TASMANIA DEPARTMENT OF RESOURCES & ENERGY
DIVISION OF MINES AND MINERAL RESOURCES

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URBAN GEOLOGICAL MAPPING PROJECT

REPORT 1

Engineering geology of the Greater Hobart area

by P. J. Hofto, D. J. Sloane, and B. D. Weldon

DIVISION OF MINES AND MINERAL RESOURCES, PO BOX 56, ROSNY PARK, TASMANIA 7018

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INTRODUCTION

The Geodata Project was jointly funded by the City Councils of Hobart, Clarence and Glenorchy, by the Municipality of Kingborough, and by the Division of Mines and Mineral Resources. The two-year project endeavoured to produce applied geological data and explanatory notes for use as base information when planning urban development in the above municipalities. It must be stated that the information provides a general overview and in no way should be considered as replacing site-specific information and investigation.

This publication was produced in conjunction with two 1:25 000 Engineering Geology Maps covering the Greater Hobart area. Together they provide basic geological and geotechnical information and advice for engineers, planners and local government personnel.

The Appendices to this report contain summarised information from the Division of Mines and Mineral Resources published and unpublished reports and databases. The databases contain summaries of geotechnical, construction material and groundwater information, as well as reports concerning site-specific investigations.

Increasing regulation within the building industry and planning authorities, and the ever present question of liability, has meant that more emphasis will now be placed on specific building codes. For example, Australian Standard 2870-1986, *Residential Slabs and Footings*, outlines general design principles for foundation conditions commonly found in Australia. The building authorities, in this case the cities and municipalities, are expected to provide preliminary advice on site classification. The easiest way to provide this advice is by producing an engineering geology map which shows site characteristics. It must be stressed however that these maps present only preliminary site classification and information, and **in no way negate the need for individual site investigations** by competent specialists.

ENGINEERING GEOLOGICAL MAPS

Engineering Geological Maps have much in common with geological maps, as both present information about the geological environment. However engineers or planners may require more specific information. Conventional geological maps group units of similar age and origin. Engineering geological maps commonly include descriptions and qualifications of specific physical and engineering properties of rocks and soils, as well as information concerning groundwater conditions. They may also indicate how soils and rocks may behave with respect to erosion and instability.

Geological maps provided the fundamental basis for the engineering geological mapping. Reconnaissance of the area, assessment of available information and the addition of new geological, geomorphological and geodynamic data form the basis of the accompanying engineering maps. Samples were collected for laboratory study, and general survey mapping was supplemented by geophysical information and subsurface sampling using portable drills and augers. Type sections were logged, sampled and photographed for later reference. Detailed field mapping and sampling were also undertaken in areas designated for major development or regions with recognised geotechnical problems. The maps were produced at a scale of 1:25 000, using the Department of Environment and Planning 1:25 000 topographic maps as bases. This engineering geological survey aimed to produce maps on which units are defined by engineering properties. The boundaries of these units generally follow rock-type boundaries, but may bear no relation to either geological structure or stratigraphic boundaries. Many stratigraphic and structural boundaries within main units have been excluded on the accompanying maps for this reason. Recognition of rock and soil boundaries was often difficult in the field because changes in the character of rocks and soil are often gradational and can occur both horizontally and vertically. Other boundaries may be covered by slope deposits or fill, and topsoil subsequently placed there.

Faulting of geological units may be of fundamental importance to the engineer. However, the position of a fault is often only inferred from the field relations of the rocks, and therefore its position can only be mapped approximately. A fault may be shown on geological maps as a single line, but may in fact be a series of shears. If the fault occurs in brittle rocks it may result in broken zones, while in clays very little disruption may be apparent. The bearing strength of fault-zone material over the width of the fault should be determined, and if necessary, variations made to foundation specifications as differential compaction may occur. Although Tasmania is seismically quiet, there is always risk involved when building on major fault zones.

As the enlargement of maps showing approximately determined boundaries may increase the inherent errors of mapping and promote unjustified confidence, the fault positions shown on the accompanying engineering geological maps may only be approximate. Only major faults are shown. The position of these faults has been transferred from the appropriate 1:50 000 Geological Atlas map. These latter maps should be referred to for more complete fault information.

PREVIOUS REPORTS

The Tasmania Department of Mines Geological Atlas Series maps and Explanatory Reports for Hobart (Leaman, 1972, 1976), Sorell (Gulline, 1983, 1984) and Kingborough (Farmer, 1981, 1985) provide the base geological information for the engineering geological maps. Leaman (1972) produced a series of engineering geological maps covering most of the Hobart Quadrangle. Much of the information contained on these maps has been incorporated into this publication and accompanying maps, particularly technical data regarding bedrock conditions and rippability. This publication and the accompanying maps seek to revise and expand Leaman’s work.

Resource maps of soils have been produced by the CSIRO (Dimmock, 1957; Loveday, 1955) and more recently by the Department of Primary Industry (Davies, 1988). The latter publication provides valuable information relating soil depth to topographic position.

Underground Water Supply Papers 3 (Nye, 1924) and 7 (Leaman, 1971) report on the groundwater resources of the Richmond–Bridgewater–Sandford District, and the Coal River Basin respectively. They provide information relating geological units to groundwater bore yield and quality.

The recently published Geological Survey Bulletin *Landslides and Land Use Planning* by A. L. Telfer (Telfer, 1988) provides general information and advice for Local Government personnel concerning unstable and potentially unstable land.

The published Survey Papers, Technical Reports and Unpublished Reports of the Division of Mines and Mineral Resources, together with Department of Primary Industry and Municipal technical reports, record significant data about specific sites and previous investigations. Relevant information points are marked on the accompanying maps for future reference.

