Memorandum

To: Michael Proctor
From: Siamak Pahlevanzadeh
Mt Garnet Mining Project
Subject: Tailings Storage Facility - TSF2
Geotechnical Investigation
Date: 11 May 2015
Our Ref: 111282.13M01-b

1 INTRODUCTION

1.1 Background

Consolidated Tin Mines (CSD) owns and operates the Mt Garnet project. Mt Garnet is located approximately 200km by road south west of Cairns in North Queensland. Significant infrastructure associated with the Mt Garnet leases includes an open cut mine pit, underground mine, process plant, tailings storage facility (TSF) and sediment dam.

A key component of the Mt Garnet project is the containment of process residue, which is currently managed by an existing Tailings Storage Facility (TSF), formed within an incised valley comprising an unnamed tributary of Nanyeta Creek. To the south of the TSF, buttressing the main embankment a mine waste rock dump exists. A sediment dam is located downstream from the waste rock dump.

The Mt Garnet site is licenced under Environmental Authority (EA) EPML00974913 effective from 21 October 2011. Mining leases covered by this EA are ML4042, ML4043, ML4044, ML4130 and ML20016.

As a part of the forecast processing activities at the Mt Garnet site, it is recognised that CSD will require an additional TSF with concept details of the new TSF (referred to as TSF2, being adjacent to the west of the existing Tailings Storage Facility) provided in ATCW (2014). To address the above, ATC Williams Pty Ltd (ATCW) carried out a geotechnical site investigation program as part of the detail design work for the proposed TSF2, with the preliminary findings of this program described herein. The final report will be issued in May 2015.

1.2 Description of Proposed Development

The proposed TSF2 Development Starter Embankment (Stage 1) will be constructed using typical embankment construction techniques. The Stage 2 raise, expected to occur in 2017, will be formed by downstream lifting of the existing starter embankment. Engineered rock filling will be used for embankment construction, expected to be sourced from quarrying works within the storage extents.

The final configuration of the TSF2 following completion of the Stage 2 Development works (i.e. on completion of Stage 2) would comprise:
\[ \begin{align*}
  &\bullet \text{ Embankment crest level} \quad RL \, 691.0m \\
  &\bullet \text{ Spillway invert level} \quad RL \, 690.0m \\
  &\bullet \text{ Spillway width} \quad 15.0m \\
  &\bullet \text{ Total Embankment length (Major plus Minor)} \quad 850m \\
  &\bullet \text{ Major Embankment length} \quad 750m \\
  &\bullet \text{ Maximum embankment heights} \\
  &\quad \cdot \text{ Major Embankment} \quad 36.5m \\
  &\quad \cdot \text{ Minor Embankment} \quad 11.0m \\
  &\bullet \text{ Embankment crest width} \quad 10.0m \\
  &\bullet \text{ Storage Area (at full supply level)} \quad 17.5ha \\
  &\bullet \text{ Ultimate Storage Capacity} \quad 2,016ML
\end{align*} \]

1.3 **Scope of Geotechnical Investigation**

In preparation to undertake feasibility study and detailed design for the proposed TSF2, ATC Williams Pty Ltd (ATCW) has undertaken a geotechnical site investigation during 23 to 27 March 2015. The objective of the investigation was to determine the subsoil profile within the proposed embankment footprint, and to determine the competency of available site materials to be used as suitable embankment construction material. Soil samples were taken from test pits within the proposed TSF2 embankment footprint and storage area. In addition, drilling and Insitu permeability testing was carried out by Rob Lait & Associates (RLA), with results of these works presented herein and in RLA (2015) report.

This memorandum presents a geotechnical evaluation of the TSF2 proposed site, and preliminary results of the geotechnical investigation program.

2 **SITE DESCRIPTION**

2.1.1 **Site Topographic and Hydrology**

The Mt Garnet Project is located south of the Mount Garnet township. The region comprises hilly terrain with numerous rocky outcrops and predominant land uses include cattle grazing and mining.

The project area is situated within a sub-catchment of the Herbert River, which discharges to the Coral Sea. Within the site area, the ephemeral drainage system flows into the main site drainage channel named Return (Nanyeta) Creek which flows in a south-easterly direction to Herbert River (Plate 1). The site catchment is significantly disturbed, due to previous mining activity and the surface is described as generally rocky. Vegetation in undisturbed areas consists of woodland to open forest.
2.1.2 Site Geology

Mt Garnet is located in the southern portion of the Siluro-Devonian Hodgkinson Province, dominated by sedimentary sequences which reduce in age towards the east into basalt flows and tuffaceous volcanic sequences. The Siluro-Devonian sequence sits non-conformably on the Precambrian metamorphics which are in turn non-conformably overlain by middle to upper Carboniferous sequences, locally referred to as the Nanyeta Volcanic Synchronous with deposition of these volcanics, granitoids such as the Elizabeth Creek Granite intruded the sequence, accompanied by the formation of hydrothermal base metal and tin-tungsten mineralisation.

An erosional cycle has predominated since the Permian with the deposition of perched sediments and extrusion of olivine basalts in the Tertiary and early Quaternary.

The valley in which the TSF, Waste Rock Dump and Sediment Dam are sited comprises Paleozoic sediments comprising medium to coarse grained moderately to thickly bedded arkose. Occasional finer grained, micaceous sediments are intercalated within the arkose. Within the floor of the valley, the arkose is overlain by a layer of up to 6.0m thick of alluvial/colluvial clays.

Along the ridge of the eastern hills a steeply west dipping cal-silicate (skarn) unit outcrops over a length (north-south) of some 500m and width of some 50m. Mineralisation is hosted exclusively within this unit. A second larger skarn and parallel to the first, outcrops approximately 600m to the west of the first skarn.
Weathering and oxidation within the arkose is highly variable but generally does not exceed a depth of 10 to 15 metres, and may be fresh from surface. The calc-silicate appears to be oxidised to a depth of approximately 20 metres where well mineralised.

