disposal area.

Landscaping

96. During construction and operations the open pit, overland conveyor, process plant site and waste disposal area will be screened as appropriate to limit the visual impact of the project.

Air Quality

97. A network of dust monitoring samplers has been established around the licence area to measure dust levels. This consists of high volume air samplers and British standard dust deposition gauges.

UNDERGROUND ACTIVITIES

98. The underground operations may use the surface facilities associated with the existing operations.

Operating Hours

99. Underground operations may be carried out 24 hours per day, seven days per week.

Rehabilitation

100. The stopes shall be backfilled with waste rock. The portals and shafts shall be plugged or otherwise blocked off. Reflooding of the workings will occur naturally from groundwater recharge once dewatering has ceased, and will also occur as part of the lake formation.

Plans

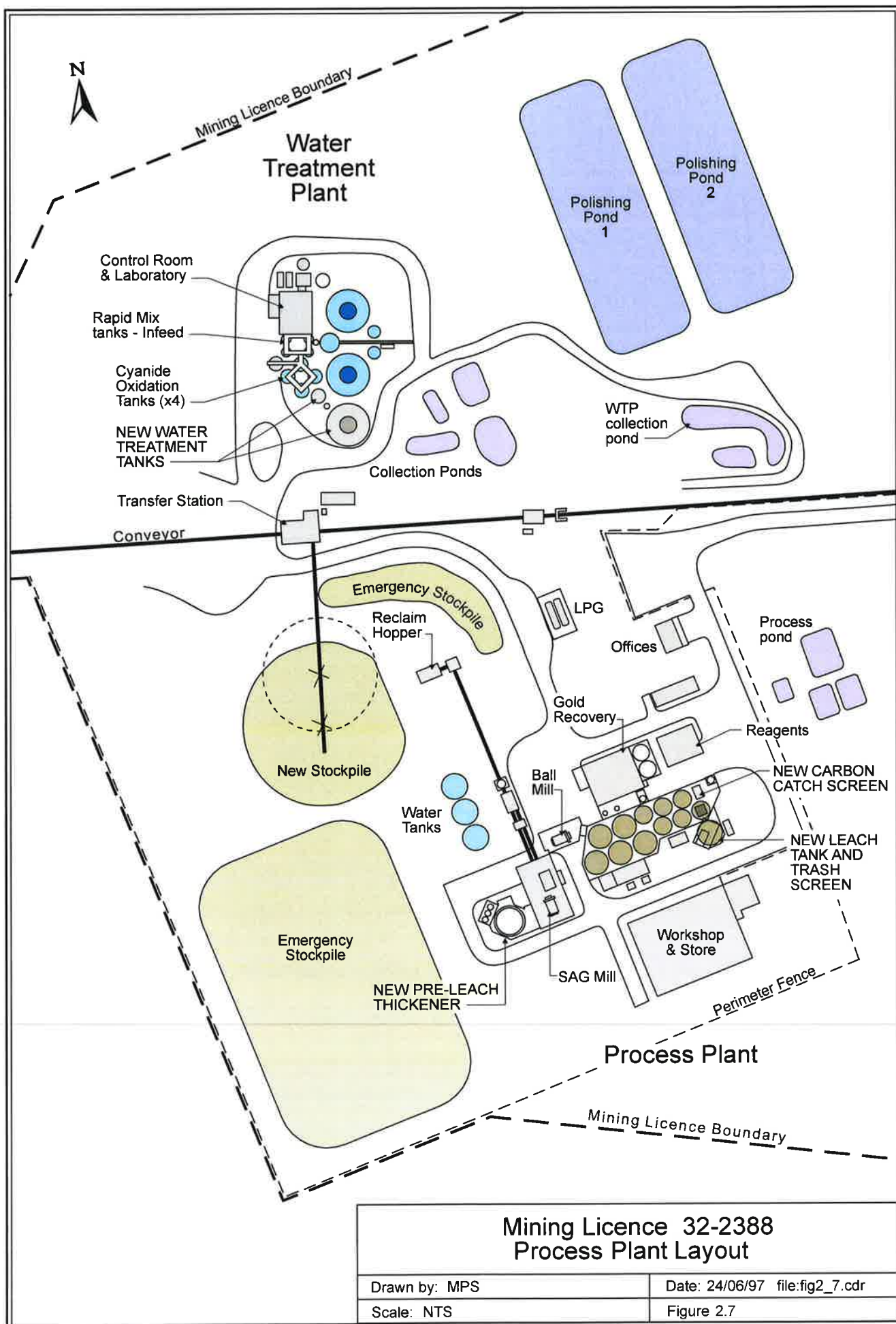