Other information was obtained from four Division of Mines and Mineral Resources databases: *Boris* — water bore register; *Conmat* — construction materials register; *Cars* — engineering correspondence register; and *Dirtwork* — laboratory analysis register.

ACKNOWLEDGEMENTS

This draft document has been produced from an original submission by P. J. Hofto. Appendices 4, 5 and 6 were prepared by B. D. Weldon from Division of Mines and Mineral Resources databases.

D. J. Sloane has edited and made contributions to this document.

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MAP DESCRIPTION AND DEFINITION

SOIL

To most people, soil is the uppermost layer of the ground, in which plants grow. To the engineer soil includes all unconsolidated material down to bedrock — material which can be dug with a pick. There may be a gradual transition between residual soil and the underlying bedrock. The boundary between a very stiff soil and a very weak rock is somewhat arbitrarily equated with an unconfined compressive strength of about 700 kPa.

The engineer is therefore interested in soil properties which affect:

(i) the support that the soil provides for any building (bearing capacity);

(ii) the stability and erodibility of slopes, both natural slopes or those in cuttings;

(iii) the lateral and vertical pressure that the soil exerts against any structure;

(iv) the ease of excavation of the soil.

WORKABILITY/RIPPABILITY

A chart of workability/rippability is presented in Appendix 1 and on the accompanying maps. This chart, modified after Leaman (1971*b*), indicates the rippability and related seismic velocity of rock units when fresh and dry. Wet and weathered rock or soil behave in varying ways, proportionate to the moisture content, joint frequency and extent of weathering. This chart should therefore be used as a guide, tempered by the knowledge that local moisture content, degree of fracturing, and weathering conditions will control the exact values.

CONSTRUCTION MATERIALS

The Division of Mines and Mineral Resources maintains a database, *Conmat*, which lists registered currently operating and abandoned quarries and pits. This information is summarised in Appendix 5 and cross referenced to the maps. *Conmat* provides data on the type of quarry, reserves, ease of excavation, material use, and land tenure.

HAZARDS

Landslides

Landslides are not generally a major problem in the Greater Hobart area. However some landslides, such as those at Hone Road Rosetta, Casuarina Crescent Berriedale, and Channel Highway Taroona, have caused damage or threatened property. Known landslides are indicated on the maps, and many of these are recorded in Mines Division technical and unpublished reports. Further landslides may occur with changing land use, and this list should in no way be considered complete. Both currently active and ancient or fossil landslides are indicated where they have been identified. A depth to bedrock overprint indicates those soils with thicknesses of less than one metre. Thick accumulations of potentially unstable soil are usually either not in dangerous topographic situations, or are remote from building zones.

The recently published Geological Survey Bulletin 63 *Landslides and Land Use Planning* by A. L. Telfer provides general information and advice on potentially unstable land for local government personnel. Although landslides are not a major problem in the Greater Hobart area, they do exist, have threatened, damaged, and destroyed man-made structures, and disfigured and significantly reduced the value of many natural landforms.

Telfer (1988) suggests that slope failures occur under two categories of unique sets of conditions, namely, historic causes and trigger mechanisms. The correct diagnosis of these conditions is essential in formulating remedial and preventative measures.

Telfer (1988) considers that historic causes (Table 1) are pre-existing geological, climatic and slope conditions, conducive to the formation of landslides or areas of potential instability. Trigger mechanisms (Table 2) are factors which can transform an area of potential instability into a landslide in a comparatively short space of time.

These conditions are interrelated and infinitely variable in proportion. Their identification is essential to prevent development of potential landslide areas, and to assist in the rehabilitation of existing ones.

Any area that is sloping and underlain by thick accumulations of clay may be subject to landslides. Fortunately, in southern Tasmania, clay soils tend to be relatively thin, resulting in a lower landslide risk, and allowing most structures to be founded on competent bedrock. However some thick accumulations of clay soil are present, and where these lie on slopes, usually exceeding approximately 15°, then there is risk of landslide. It must be noted that landslides may still occur on slopes of much less than 15° if appropriate historic causes and trigger mechanisms exist (Plate 10).

These conditions are more common in areas underlain by Jurassic dolerite derived colluvium or slope deposits than other geological rock types in the Greater Hobart area. Elsewhere in the State, landslides occur in Tertiary sediments, weathered basalt, and deeply-weathered Permian mudstone and Triassic sediments.

Erosion

Areas of tunnel and gully erosion are indicated on the accompanying maps. The problem of these eroded and degraded areas should be addressed and the areas rehabilitated.

Tunnel and subsequent gully erosion are often prominent on flats and lower slopes. These forms of erosion are often a direct consequence of increased surface and subsurface water flow due to the removal of vegetation. Water infiltrates into the surface sandy A horizon and is deflected downslope at the top of the B horizon because of the marked contrast in permeability from sand to clayey sand or clay. The clay is often dispersive and is therefore removed in colloidal solution, forming tunnels. Collapsed sections of tunnel erosion may eventually join up, forming a continuous gully section. Gully erosion may also result from the direct erosion of streams or water channels caused

Table 1
HISTORIC CAUSES OF LANDSLIDES

Historic causes	Description
Geology	*Minerals present.* Soft platy minerals will shear and slide easily while hard angular minerals will not.
	Defects in layers of material. Discontinuities such as faults, joints, desiccation cracks and slickensides usually reduce the shear strength of the mass.
	Alternation of layers of different strengths. Massive, competent layers will tend to slide on underlying soft or plastic layers.
	Alternation of layers of different permeabilities. Impermeable layers may be uplifted by pore water pressure in underlying permeable layers.
	Orientation of layers. Layers inclined toward the slope are susceptible to failure along the bedding plane.
Topography and climate	Landforms formed in previous climates may not be stable in the present.