2.1.3 Hydrogeological Setting

Hydrostratigraphy investigations at the Mount Garnet site have previously been carried out by Rob Lait & Associates (RLA, 2011). The following aquifer sequences are associated with the lease:

- Minor alluvial aquifer, limited in extent to a localised area surrounding Return (Nanyeta) Creek consisting coarse and sandy materials; and
- Highly weathered basement aquifer located 30-40m below ground surface - generally comprised of weathered acid volcanic rocks with aquifer sequences comprised of clayey materials of low permeability; and
- Deeply fractured rock basement aquifer underlying the entire lease at depths greater than 50m below ground surface. This rock basement aquifer is developed through rhyolite and dacite sequences with generally low permeabilities.

In addition to these aquifers, an upper colluvial aquifer is located to the south and east of the existing TSF. Located at approximately 20m depth, and comprising moderate permeability clayey gravel and decomposed sandstones, the upper colluvial aquifer is associated with existing seepage from the TSF.

3 GEOTECHNICAL INVESTIGATION PROGRAM

Geotechnical investigation for the site included excavation of seven (37) test pits together with borehole drilling, to facilitate permeability testing/groundwater level measurement. The purpose of the test pitting program was to characterize surface (upper) soils occurring within the site in terms of excavatability, suitability for use as engineered/low permeability fill, volume of suitable materials, and to characterize subgrade strength and permeability as a foundation for the embankment. Also undertaken was some sampling of the existing TSF tailings to verify the material parameters previously assumed for these tailings.

Summary details of this program are as follows:

3.1.1 Test Pitting Program

A test pitting program with material sampling for laboratory testing was undertaken within the proposed embankment footprint, storage and potential borrow areas to assess/identify:

- Foundation conditions for the TSF2 embankment and storage floor; and
- Sources of clay borrow materials for the embankment and storage lining.

The test pits were logged visually by Geotechnical Engineer from ATCW (refer Attachment 2), and representative samples were collected for laboratory testing. A plan of the test pit locations is included as Attachment 1.

3.1.2 Drilling and Permeability Testing

As outlined in section 1, a drilling and permeability testing program was also carried out by RLA as part of geotechnical investigation, with bore locations shown in Attachment 1. Insitu permeability testing, by rising and falling head test methods was undertaken by RLA on a number of groundwater bores, with results of this work presented in Attachment 3. Testing comprised evacuation of the bores via pumping, or filling with water, and then under both conditions.
monitoring the change in level over time.

These bores were drilled using air percussion down-the-hole hammer techniques, and logged for lithology and relevant soil/rock characteristics.

3.1.3 Investigation of Tailings

Sampling of the existing TSF tailings materials was carried out to verify the material parameters. A suit of laboratory tests is ongoing on tailings samples at the time of preparation of this memorandum. This will provide a greater degree of certainty around the consolidated/desiccated densities that could be achieved for TSF2. The laboratory tests being undertaken on tailings samples are as follows:

- Liquid limit
- Plastic limit
- Plasticity index
- Particle density (Specific Gravity)
- Particle size distributions
- Tray settling test
- Shrinkage limit density

3.1.4 Soil Laboratory Testing

A suit of laboratory testing to address the above requirements has been ordered, with these tests being ongoing at the time of preparation of this Memo. The laboratory tests being undertaken on soil samples from test pits are as follows:

- Moisture content
- Atterberg Limits
- Emerson Class
- Particle size distributions
- Maximum Dry Density (incl. Standard compaction)
- Triaxial (CU)
- Permeability

4 PRELIMINARY GEOTECHNICAL EVALUATION

As outlined in Section 1, the objective of the investigation was to determine the subsoil profile within the proposed embankment footprint, and to determine the competency of available material to be used as suitable embankment construction material.

Following receipt of all laboratory test results, interpretation will be completed to address the scope of works related to characterisation of site conditions. The results of the investigation works and interpretation will be presented as a factual geotechnical report.

This section presents a preliminary geotechnical evaluation of the TSF2 site, based on observations and visual classifications of the geotechnical conditions on site.

4.1 Surface Soil

Surface soils (Topsoil) containing roots and organics appeared to cover the majority of the site and were of 200 to 450mm thickness. These soils were predominantly sandy/silty and are likely to be susceptible to sheet flow erosion when exposed. These soils possessed no engineering value and, when containing any proportion of organics, should be stripped from areas proposed for construction filling.
4.2 Sub-Soil Units

The subsoil units encountered within the investigation area were generally of significant extent and approximately 2.0m to 3.0m thickness. These soils were described as sandy clay or clayey sand; however, are generally clay/silt dominant and are considered to be relatively consistent across the site. The materials were of intermediate plasticity, with Liquid Limit values estimated visually to be ranging from 25% to 45%, and were generally classified as CI in accordance with the AS1726. Insitu permeability achieved for the soils, tested under field conditions, as reported by RLA (refer Attachment 3), are low to very low, falling within the range of $10^{-8}$ to $10^{-10}$ m/s.

These subsoil unit materials were generally considered suitable for use as low permeability fill for embankment construction and/or clay liner subject to availability of required volume of suitable material. Placement and compaction of these materials should be carefully controlled, as a result, to reduce the potential for internal erosion or piping to occur, and to achieve appropriately low levels of permeability.