Figure 2.1 Indicative Final Pit

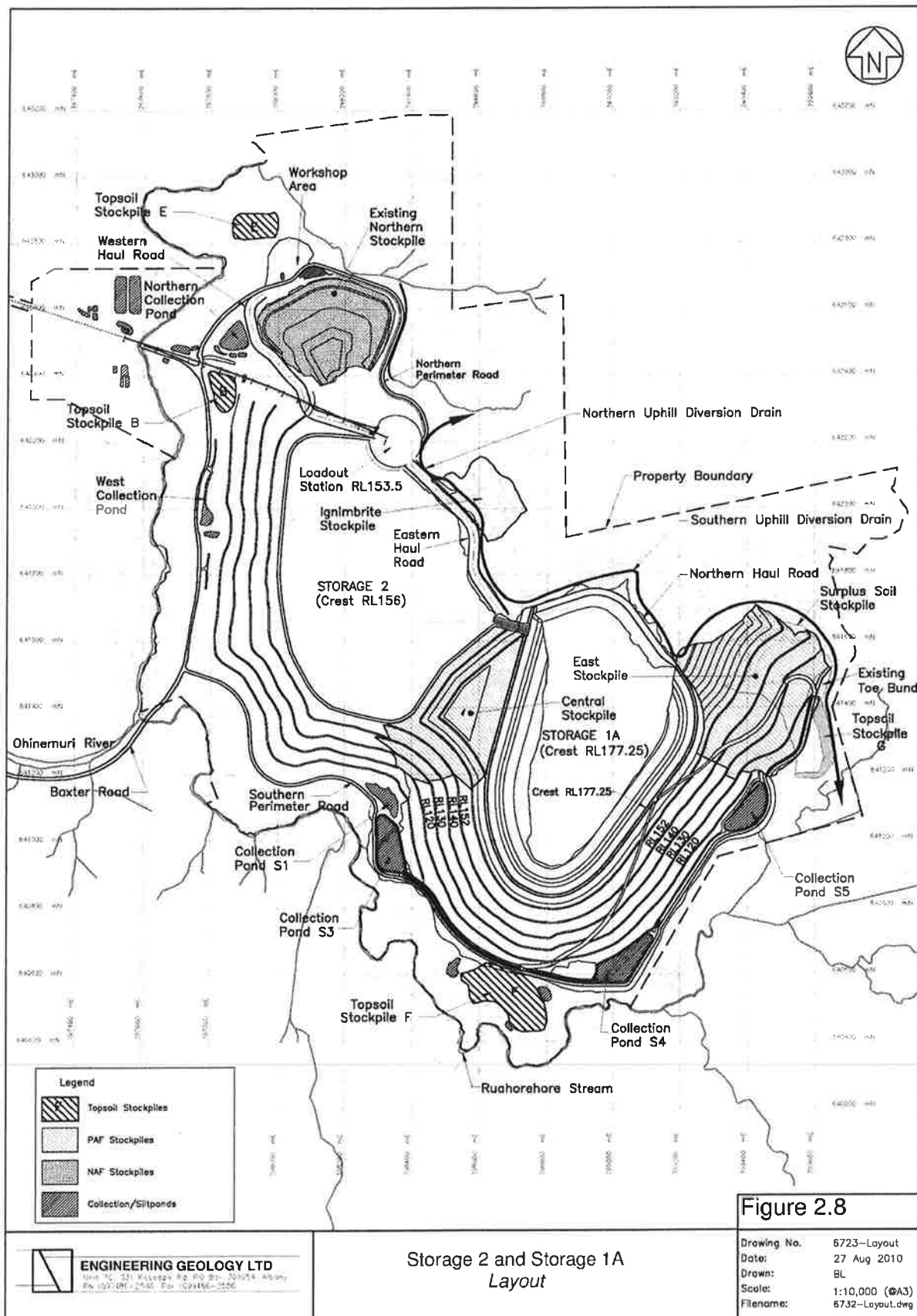
Figure 2.7 Process Plant Layout

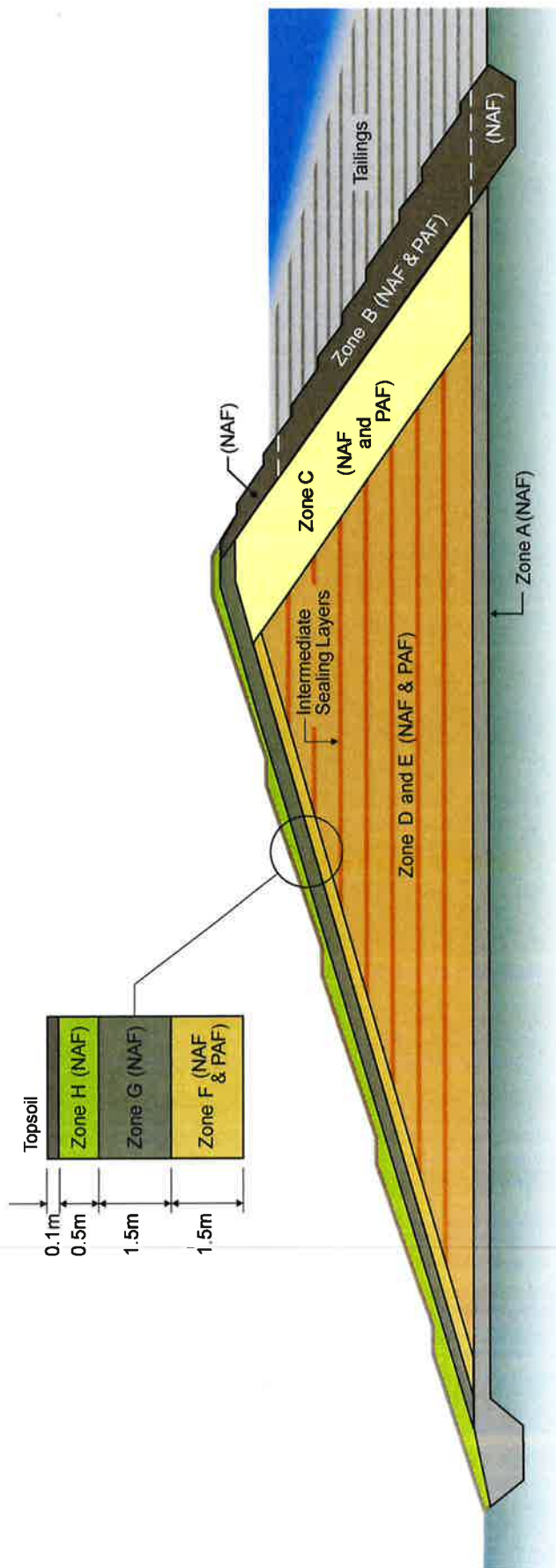
Figure 2.8 Storage 2 and 1A Layout

Figure 2.10 Typical Section - Waste Storage Embankment

Plan A Waihi Epithermal District







Note: NAF = Non Acid Forming
PAF = Potentially Acid Forming

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Typical Section - Waste Storage Embankment		
Drawn by: MPS	Date: 24/06/97	file: fig2_10.cdr
Scale: NTS	Figure 2.10	