Table 2
TRIGGER MECHANISMS OF LANDSLIDES

Mechanism	Description of destabilising influence
Changes in water content	*Increase:* water penetrating shrinkage cracks and joints produces hydrostatic pressure and uplift. Moisture content increases of clay change the soil's consistency usually reducing its shear strength.
	Decrease: desiccation of clay in drought conditions breaks up soil and facilitates the ingress of water.
	Rapid drawdown: Abrupt lowering of reservoir levels causes an equally rapid decrease in the confining pressure on the reservoir flank and dam materials. The resulting excess pore pressures may precipitate failure.
Groundwater effects	Confined groundwater acts to uplift overlying impervious beds, increasing the level of shear stress closer to the failure threshold.
	Soil below the water table weighs less (because of buoyancy effects), so the shear stress necessary to initiate failure is reduced.
	Soluble cements can be washed from the soils, decreasing their strength.
	Moving water may wash sands or silts from the soil.
Weathering	Mechanical and chemical weathering destroys molecular bonds, usually decreasing shear strength.
Deforestation	Destruction of strength imparted by tree roots.
	Water levels will rise because trees are no longer adsorbing and transpiring water.
Change of slope gradient	Erosion of toe of slope by river or coastal processes.
	Excavation of toe of slope by man (*e.g.* road cutting).
	Previous slope movements.
	Tectonic forces resulting in subsidence or uplift.
Increased load	Significant loading will increase the unit mass of the soil. This will increase the shear stress and may increase pore pressure. The risk of failure increases with the loading rate. Increased loads may be applied by:
	natural surcharge of water, vegetation or scree;
	excess load by embankments, fills and waste dumps;
	excess water from leaking reservoirs, pipelines, sewers, etc.
Shocks and vibrations	Earthquakes, large explosions and machinery vibration produce oscillations of different frequencies in earth materials, and may disturb the equilibrium of the slope.

by increased water flow. These eroded gullies can exceed five metres in depth, seven metres in width, and run for tens of metres. A large gully at Scotts Road, Risdon Vale has been used as a dumping area for car bodies and contains in excess of twenty wrecks. Once tunnels and gullies have been formed, often after a single intense rain period, they are very difficult and expensive to control.

Vegetation provides protection against erosion. It increases the shear strength of the soil mantle by root binding, decreases surface and subsurface water runoff by increased evapotranspiration from the canopy, protects soil from the full impact of raindrops, and utilises a portion of the moisture to sustain plant life. Erosion prevention practices include contour farming, strip cropping, and terracing in agriculture, and the correct planning, design, and construction of roads, amenities, and their associated drainage. These practices disrupt surface water flow, reduce flow velocity, and disperse output loci.

SEPTIC TANK SUITABILITY

The present discussion, and the relevant discussions concerning the geological units, attempts only to outline the general suitability of land in the Greater Hobart area with respect to septic tank effluent disposal. Specific details concerning septic tank operations and the techniques utilised when confronted with problem sites may be obtained from *Septic Tank Installation in Tasmania* (Patterson, 1982) and from local Health Surveyors.

Site constraints affecting septic tank suitability include:

(a) soil permeability; determined by porosity, grain size, aggregation, clay type and content, and soil structure. Specially designed percolation tests should be used by the Health Surveyor to analyse individual sites.

(b) depth to bedrock; adequate depth of suitable soil is necessary to absorb effluent.

(c) depth to water table; Shallow water tables may inhibit absorption, and contaminating groundwater reserves is wasteful and potentially dangerous.

(d) slope; the degree and type of slope may indicate drainage and construction problems. Concave slopes cause surface runoff to converge, while convex slopes disperse the runoff.

(e) area of effective disposal site; sites that do not fall into suitable limits for the above criteria may need to be “extended” to provide an adequate area of absorptive soil.

GROUNDWATER

According to Leaman (1971*a*), the vacant spaces which groundwater may occupy within rocks determine the hydrological characteristics or properties of that rock. The more spaces there are, the greater will be the storage capacity of the rock; the better the interconnection, the higher the permeability.

Hydrological properties of a particular rock unit may be divided into primary and secondary properties. Primary hydrological properties are those which formed at the same time as the rock. These properties include the porosity of the rock and the presence of bedding planes. Secondary hydrological properties develop at some stage after the formation of the rock and are usually related to fracturing. Secondary properties may develop in two stages; the formation of openings by physical or geological processes (joints, faults, intrusions of igneous rocks) and the modification of these openings by the action of circulating water and weathering. The suitability of a particular site for an extractable groundwater resource depends on a favourable combination of the above processes and conditions. Hydrological properties therefore control the occurrence, storage and movement of groundwater in most rocks, and are developed as a result of the action of complex geological, chemical, organic and climatic conditions.

Groundwater information for the Greater Hobart area is contained in the Division of Mines and Mineral Resources database *Boris*, which contains information regarding depth to water table, quality, yield rates, and depth of bores, and is available to the public. The position of these water bores is marked on the accompanying maps and bore details are summarised in Appendix 4. Known seepages and springs are also indicated. These are concentrated at unit boundaries and discontinuities, and generally yield less than 0.03–0.06 L/sec of mostly poor-quality water. Such seepages and springs may initiate landslides or cause undermining of structures. Specific information regarding chemical analysis of groundwater should be obtained from the relevant underground water supply paper. A brief summary of the groundwater characteristics of the individual geological units common in the Greater Hobart area is included within this text.