4.3 Basement Unit

The basement sequences encountered within the investigation area are geotechnically competent, varying from weak-to-medium strength and extremely-to-moderately weathered with depth. It was considered that some excavation into this horizon may be required to form cut-off trenches. Below this level, larger plant or specialised attachments (e.g. rippers or rock breakers) may be required. Any materials excavated from the upper basement would likely be coarse-grained in nature and should therefore have application as rock fill or filter material for embankment construction.

4.4 Evaluation Summary

The sub-soils observed during field investigations were generally consistent between test locations with some variations. The subsoil profile under the proposed TSF2 embankment footprint generally comprises various intermediate to high plasticity clays, sandy clays and gravelly clays, followed by gravelly sandy weathered rock material. An increase in depth was generally associated with an increase in sand and gravel content. No groundwater seepage was encountered in any of the test pits. Insitu permeability tests carried out by RLA on a number of groundwater bores shows low to very low permeability.

From the field investigation program, it is inferred that intermediate or high plasticity clays exist across the site area with varying thickness. The test pit geotechnical logs from the field investigation are presented in Attachment 2. The logs are prepared based on visual classification of the material encountered within the test pits and will be updated upon receipt of laboratory testwork certificates.

Regards,

SIAMAK PAHLEVAZADEH  
Principal Engineer  
ATC Williams Pty Ltd

Ralph Holding  
Principal Engineer  
ATC Williams Pty Ltd

End.  
Attachment 1 - Test Pit Location Plan  
Attachment 2 - Test Pit Logs  
Attachment 3 - Drilling and Permeability Logs
### Test Pit Number TH-01

**Client:** Consolidated Tin Mines  
**Project Name:** TSF 2 Site Investigation  
**Job Number:** 111282.13  
**Project Location:** Mt Garnet

**Date Started:** 24/3/15  
**Groundwater:** Weathered Rock  
**Equipment:** Komatsu PC 450LC  
**Hole Size:** 5m x 1.5m

---

### Details

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Sample Type</th>
<th>Test</th>
<th>Remarks</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Borehole TH-01 terminated at 2.4m.

---

### Materials Description

- **Soil:** Typ: Sandy Clay with Gravel, brown mottling, black, moist  
- **Rock:** Clayey Sand, low plasticity, pale gray mottling, white

---

**Log by:** SP  
**Checked by:** RH

---

**Location:** Mt Garnet  
**Easting (m):** 298954  
**Northing (m):** 8043405

---

**ATC Williams Pty Ltd**  
222-225 Beach Road, Mordialloc, VIC 3195  
Tel: (03) 8587 0900 Fax: (03) 8587 0901  
email: mel@atcwilliams.com.au
**Material Description:**

- **Soil:** TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).
- **Rock:** TYPE, WEATHERING, colour, fabric, estimated strength, structure/bedding.

**Log:**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Soil Type</th>
<th>Sample Type</th>
<th>Test</th>
<th>Remarks</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Topsoil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Clayey Sand, low plasticity, gray, moist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sandy Clay, low plasticity, brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Weathered Rock, brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Borehole TH-02 terminated at 2.4m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional Observations:**

- Sample lost
- Sample disturbed

**Bore Completion Details:**

- **Location:** Mt Garnet
- **EASTING (m):** 299318
- **NORTHING (m):** 8043224
- **Sample Type:** Water
- **Sample Tests:** Sample lost, Sample disturbed
- **Remarks:**
  - % Finer than 0.075mm
  - Plasticity Index (I_P) (%)
  - Liquid Limit (w) (%)
  - Natural Moisture (w) (%)
  - Undrained Strength
  - Undrained Shear Strength
  - % Fine (%)
  - % Very Fine (%)
  - % Coarse (%)
  - % Very Coarse (%)
  - % Rock (%)
  - % Clay (%)
  - % Silt (%)
  - % Organic Matter (%)
  - % Residue (%)

**Groundwater:**

- **DATE STARTED:** 24/3/15
- **EQUIPMENT:** Komatsu PC 450LC
- **HOLE SIZE:** 5m x 1.5m
- **LOGGED BY:** SP
- **CHECKED BY:** RH
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Topsoil: **
- Soil: TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).

**Borehole TH-03 terminated at 0.65m**

---

**Drilling Method**
- Test Pit Number TH-03

**Material Description:**
- Weathered Rock, Clayey Sand, low plasticity, brown and red

---

**Groundwater**
- DATE STARTED: 24/3/15
- LOCATION: Mt Garnet
- GROUNDWATER
- HOLE SIZE: 5m x 1.5m
- EQUIPMENT: Komatsu PC 450LC

---

**Test Pit Number TH-03**

**PROJECT NAME:** TSF 2 Site Investigation

**PROJECT LOCATION:** Mt Garnet

---

**LOGGED BY:** SP
**CHECKED BY:** RH

---

**Additional Observations**
- LOCATION: Mt Garnet

---

**Log:**
- EASTING (m) 299482
- NORTING (m) 8042777
- DATE: 8/5/15

---

**GROUNDED IN DESIGN**
- ATC Williams Pty Ltd
- 222-225 Beach Road, Mordialloc, VIC 3195
- Tel: (03) 8587 0900 Fax: (03) 8587 0901
- email: mel@atcwilliams.com.au

---

**PROJECT NAME:** TSF 2 Site Investigation
**PROJECT LOCATION:** Mt Garnet

---

**GROUNDED IN DESIGN**
- ATC Williams Pty Ltd
- 222-225 Beach Road, Mordialloc, VIC 3195
- Tel: (03) 8587 0900 Fax: (03) 8587 0901
- email: mel@atcwilliams.com.au
# Test Pit Number TH-04

**Location:** Mt Garnet  
**Client:** Consolidated Tin Mines  
**Job Number:** 111282.13  
**Project Name:** TSF 2 Site Investigation  
**Project Location:** Mt Garnet