Any site investigations which provide geotechnical information or refer to specific reports or papers are marked on the accompanying maps. This information is available from the Division of Mines and Mineral Resources, and is presented in abbreviated form in Appendix 6.

PERMIAN SEDIMENTS

GEOLOGY

The oldest exposed rocks in the Hobart area are of Permian age (approximately 250 million years) and consist of a fine sandstone, coarse siltstone and fossiliferous mudstone sequence, with occasional thin conglomerate and limestone beds. The total thickness of the exposed Permian rocks is approximately 600 m, and they generally dip slightly to the west (5–10°). Locally, east of Mt Faulkner and Mt Wellington, blocks of Permian sediments dip slightly to the east with some dips exceeding 20°. Upon excavation, minor slippage of whole blocks is possible, especially where dips exceed 10°–20° and are steeper than the natural slope angle.

Weathering of Permian rocks is usually uniform and shallow (Plate 1). This enables foundations to be excavated to fresh rock or rock of acceptable stability. Fretting of surface outcrops is common, and locally units may weather deeply to clay (CH) or gravelly clay (GC).

Limestone units tend to weather deeply and quickly in zones of high joint intensity, producing clay bands. Occasionally this may precipitate block failure, particularly when the moisture within the clay-filled joints is confined, resulting in high pore pressures.

Joint frequency in Permian sediments is usually 3–4 per metre but this may increase to 12–16 per metre in the vicinity of faults or where thermally affected by the intrusion of igneous rocks. These joints usually remain open although, as mentioned, joints in limestone units tend to be infilled with clay. Permian sediments, and especially limestone units, are hard and brittle but because they are well jointed they are usually easily worked using explosives and mechanical hammers, followed by ripping.

The accompanying table of workability/rippability (modified after Leaman, 1971*b*) relates the difficulty of excavation with the seismic velocity of fresh rock (Appendix 1). Shallow seismic refraction surveys are therefore often used as an investigation tool when costing excavation proposals.

SOILS

Exposed ridge crests and upper slopes typically contain shallow (<0.40 m) grey-brown, gravelly, silty sand (SM) developed on bedrock. Surface outcrop is common. Flat topped crests and upper slopes may have shallow (<0.60 m) gravelly, duplex soils consisting of grey-brown, organic silty sand (SC) over yellow-brown, medium plasticity clay/clayey sand (SC) on bedrock. Duplex soils have a marked contrast in clay content between surface and subsurface horizons, the lower horizons having the higher clay content. These soils may be locally deep (1.50 m) on steep, exposed slopes. Mid and lower slopes commonly contain similar duplex soil but they are usually deeper (1.20–1.40 m).

Thick (>2.0 m) silty, sandy gravels (GM) often exist on steep south and south-east facing slopes. These slope deposits have previously been loosely termed ‘talus’ (Plate 2). Lower slopes and flat areas often contain a deep (>1.10 m) duplex soil consisting of light-grey, organic, silty sand (SM–SC) sometimes with minor clay content over a grey, medium plasticity clay/sandy clay (CH) that may have a light-brown mottle at depth. Soils may be gradational rather than duplex on drainage flats. A summary of laboratory-derived soil characteristics is presented within the spread sheet on the accompanying maps, and in Appendix 2.

RESOURCES AND LAND USE

The majority of land underlain by Permian sediments is undeveloped natural bushland, especially west of the River Derwent. Hills and upper slopes are generally used for water catchment, registered Recreation Areas, and minor agricultural practices. Many quarries, mostly disused, exist in these areas. They are marked on the accompanying maps, and referred to in more detail in the Construction Materials Register *(Conmat)* which is summarised in Appendix 5.

The material has been quarried for a variety of uses. The limestone is not pure enough for commercial cement manufacture, but the mudstone and siltstone are suitable for road base material and bind well when crushed and compacted at optimum moisture content. Some minor brickwork clay and small quantities of building stone have been extracted, although no commercial operations exist today.

Middle slopes are also used for minor grazing and cropping, and are starting to be developed as fringe subdivisions. Lower slopes and flats have been extensively cleared for subdivision and agricultural purposes. These include grazing, orchards and some cropping, although such land is considered too poor for very intensive cropping.

HAZARDS

Soils on Permian sediments are particularly susceptible to erosion. Areas cleared of natural vegetation, or with a sparse understorey, provide little resistance to sheet, tunnel and gully erosion. Sheet erosion generally occurs on hilltops or upperslopes, underlain by thin silty sands (SM) and gravels (GM) with a minor clay component. These thin, nutrient-depleted soils support only sparse open woodland with very little understorey to bind surface soils.Tunnel and subsequent gully erosion are often prominent on flats and lower slopes. These forms of erosion are often a direct consequence of increased surface and subsurface water flow due to the removal of vegetation.

Laboratory tested samples of Permian soils vary in dispersivity, some being strongly dispersive, others less so. Gully erosion may also result from the direct erosion of streams or water channels caused by increased water flow. These eroded gullies can exceed five metres in depth, seven metres in width, and run for tens of metres. A large gully at Scotts Road, Risdon Vale has been used as a dumping area for car bodies and contains in excess of twenty wrecks. Once tunnels and gullies have been formed, often after a single intense rain period, they are very difficult and expensive to control.

Plate 1. Shallow weathering of Permian mudstone — Sky Farm Road, Glenorchy

Plate 2. Sandy gravel slope deposits on Permian bedrock — Turnip Fields, Fern Tree

Further detailed information regarding remedial work and rehabilitation may be obtained from the Department of Primary Industry.

Shallow landslides often occur in weathered Permian material on slopes greater than 18°. It is therefore generally accepted that these areas are not suitable for normal subdivision, although individual houses may be built if sited and constructed correctly. Active slides are uncommon in naturally vegetated areas, although bent trees and small scallops in the ground surface indicate that soil creep is active on steep, vegetated slopes. Landslides on Permian-derived material occur in several locations such as Turnip Fields and Fern Tree but are most prevalent around Glenlusk. "They range from shallow soil slips, a few metres wide, to slips 50 m wide and 4 m deep. Slips have been reported to occur suddenly and typically form a spoon-shaped depression with a bulging toe accompanied by a short mud flow." (Knights, 1976).

Where recent landslides occur they can be attributed to oversteepening by excavation, clearing vegetation from the slope, or the redirection of drainage paths. On the northern slopes of Goat Hills scarps of ancient, deeply seated, rotational landslides cover several hundred square metres. The age of these landslides is unknown, but they show no signs of recent instability. They are characterised by deep weathering, and the material may be subject to small-scale movements on steep, exposed slopes.

Similar deposits often occur at the base of steep south and south-east facing slopes. This talus or slump deposit material may be several metres thick and contain angular fragments of bedrock in a sand/silt/clay matrix. These soils will all settle slightly under load, and seasonal expansion/shrinkage may also cause problems if the moisture content is changed during development.

The excavation of material in areas of steeply dipping Permian bedrock may require caution. Instability may occur when the bedrock dip exceeds 10–20°, is steeper than the ground slope angle, and dips in the same direction as the slope. Excavation in these areas may cause whole blocks of bedrock to slip out along bedding planes. Therefore, on the side of an excavation where the dip of the rock is into the excavation, the slope of the face will need to be less and benched more often than on the opposing face. On the opposing face the rocks will dip into the face of the excavation and will therefore be naturally more stable. In jointed rocks allowance must also be made for the attitude and dip of joints, as these discontinuities will determine the size of blocks which may drop from the face.

Seepages and springs flowing from geological boundaries or discontinuities (faults, joints and bedding planes) may also exacerbate the dip/slope problem. Unloading of soil and the upper rock layers may allow erosion of joint fill material, increasing the flow of water through the discontinuities. This may necessitate the drainage of excavations both during and after construction, particularly if the construction is for a permanent structure such as a house or roadway.

SEPTIC TANK SUITABILITY

Soils developed on Permian sediments vary in both type and thickness, and therefore also in suitability for septic tanks. They are, however, generally suitable. Caution is necessary in areas of steep slope, as soils may be shallow, seepages common, and erosion (sheet, tunnel and gully) may occur if effluent outflow is concentrated in a small area. Erosion may be particularly prevalent if the soil contains dispersive clay minerals, and slopes are cleared of natural vegetation. Locally thick accumulations of clay within the soil profile may significantly reduce permeability, and therefore the ability to absorb necessary quantities of effluent.

GROUNDWATER

Permian sediments within the Greater Hobart area are generally excellent aquifers. The water is dominantly contained in fractures or bedding planes, although variations in lithology do affect the porosity at specific locations. Yields are normally in the range from 0.25–0.65 L/sec (200–500 gallons/hour) and bore depths of more than 40 m are rarely required. Leaman (1971*a*) suggested that bores exceeding 30 m depth yield little extra groundwater because fractures tend to be sealed with pyrite or closed tight. More recently, deeper bores yielding good quantities of groundwater have cast doubt on this suggestion. The quality of the water is usually fair to excellent, and although mostly unsuitable for direct irrigation, is usually more than adequate for stock and other general purposes.

TRIASSIC SEDIMENTS

GEOLOGY

Triassic sediments, approximately 200 million years old, conformably overlie the Permian units in the Greater Hobart area, and may be divided into two associations. The older association consists of a sequence of well-sorted quartz sandstone with interbedded mudstone and shale. These units contain varying proportions of mica, feldspar and graphite, and have a thickness in excess of 400 metres. The second, or younger association, consists of at least 150 m of white feldspathic sandstone and micaceous mudstone, often containing rock fragments and sometimes coal. The Triassic units generally dip slightly to the west (5–10°), although locally fault-bound blocks have dips in excess of 20°.

Triassic sediments tend to weather irregularly as a result of variations in the nature of rock layers. The sandstone units exhibit a thick and gradational weathering profile, largely of clayey sand (SC). The mudstones are particularly susceptible to weathering, often forming thick clay horizons. Weathering may be variable in thickness, with clay extending to several metres in depth (Plate 3). This factor should be considered when designing and excavating foundations. Even loading should be ensured, or foundations taken down to hard rock, to maintain stability.

Joint frequency in the Triassic sediments is commonly less than 1 to 2 per metre, but increasing in areas of intense faulting. The Triassic sediments are not generally brittle, but in areas of intense fracturing they tend to weather deeply very quickly. This often produces clay-filled joints, and the resulting confined water may need to be drained prior to loading the unit. Differential compaction may also occur over these weathered, fractured zones. It is therefore important to determine their extent, and to design support accordingly. The sandstone units may be difficult to excavate in areas of low joint frequency, requiring careful use of explosives and mechanical hammers. Mudstones tend to be friable and easily excavated.

SOILS

Exposed ridge crests typically contain shallow (<0.30 m), often stony, black to dark yellow-brown organic sand and silty sand (SM) on bedrock. Bedrock often crops out and may be present as small cliffs, sometimes weathering to leave shallow caves. Steep upper slopes have similar soils to the crest, although they may be locally deeper and occasionally contain brown, medium plasticity clay (CL–CH). Mid and lower slopes may host one of two soils, depending on the nature of the underlying sediments.