<table>
<thead>
<tr>
<th>Date Started</th>
<th>R.L. Surface (m)</th>
<th>Datum</th>
<th>Location</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/3/15</td>
<td></td>
<td></td>
<td>Mt Garnet</td>
<td>Komatsu PC 450LC</td>
</tr>
</tbody>
</table>

**Groundwater**

---

### Material Description:

- **Topsoil:** Low plasticity, pale brown mottling orange
- **Weathered Rock:** Borehole TH-04 terminated at 2m

### Additional Observations

- **Location:** Mt Garnet

---

### Details

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Soil Type</th>
<th>Gravel Log</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Remarks</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**  
- Soil: TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).  
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Sample Type</th>
<th>Remarks</th>
<th>Tests</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Topsoil**

- Clayey Sand, low plasticity, brown and orange
- Weathered Rock, gray and brown
- Borehole TH-06 terminated at 1.9m
<table>
<thead>
<tr>
<th>Material Description:</th>
<th>Graphical Log</th>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Sample Tests</th>
<th>Remarks</th>
<th>Plasticity Index (I_P) (%)</th>
<th>Liquid Limit (w_L) (%)</th>
<th>Natural Moisture (w_M) (%)</th>
<th>% Finer than 0.075mm</th>
<th>Bore Completion Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topsoil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandy Clay, Roots at 0.5m, low plasticity, dark brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weathered Rock, Refusal at 2.2m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Borehole TH-07 terminated at 2.2m</td>
</tr>
</tbody>
</table>
**Material Description:**

- **Topsoil:**
  - Clay, medium plasticity, brown and orange mottling white

- **Weathered Rock, Refusal at 1.8m**

- **Borehole TH-08 terminated at 1.8m**
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Soil Type</th>
<th>Tests</th>
<th>Remarks</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Topsoil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Highly Weathered Rock logged as Clayey Gravel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Weathered Rock, Refusal at 2.0m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Borehole TH-09 terminated at 2m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drilling Method**

- Topsoil
- Highly Weathered Rock
- Weathered Rock, Refusal at 2.0m
- Borehole TH-09 terminated at 2m
<table>
<thead>
<tr>
<th>Datum</th>
<th>R.L. Surface (m)</th>
<th>Datum</th>
<th>Easting (m)</th>
<th>Northing (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATUM</td>
<td>R.L. SURFACE</td>
<td>DATUM</td>
<td>EASTING</td>
<td>NORTHING</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>299023</td>
<td>8043180</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Material Description:**
- **Soil:** TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).
- **Rock:** TYPE, WEATHERING, colour, fabric, estimated strength, structure/bedding.

**Samples Tests Remarks**

**Additional Observations**

**Bore Completion Details**

**Logging Method**
- Topsoil
- Medium to High Plasticity Clay
- Weathered Rock

**Drilling Method**
- **Hole Size:** 5m x 1.5m
- **Equipment:** Komatsu PC 450LC
- **Drilling Method:**
  - **Equipment:**
  - **Date Started:** 24/3/15
  - **Date Completed:**
  - **Groundwater:**
  - **Location:** Mt Garnet
  - **Easting:** 299023
  - **Northing:** 8043180

**Test Pit Number TH-10**

**Test Pit Logs**
- **Sample Tests:**
- **Remarks:**
- **Additional Observations:**

**Additional Details**
- **PROJECT NAME:** TSF 2 Site Investigation
- **PROJECT LOCATION:** Mt Garnet
- **CLIENT:** Consolidated Tin Mines
- **JOB NUMBER:** 111282.13
- **LOGGED BY:** SP
- **CHECKED BY:** RH
- **EASTING:** 299023
- **NORTHING:** 8043180
- **DATE:** 8/5/15

**Contact Information**
- ATC Williams Pty Ltd
- 222-225 Beach Road, Mordialloc, VIC 3195
- Tel: (03) 8587 0900 Fax: (03) 8587 0901
- email: mel@atcwilliams.com.au
- **PROJECT NAME:** TSF 2 Site Investigation
- **PROJECT LOCATION:** Mt Garnet
- **CLIENT:** Consolidated Tin Mines
- **JOB NUMBER:** 111282.13
- **LOGGED BY:** SP
- **CHECKED BY:** RH
- **DATE:** 8/5/15

**Test Pit Number TH-10**

**Test Pit Logs**
- **Sample Tests:**
- **Remarks:**
- **Additional Observations:**

**Additional Details**
- **PROJECT NAME:** TSF 2 Site Investigation
- **PROJECT LOCATION:** Mt Garnet
- **CLIENT:** Consolidated Tin Mines
- **JOB NUMBER:** 111282.13
- **LOGGED BY:** SP
- **CHECKED BY:** RH
- **DATE:** 8/5/15

**Contact Information**
- ATC Williams Pty Ltd
- 222-225 Beach Road, Mordialloc, VIC 3195
- Tel: (03) 8587 0900 Fax: (03) 8587 0901
- email: mel@atcwilliams.com.au
Topsoil

Medium Plastic Clay with Sand, dark red and brown

Weathered Rock

Borehole TH-11 terminated at 2m
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Sample Type</th>
<th>Test Remarks</th>
<th>Plasticity Index (I_p) (%)</th>
<th>Liquid Limit (w_l) (%)</th>
<th>Natural Moisture (w_n) (%)</th>
<th>% Finer than 0.075mm</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Weathered Rock, Refusal at 2.0m</td>
<td>Sample lost</td>
<td>sample disturbed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Topsoil**

Clay, medium plasticity, red and brown mottling, black

**Weathered Rock, Refusal at 2.0m**

Borehole TH-12 terminated at 2m

**Material Description:**
- Soil: TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding)
- Rock: TYPE, WEATHERING, colour, fabric, estimated strength, structure/bedding

**Additional Observations**

- Location: Mt Garnet
- Date Started: 24/3/15
- HOLE SIZE: 5m x 1.5 m
- DRILLING METHOD: 
  - Sampling:
  - Water
- GROUNDWATER:
  - GROUNDWATER: 
  - DATE STARTED: 24/3/15
  - COMPLETED: 
  - EQUIPMENT: Komatsu PC 450LC
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Soil Particle Size</th>
<th>Samples</th>
<th>Tests</th>
<th>Remarks</th>
<th>Natural Moisture (%)</th>
<th>Plasticity Index (I_P) (%)</th>
<th>Liquid Limit (w_L) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Type:**
- **Water**

**Groundwater**

**Drilling Method**

**HOLE SIZE:** 5m x 1.5 m

**Equipment:** Komatsu PC 450LC

**LOCATION:** Mt Garnet

**DATE STARTED:** 24/3/15

**COMPLETED:**

**DATUM:**

**Sample Lost**

**Sample Disturbed**

**Additional Observations**

**Borehole Completion Details**

---

**Material Description:**

- **Topsoil**
  - Gravel with Sand, pale brown

- **Weathered Rock**
  - Borehole TH-13 terminated at 1.85m
### Material Description:
- **Topsoil**
- **Clay, medium to high plasticity, red and gray**
- **Weathered Rock**

**GROUNDED IN DESIGN**

- **ATC Williams Pty Ltd**
  - 222-225 Beach Road, Mordialloc, VIC 3195
  - Tel: (03) 8587 0900 Fax: (03) 8587 0901
  - email: mel@atcwilliams.com.au

**PROJECT NAME**
- TSF 2 Site Investigation

**PROJECT LOCATION**
- Mt Garnet

**DATE STARTED**
- 24/3/15

**GROUNDWATER**
- Location: Mt Garnet

**EQUIPMENT**
- Komatsu PC 450LC

**HOLE SIZE**
- 5m x 1.5m

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water Sample Type</th>
<th>Samples Tests</th>
<th>Remarks</th>
<th>Additional Observations</th>
<th>Bore Completion Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Test Pit Number TH-15

**Client:** Consolidated Tin Mines  
**Project Name:** TSF 2 Site Investigation  
**Project Location:** Mt Garnet  
**Job Number:** 111282.13

**Date Started:** 25/3/15  
**GROUNDWATER Location:** Mt Garnet  
**Hole Size:** 5m x 1.5m

**Drilling Method**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Soil Type</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Topsoil</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sandy Clay, medium to high plasticity, brown and gray</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Weathered Rock, Refusal at 2.0m</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Borehole TH-15 terminated at 2m</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Observations**

- **Location:** Mt Garnet
- **Material Description:**
  - **Soil:** Type, USCS Symbol, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding)
  - **Rock:** Type, Weathering, colour, fabric, estimated strength, structure/bedding

**Logs**

- **Graphical Log**
- **Sample Tests**
- **Remarks**

**Grounded in Design**

ATC Williams Pty Ltd  
222-225 Beach Road, Mordialloc, VIC 3195  
Tel: (03) 8587 0900 Fax: (03) 8587 0901  
email: mel@atcwilliams.com.au  

**Project Name:** TSF 2 Site Investigation  
**Project Location:** Mt Garnet  
**Client:** Consolidated Tin Mines  
**Job Number:** 111282.13  
**Graphical Log:** TP-LOGS.GPJ  GINT AUSTRALIA.GDT 8/5/15
Material Description:

- Soil: TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>% Finer than 0.075mm</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Remarks</th>
<th>Additional Observations</th>
<th>Borehole Completion Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Borehole TH-16 terminated at 1.5m.
### Test Pit Number TH-17

**Date Started:** 25/3/15  
**Completed:**  
**Groundwater:**  
**Drilling Method:**  
**Hole Size:** 5m x 1.5m  
**Equipment:** Komatsu PC 450LC  
**Location:** Mt Garnet  
**Easting (m):** 299091  
**Northing (m):** 8043142  
**Logged By:** SP  
**Checked By:** RH

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Graphical Log</th>
<th>Samples Tests Remarks</th>
<th>Plasticity Index (IP) (%)</th>
<th>Liquid Limit (w) (%)</th>
<th>Natural Moisture (w) (%)</th>
<th>% Finer than 0.075mm</th>
<th>References</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.60</td>
<td></td>
<td></td>
<td>Measured depth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional Observations:**
- **Material Description:**
  - Soil: TYPE, USCS SYMBOL, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding)
  - Rock: TYPE, WEATHERING, colour, fabric, estimated strength, structure/bedding

**Borehole Completion Details:** Borehole TH-17 terminated at 1.6m
Material Description:

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Remarks</th>
<th>Plasticity Index (I_P) (%)</th>
<th>Liquid Limit (w_I) (%)</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Topsoil, Roots
  - Clayey Sand, low plasticity, brown, red and orange
  - Weathered Rock; gray and white; Refusal at 2.15m

Borehole TH-18 terminated at 2.15m
### Material Description:

**Soil:** Type, USCS Symbol, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).

**Rock:** Type, weathering, colour, fabric, estimated strength, structure/bedding.

**Topsoil**

Sandy Clay, medium to high plasticity, red and brown

Weathered Rock, refusal at 2.2m

Borehole TH-19 terminated at 2.2m
## Test Pit Number TH-20

**Client:** Consolidated Tin Mines  
**Project Name:** TSF 2 Site Investigation  
**Project Location:** Mt Garnet  
**Job Number:** 111282.13  