Highly siliceous and permeable Triassic sediments tend to develop deep (>1.40 m), dark-grey uniform sands (SP) over leached yellow-brown sands (SP) (Plate 4). These soils have previously been described as podsols on mudstone by Dimmock (1957) and Loveday (1955).

Sandstone containing feldspar and/or other clay forming minerals forms podsolic soils, commonly a deep (>1.40 m) duplex soil with a dark-grey, organic silty sand (SM) over a brown to grey medium-plasticity sandy clay (SC). The surface layer of fine sand is common to both soils, and is similar in nature to Quaternary windblown sand, making accurate boundary identification difficult. Both sand types have been extensively mined.

Thick (>2.0 m) accumulations of clayey sand (SC) and clay (CH) often exist at the base of steep slopes. These footslope deposits develop because of the uneven nature of weathering and increase in moisture content where clays are present, and the downslope movement of soil.

Flat areas have a deep (>1.40 m) gradational soil dominated by medium plasticity clayey sand (SC). This may be overlain by organic sand and clay. Black, high-plasticity clay (CH) may overlie Triassic sediments downslope of dolerite intrusions. These dolerite-derived soils have crept downslope, mixing with the Triassic clay, making the dolerite/sandstone boundary difficult to locate. A summary of laboratory-determined soil characteristics is presented on the accompanying maps and in Appendix 2.

RESOURCES AND LAND USE

Land underlain by Triassic sediments is used for a variety of activities. Ridge crests and steep slopes are often left under natural vegetation, and used for recreation and water catchment purposes. Subdivisions are encroaching into these areas, but are more commonly situated on flatter ground. Middle and lower slopes are used for grazing and minor cropping, although increasing numbers of large acreage subdivisions are decreasing agricultural activities. Sandy soils derived from Triassic rocks are generally nutrient deficient, because of leaching, and extensive use of fertilisers is necessary when cultivating.

Although only small-scale quarries are still in operation, extensive areas have been developed for sand mining, especially in the Kingborough and Clarence areas. Several quarries for sandstone building stone were once worked but have since been abandoned. Crushed rock and clay may be used for brickmaking and road foundations. Further information is available from the Construction Materials Register, a summary of which appears in Appendix 5.

HAZARDS

Soils developed on Triassic sediments are not particularly susceptible to erosion unless areas have been cleared of natural vegetation, or have a sparse understorey, thus providing little protection from sheet, tunnel and gully erosion. Sheet erosion is not common because of the deep sandy (SP) soils. Where outcrop does occur, as small cliffs and exposed blocks, the dark, sandy soil is usually free-draining and unlikely to initiate the surface flow necessary for sheet erosion. Tunnel and subsequent gully erosion does exist on lower slopes and flat areas underlain by Triassic sediments but it is not prevalent. This erosion is the direct consequence of increased water flow due to devegetation in areas where surface sands are underlain by clay. Laboratory tested samples of Triassic soils vary in dispersivity, some samples being classified as highly dispersive. Tunnel and gully erosion within soils derived from Triassic rocks tends to remain small scale compared with Permian sediments. At Battersby Drive, Glenorchy, tunnels up to 1.5 m in depth and apparently extending

Plate 3. (left). Thick sandy clay (SC) soil on Triassic sandstone, St Virgils College, Austins Ferry

Plate 4. (below). Podsol developed on Triassic sandstone — Blackmans Bay

approximately 50 m downslope, can be seen (Plate 5). Exposed banks and cuttings, as seen at Wellesley Park, Cascades, erode extremely rapidly and deeply, as no vegetation cover exists (Plate 6).

Vegetation provides protection against erosion. Detailed information regarding prevention and rehabilitation of eroded areas may be obtained from the Department of Primary Industry.

Minor seepages and springs originate from the Triassic sediments in many areas. Only a few of the springs are indicated, but they occur along discontinuities such as joints, faults and bedding planes. Springs are often noticed during excavation of house foundations or road construction. Excavations may need to be drained both during and after construction. Most seepages are very small, delivering less than 100 L/hour of water (Leaman, 1976). Water quality is usually poor.

Areas where soils derived from Triassic rocks contain thick clay profiles should be further investigated to determine the seasonal shrink/swell characteristics of the materials. Some clay minerals readily absorb water into their structure, thereby expanding, and sometimes causing structural damage should structures not contain adequate reinforcement. The black clay soil developed on Triassic sediments downslope from Jurassic dolerite contains montmorillonite, a mineral particularly susceptible to expansion and contraction due to moisture content variation. Thick clay may also be prone to landslide if present on steep slopes. At Tara Street, South Hobart, a landslide approximately 40 m 60 m has developed under these conditions. Soil characteristics are further discussed in the section on soils derived from Jurassic dolerite.

SEPTIC TANK SUITABILITY

Soils developed on Triassic sediments are generally suitable for septic tank installation. The thick podsols are particularly suitable, the upper sand horizons being very permeable. Caution is necessary in areas where Triassic sediments crop out on exposed ridge crests and steep upper slopes. Seepages are common in these areas, creating local perched water tables and inhibiting absorption of effluent. Many Triassic soils contain dispersive clay minerals. Effluent outlets should therefore be suitably positioned along contours to prevent excessive moisture outflow at a single point, as this may initiate erosion.

Podsolic soils, consisting of sandy surface A horizons over sandy clay B horizons, often form on feldspathic sandstones of Triassic age. Soils of this type should be properly investigated to determine if they are capable of absorbing suitable quantities of effluent. Black, high plasticity clay soils often found near dolerite contacts are not suitable for septic tank effluent disposal, because of poor absorptivity and high shrink/swell characteristics.