### Details

<table>
<thead>
<tr>
<th>Plasticity Index (I&lt;sub&gt;P&lt;/sub&gt;) (%)</th>
<th>Liquid Limit (w) (%)</th>
<th>Natural Moisture (w) (%)</th>
<th>% Finer than 0.075mm</th>
<th>Drilling Method</th>
<th>HOLE SIZE</th>
<th>EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>15</td>
<td>10</td>
<td>50</td>
<td><strong>Topsoil</strong></td>
<td>5m x 1.5m</td>
<td>Komatsu PC 450LC</td>
</tr>
</tbody>
</table>

### Additional Observations

- **Topsoil:** Clayey gravel, brown and orange, with boulders
- **Weathered Rock:** Refusal at 1.8m; gray
- Borehole TH-20 terminated at 1.8m
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Soil Type</th>
<th>Drilling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>Topsoil</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>Boulders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weathered Rock, Refusal at 1.8m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Borehole TH-21 terminated at 1.8m</td>
<td></td>
</tr>
</tbody>
</table>
GROUNDS:  
- **Topsoil**: Sandy Clay, medium to high plasticity, dark brown  
- **Weathered Rock**: Refusal at 2.7m. Borehole TH-22 terminated at 2.7m.
### Material Description:

- **Topsoil, Roots and Grass Present**
- **Sandy Clay, medium plasticity, red and gray**
- **Weathered Rock; pale gray and brown; Refusal at 2.0m**

**Borehole TH-23 terminated at 2m**
**Material Description:**

- **Topsoil:** Sandy Clay, high plasticity, red, brown and gray
- **Sandy Clay, medium plasticity, brown:**
- **Weathered Rock logged as Clayey Sand, gray and orange. Refusal at 2.6m:**

**Borehole TH-24 terminated at 2.6m**
Topsoil, Roots and Grass Present

Sandy Clay, high plasticity, dark brown and gray

Clayey Sand with Gravel, pale gray

Weathered Rock, gray

Borehole TH-25 terminated at 2m
### Material Description:

- **Soil**: Type, USCS Symbol, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding)
- **Rock**: Type, Weathering, colour, fabric, estimated strength, structure/bedding

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Topsoil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Clayey Sand**: brown and orange

- **Weathered Rock**: brown, Refusal at 2.8m

- Borehole TH-26 terminated at 2.8m
Topsoil
Sandy Clay, medium to high plasticity, dark brown and red

Sandy Clay, medium plasticity, with Gravel, pale brown and orange

Weathered Rock, Refusal at 2.5m
Borehole TH-27 terminated at 2.5m
### Material Description:

- **Topsoil**: Clay/Sandy, medium plasticity, dark brown and red
- **Clayey Sand**: Pale brown and orange
- **Weathered Rock**: Refusal at 2.0m

**Borehole TH-28 terminated at 2m**

---

### Drill Completion Log

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Additional Observations

- **LOCATION**: Mt Garnet
- **EASTING**: 299114
- **NORTHING**: 8043449

---

### Details

- **Drilling Method**: Komatsu PC 450LC
- **HOLE SIZE**: 5m x 1.5 m
- **DATE STARTED**: 25/3/15
- **EQUIPMENT**: Komatsu PC 450LC
- **GROUNDWATER**: Sample lost / Sample disturbed
- **SAMPLE TYPE**: Water

---

### Project Details

- **CLIENT**: Consolidated Tin Mines
- **PROJECT NAME**: TSF 2 Site Investigation
- **PROJECT LOCATION**: Mt Garnet
- **JOB NUMBER**: 111282.13
- **PROJECT LOCATION**: Mt Garnet
- **DATE STARTED**: 25/3/15
- **DATE COMPLETED**: 

---

### Contact Information

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au

---

**CLIENT**: Consolidated Tin Mines

**PROJECT NAME**: TSF 2 Site Investigation

**PROJECT LOCATION**: Mt Garnet

**DATE STARTED**: 25/3/15

**DATE COMPLETED**: 

**EQUIPMENT**: Komatsu PC 450LC

**HOLE SIZE**: 5m x 1.5 m

**GROUNDWATER**: Sample lost / Sample disturbed

**SAMPLE TYPE**: Water

---

### Test PIT NUMBER TH-28

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Additional Observations

- **LOCATION**: Mt Garnet
- **EASTING**: 299114
- **NORTHING**: 8043449

---

### Details

- **Drilling Method**: Komatsu PC 450LC
- **HOLE SIZE**: 5m x 1.5 m
- **DATE STARTED**: 25/3/15
- **EQUIPMENT**: Komatsu PC 450LC
- **GROUNDWATER**: Sample lost / Sample disturbed
- **SAMPLE TYPE**: Water

---

### Project Details

- **CLIENT**: Consolidated Tin Mines
- **PROJECT NAME**: TSF 2 Site Investigation
- **PROJECT LOCATION**: Mt Garnet
- **JOB NUMBER**: 111282.13
- **PROJECT LOCATION**: Mt Garnet
- **DATE STARTED**: 25/3/15
- **DATE COMPLETED**: 

---

### Contact Information

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au
**Material Description:**

- **Soil:** Type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition (structure/bedding).
- **Rock:** Type, weathering, colour, fabric, estimated strength, structure/bedding.

**Graph Log**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests Remarks</th>
<th>Plasticity Index (I_p) (%)</th>
<th>Liquid Limit (w_l) (%)</th>
<th>Moisture (w) (%)</th>
<th>Additional Observations</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional Observations**

- Borehole TH-29 terminated at 2.1m
**Material Description:**
- **Sandy Clay**, medium plasticity, dark brown and red
- **Clayey Sand with Gravel**, brown
- **Weathered Rock**, brown and gray

*Graphical Log*

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Sample Type</th>
<th>Tests</th>
<th>Remarks</th>
<th>Plasticity Index (I_p) (%)</th>
<th>Liquid Limit (w_I) (%)</th>
<th>% Finer than 0.075mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 - 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 - 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 - 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 - 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 - 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Additional Observations*

*Drilling Method*

- **Topsoil**
- **Sandy Clay**, medium plasticity, dark brown and red
- **Clayey Sand with Gravel**, brown
- **Weathered Rock**, brown and gray

*Borehole TH-30 terminated at 2.5m*
Details

<table>
<thead>
<tr>
<th>Plasticity Index (I_p) (%)</th>
<th>Liquid Limit (w_I) (%)</th>
<th>Natural Moisture (w) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DATUM**

<table>
<thead>
<tr>
<th>R.L. SURFACE (m)</th>
<th>Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Type**

- Water

**Depth (m)**

<table>
<thead>
<tr>
<th>Depth (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

**Additional Observations**

- Borehole TH-31 terminated at 2.9m

**Material Description**

- Topsoil, Roots and Grass present
- Sandy Clay, medium to high plasticity, dark brown
- Clayey Sand with Gravel, brown and orange
- Weathered Rock, Mudstone

---

**GROUNDED IN DESIGN**

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
email: mel@atcwilliams.com.au

**PROJECT NAME**

TSF 2 Site Investigation

**PROJECT LOCATION**

Mt Garnet

**CLIENT**

Consolidated Tin Mines

**JOB NUMBER**

111282.13

**LOGGED BY**

SP

**CHECKED BY**

RH

**DATE STARTED**

25/3/15

**HOLE SIZE**

5m x 1.5m

**GROUNDWATER**

Sample lost

Sample disturbed

**EQUIPMENT**

Komatsu PC 450LC

**LOCATION**

Mt Garnet

**EASTING (m)**

299276

**NORTHING (m)**

8043372

**DATE**

8/5/15

**GROUNDED IN DESIGN**

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au

**PROJECT NAME**

TSF 2 Site Investigation

**PROJECT LOCATION**

Mt Garnet

**JOB NUMBER**

111282.13

**CLIENT**

Consolidated Tin Mines

**LOGGED BY**

SP

**CHECKED BY**

RH

**DATE**

8/5/15

**GROUNDED IN DESIGN**

ATC Williams Pty Ltd
222-225 Beach Road, Mordialloc, VIC 3195
Tel: (03) 8587 0900 Fax: (03) 8587 0901
e-mail: mel@atcwilliams.com.au
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Water</th>
<th>Samples</th>
<th>Remarks</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DATING METHOD**

- **Topsoil**
- **Sandy Clay, medium to high plasticity, orange**
- **Clayey Sand, brown**
- **Weathered Rock, gray and brown, Refusal at 2.65**
  - Borehole TH-32 terminated at 2.65m
**Topsoil**
- Sandy Clay, medium plasticity, with Gravel, brown

**Sandy Clay**

**Clayey Sand**

**Weathered Rock, gray**

Borehole TH-33 terminated at 2.1m
CLIENT: Consolidated Tin Mines

PROJECT NAME: TSF 2 Site Investigation

JOB NUMBER: 111282.13

PROJECT LOCATION: Mt Garnet

DATE STARTED: 26/3/15

GROUNDWATER: Location Mt Garnet

EQUIPMENT: Komatsu PC 450LC

HOLE SIZE: 5m x 1.5 m

LOGGED BY: SP

CHECKED BY: RH

LOCATION: Mt Garnet

GROUNDED IN DESIGN: ATC Williams Pty Ltd

PROJECT NAME: TSF 2 Site Investigation

PROJECT LOCATION: Mt Garnet

JOB NUMBER: 111282.13

CLIENT: Consolidated Tin Mines

TEST PIT NUMBER TH-34

GROUNDED IN DESIGN: ATC Williams Pty Ltd

ATC BOREHOLE WITH BORE COMPLETION TP LOGS GPJ GINT AUSTRALIA GDT 5/5/15
### Material Description:

**Soil:**
- Type: Topsoil
- Description: Sandy Clay, medium to high plasticity, brown and gray and orange

**Rock:**
- Type: Weathered Rock
- Description: Gray, Refusal at 2.1m

**Clayey Sand:**
- Description: Medium to high plasticity

**Borehole TH-35:**
- Terminated at 2.1m
Topsoil. Grass and Roots Present
Sandy Clay, boulders present, medium to high plasticity, dark brown and orange

Clayey Gravel, with Sand, brown, boulders present
Weathered Rock, Refusal at 2.0m
Borehole TH-36 terminated at 2m
Topsoil
Sandy Clay, medium plasticity, brown

Clayey Gravel, boulders present, brown

Weathered Rock, brown and gray
Borehole TH-37 terminated at 1.9m
Borehole No: MGGWB16  
Client: Consolidated Tin Mines Ltd

Location: TSF2  
Date Drilled: 26/3/2015

Easting: 299082  
Nothing: 8043714

Method: Rotary Air (RC)  
Driller: AED

Depth (m)  
Symbol

Strata Description

0  
Clayey silt, mottled, red, brown, yellow
Silty topsoil, light brown
Metapelite, light brown, silty, weathered, soft
Blocky, dark grey, metapelite, fractured, occasional calcite veins and sericitisation
Metasiltstone, dark grey, minor quartz and calcite veining
Fractured zone, moist
Blocky, dark grey, metapelite, fractured, occasional calcite veins and sericitisation
Metapelite, dark grey, fractured, moist
Metaarenite, dark grey, fractured, moist, grey-green veining 7 sericite