GROUNDWATER

Within the Triassic sediments of the Greater Hobart area, water is dominantly contained along bedding planes or compositional boundaries, although secondary fracturing is locally very important. Rock between bedding discontinuities or fractures may be quite dry, due to cementation. With quartz sandstone, the cementation is caused by the redeposition of silica from groundwater solution passing through the rock. The finer grained mudstones do not generally yield any contained water because of their low permeability.

The quartz sandstone sequence is a good groundwater source. Yields in the order of 0.25–0.50 L/sec (200–400 gal/h) are common, with bore depths usually less than 40 metres. The feldspathic sandstone sequences have similar characteristics to the quartz sandstone sequences, with one major difference; they are more susceptible to weathering and are therefore less reliable aquifers. Where water has passed through such rocks rich in feldspar and rock fragments there may be almost complete decomposition to clay. This decomposition may exist to considerable depth and is dominant in lower lying areas. Yields are similar to the quartz sandstone sequence where clay has not restricted water flow. Water quality is usually only fair, and care must be exercised when determining the use, other than for stock water.

Plate 5. Tunnel erosion in soils on Triassic sediments — Battersby Drive, Glenorchy

Plate 6. Erosion of exposed banks and cuttings in soils on Triassic sediments — Wellesley Park, South Hobart

JURASSIC DOLERITE

GEOLOGY

Jurassic dolerite (approximately 170 million years in age) intrudes Permian and Triassic sediments, and is the most extensive rock type found in the Greater Hobart area. Locally referred to as ironstone or bluestone, dolerite was intruded into pre-existing rocks (Permian and Triassic sediments) in a molten state. It is present as dykes, sheets, and plugs which were emplaced in several pulses of intrusion, generally in the form of large, undulating interconnecting sheets. The dolerite was formed from a molten magma which cooled slowly, allowing constituent crystals to grow and interlock, giving the rock its great strength. Dolerite is resistant to erosion and therefore erodes more slowly than neighbouring units. This rock type dominates the landscape, producing features such as Mt Wellington and the Wellington Range. The structure of dolerite in the Greater Hobart area is discussed in detail by Leaman (1970). In the Greater Hobart area dolerite has a widespread occurrence over a wide range of altitudes (0–1200+ m), and is therefore subject to an extensive range of weathering and soil-forming environments.

Constituent minerals of dolerite are susceptible to chemical weathering by water containing dissolved oxygen and carbon dioxide, changing the dolerite from a fresh blue-grey rock to orange-brown clay. This weathering begins on exposed surfaces and in fractures, and is most evident in fine-grained or acidic rock. Weathering is dependent on joint frequency and direction, causing a variation in rock strength both vertically and horizontally. Continued weathering may lead to spheroidal or “onion skin weathering”. This process, called exfoliation, leaves hard bedrock kernels enclosed within skins of crumbly weathered rock and clay to depths exceeding two metres. On steep slopes freeze-thaw action and joint relaxation from stress release may open fractures and cause block falls, creating scree and talus.

Joint frequency within the Jurassic dolerite is extremely variable. It is determined by grain size (finer grained dolerite close to chilled margins may have 15–20 joints per metre) and position with respect to faults (faulting increases the fracturing and joint intensity of the rock). Where construction takes place on these margins it is possible that differential compaction and subsequent settlement may occur. Fractures tend to infill with chloritic clay in fresh rock, and with porous iron oxide when weathered. Foundations should be excavated to fresh rock or to material of sufficient bearing strength, usually occurring within two metres of the surface. Fresh dolerite bedrock is most effectively excavated using explosives. Where this is not feasible, mechanical hammering may be used but can prove to be expensive. The seismic velocity of the bedrock gives a reasonably accurate and effective estimate of cost of rippability (Appendix 1 and Map Sheet Keys).

SOILS

Three soil types overlying Jurassic dolerite have been identified on the accompanying maps. The most extensive type is a brown, high plasticity clay (CH) (Plate 7). Crests and upper slopes contain a shallow (0.50 m), often stony, duplex soil with organic sand containing clay (SC) over a brown, high plasticity clay (CH). Dolerite fragments occur throughout the profile and the brown, high plasticity clay usually rests directly upon relatively fresh bedrock. Locally within the Wellington Range, above approximately 900 m, well-drained ridge crests and upper slopes may have deep (0.90 m), sandy organic clay (SC) over yellow-brown, high plasticity clay (CH).

Mid slopes contain a shallow (0.50 m), stony, duplex soil composed of organic sand containing clay of medium plasticity (SC), over yellow-brown, high plasticity clay (CH). Outcrops are common at the surface, and locally soils may exceed 1.50 m in depth.

Exposed lower slopes usually have clayey sand (SC) over high plasticity clay (CH) to 0.80 metres. Locally, especially on protected slopes and in gullies, deeper (>2.0 m) *in situ* and clay soils derived from upslope may cause stability problems. These soils often contain large dolerite boulders, and it may therefore be difficult to determine the depth to competent bedrock. Flatter areas and drainage flats may have deep (>1.40 m) gradational soils with organic sand containing clay (SC) overlying brown, high plasticity clay (CH).

The second soil type which has developed on dolerite bedrock is a light-brown, sandy clay (SC) (Plate 8). This soils occurs on hilltops and upper slopes as patches within the brown, high plasticity clay (CH). They are shallow (<0.60 m) with brown, organic clayey sand (SC) overlying light-brown, medium plasticity sandy clay (CH). Profiles are often intersected by surface outcrop and may contain large dolerite boulders.