Well Construction Details

Grouted annulus
BENTONITE
Surface to 49m, 100mm ID PN12 PVC CASING
153mm Borehole
5 - 7mm diameter rounded gravel
37 to 49m, 100mm ID SLOTTED PN12 PVC CASING
BOTTOM CAP, 100mm Class 18 PVC

Notes:

Datum:MGA94
Consolidated Tin Mines Ltd, Mt Garnet TSF2 Groundwater investigation
GPS coordinates only, should be confirmed by survey
Slug Test Analysis Report

Project: Mt Garnet TSF2
Number: 224
Client: Consolidated Tin Mines Ltd

Location: Mt Garnet
Slug Test: MGGWB16
Test Well: MGGWB16
Test Conducted by: Alan McDonald
Test Date: 3/04/2015
Analysis Performed by: Bouwer & Rice
Analysis Date: 3/04/2015

Aquifer Thickness: 15.00 m

Calculation using Bouwer & Rice

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB16</td>
<td>$5.79 \times 10^{-3}$</td>
</tr>
</tbody>
</table>
Borehole No: MGGWB17  
Location: TSF2  
Easting: 298986  
Northing: 8042933  
Method: Rotary Air (RC)  
Driller: AED

Client: Consolidated Tin Mines Ltd  
Project No: NG256

Depth (m)  
Symbol  
Strata Description  
Well Construction Details

0  
Grouted annulus

5  
BENTONITE

10  
Surface to 59m, 100mm ID PN12 PVC CASING

15  
153mm Borehole

20  
5 - 7mm diameter rounded gravel

25  
47-59m, 100mm ID SLOTTED PN12 PVC CASING

30  
BOTTOM CAP, 100mm Class 18 PVC

35  
Backfill

40

45

50

55

60

65

End of Borehole at 59m

Notes:

Datum: MGA94
Consolidated Tin Mines Ltd, Mt Garnet TSF2 Groundwater investigation
GPS coordinates only, should be confirmed by survey
Slug Test Analysis Report

Project: Mt Garnet TSF2
Number: 224
Client: Consolidated Tin Mines Ltd

Location: Mt Garnet
Slug Test: MGGWB17
Test Well: MGGWB17
Test Conducted by: Alan McDonald
Test Date: 3/04/2015
Analysis Performed by: Bouwer & Rice
Analysis Date: 3/04/2015

Aquifer Thickness: 1.00 m

Calculation using Bouwer & Rice

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB17</td>
<td>$2.69 \times 10^{-5}$</td>
</tr>
</tbody>
</table>
Borehole No: MGGWB18  
Client: Consolidated Tin Mines Ltd  
Location: TSF2  
Date Drilled: 28/3/2015  
Easting: 298730  
Northing: 8043296  
Method: Rotary Air (RC)  
Driller: AED  
Project No: NG256  
Elevation (m):  

**Strata Description**

- **Clay Grey mottled**
- **Metasediments weathered white/brown soft**
- **Mudstone grey soft**
- **Mudstone black broken**  
  *soak 0.2 l/s*
- **Mudstone black blocky firm/hard**

**Well Construction Details**

- **Grouted annulus**
- **Standing water level 11.44m when drilled**
- **BENTONITE**
- **Surface to 37m, 100mm ID PN12 PVC CASING**
- **153mm Borehole**
- **5 - 7mm diameter rounded gravel**
- **25 to 37m, 100mm ID SLOTTED PN12 PVC CASING**
- **BOTTOM CAP, 100mm Class 18 PVC**

**Notes:**

Datum:MGA94  
Consolidated Tin Mines Ltd, Mt Garnet TSF2 Groundwater investigation  
GPS coordinates only, should be confirmed by survey
Slug Test Analysis Report

Location: Mt Garnet
Slug Test: MGGWB18
Test Well: MGGWB18

Test Conducted by: Alan McDonald
Test Date: 3/04/2015

Analysis Performed by: Bouwer & Rice
Analysis Date: 3/04/2015

Aquifer Thickness: 15.00 m

Calculation using Bouwer & Rice

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB18</td>
<td>$1.14 \times 10^{-1}$</td>
</tr>
</tbody>
</table>
Slug Test Analysis Report

Location: Mt Garnet  
Slug Test: MGGWB16  
Test Well: MGGWB16  
Test Conducted by: Alan McDonald  
Test Date: 3/04/2015  
Analysis Performed by: Bouwer&Rice  
Analysis Date: 3/04/2015  
Aquifer Thickness: 15.00 m  

Calculation using Bouwer & Rice

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB16</td>
<td>$5.79 \times 10^{-3}$</td>
</tr>
</tbody>
</table>
Location: Mt Garnet  
Slug Test: MGGWB17  
Test Well: MGGWB17

Test Conducted by: Alan McDonald  
Test Date: 3/04/2015

Analysis Performed by: Bouwer & Rice  
Analysis Date: 3/04/2015

Aquifer Thickness: 1.00 m

Calculation using Bouwer & Rice

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB17</td>
<td>$2.69 	imes 10^{-5}$</td>
</tr>
</tbody>
</table>
 Slug Test Analysis Report

Project: Mt Garnet TSF2
Number: 224
Client: Consolidated Tin Mines Ltd

Location: Mt Garnet
Slug Test: MGGWB18
Test Well: MGGWB18
Test Conducted by: Alan McDonald
Test Date: 3/04/2015
Analysis Performed by: Bouwer&Rice
Analysis Date: 3/04/2015

Aquifer Thickness: 15.00 m

<table>
<thead>
<tr>
<th>Observation Well</th>
<th>Hydraulic Conductivity [m/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGGWB18</td>
<td>$1.14 \times 10^{-1}$</td>
</tr>
</tbody>
</table>

Calculation using Bouwer & Rice

![Graph showing time vs. h/h0](image-url)