The third soil type mapped on dolerite bedrock is the black soil, which is almost entirely restricted to the mid and lower portions of east and south-facing slopes. The A or surface horizon consists of black, high-plasticity organic clay containing montmorillonite and kaolinite. A gradational boundary with a yellowish-brown, stony clay occurs at approximately 0.50 metres. Bedrock is usually encountered at less than 0.70 m depth (Plate 9). Free calcium carbonate usually occurs in joints and fractures in the bedrock, sometimes in sufficient amounts to form a marl in this horizon of weathered rock below the clay. The presence of free carbonate indicates a dry environment, and therefore minimal leaching, leaving the black soils nutrient rich.

It must be noted that many soils on dolerite, which have been mapped as brown, high plasticity clay (CH) may, under further investigation, be redefined as sandy clay (SC) and black clay (CH). This may require further laboratory analysis.

RESOURCES AND LAND USE

Land underlain by Jurassic dolerite has a variety of uses. Many crests and steep slopes are nearly inaccessible, support natural vegetation, and are used as nature conservation, water catchment, and recreation areas. Although development is expensive, residential subdivision of this steep land is becoming popular, as people move away from inner suburban areas and into areas with panoramic views immediately surrounding the

Plate 7. (left). Brown clay (CH) soil on dolerite bedrock — Allambee Crescent, Glebe

Plate 8. (below). Brown, sandy clay (SC) soil on dolerite bedrock — Caroda Court, Howrah

port of Hobart. Middle and lower slopes are used for grazing, minor cropping, and fringe subdivision. Soils are generally too poor for intensive cropping although, as previously mentioned, the black clay is nutrient rich and can sustain crops if water is available. Although not extensive, flat areas underlain by dolerite are predominantly used for agricultural purposes but are prone to waterlogging.

Jurassic dolerite is extensively quarried; crushed, unweathered rock is an excellent concrete aggregate, fill, and road-surfacing material. Weathered material may be used in road foundations. Some building stone has been extracted, but the fresh rock is extremely hard and difficult to shape.

Further information regarding construction materials is available in summarised form in Appendix 5.

HAZARDS

Landslides on Jurassic dolerite bedrock occur at Droughty Point, Taroona, Dynnyrne, and Glenorchy.

A landslide on the south-eastern slopes of Goat Hills at Glenorchy (Plate 10) is shallow and small in area (10 m 30 m). It has apparently been caused by material being removed from the base of the slope by excess water flow down an adjacent stream, caused by water being released from town water supply pipes.

North of Ten Mile Hill, fragmented dolerite material formed during ancient landslide activity underlies units mapped as brown clay on Jurassic dolerite. These fragmented materials are several metres thick and their stability should be further investigated prior to development, even though they appear to be presently stable.

Dolerite-derived soils contain the clay mineral kaolinite. Kaolinite forms from the decomposition of aluminosilicates, especially feldspar, and when wet has an extremely low strength, thereby "flowing" and mobilising the soil and contributing to slope failure.

Soils derived from Jurassic dolerite are sometimes subject to strong seasonal shrinkage and expansion, depending on their moisture content. Each of the three dolerite soil types contain certain clay minerals in varying quantities. These clay minerals determine the behaviour of the soil under certain moisture conditions. Mass movement of soil is often attributed to the montmorillonite content.

Black clay on dolerite bedrock contains very high percentages of montmorillonite, and is therefore particularly prone to seasonal volume changes because of shrink/swell characteristics. The other dolerite-derived soils are also expansive to some extent. The resulting soil movement may be sufficient to destroy poorly reinforced concrete slabs and footings.

Destruction of, or damage to, man-made structures is often caused by differential expansion and contraction of the soil beneath the structure or building. This may be caused by variations in moisture content of the soil. For example, the area beneath the centre of a concrete slab will eventually reach a constant moisture content, whilst the moisture content beneath the outer portions of the slab varies as a result of seasonal effects and introduced conditions, such as garden watering.

Differential expansion and contraction may also occur when a structure is founded on more than one material type. This may occur when a portion of a structure is tied to bedrock whilst another section is underlain by soil. Specific building codes outline the precautions to be taken when constructing in areas underlain by expansive clays. In the Greater Hobart area, most structures can be founded on material of suitable bearing strength, eliminating many of the above problems; in most cases the depth of the most expansive black clay on dolerite is less than one metre.

Dolerite bedrock is usually stable when exposed in cuttings, trenches or tunnels. Soil and soft, weathered material should always be removed from the top of cut faces. Dolerite lacks the stability of bedded rocks because of the variability of jointing frequency and direction. Care must therefore be exercised, as large block failures are common, as seen on the Southern Outlet cutting at Tolmans Hill. Water seepage from freshly exposed and open joints may compound the problem.

SEPTIC TANK SUITABILITY

Soils developed on Jurassic dolerite are generally not suitable for standard septic tank installation. However with suitable modification to the mode of effluent disposal, they may prove viable. The soils have a high clay component and therefore low permeability. Exposed ridge crests and steep slopes often have very shallow soils, and bedrock exposures are common. Black clay (CH) soils developed on Jurassic dolerite have extremely low permeability and are subject to significant volume variation depending on moisture content because of their high shrink/swell characteristics. Such soils are not suitable for normal septic tank installation.

GROUNDWATER

Unweathered dolerite has a porosity of less than 1%. Any contained water is consequently found in fractures. Providing weathering is not extreme or has not produced a gravelly material which retains the original rock texture, then porosity and permeability may be considerably increased. Dolerite in the Greater Hobart area is dominated by vertical or near-vertical joints and is topographically unsuitable for groundwater recovery unless drilled to extreme depths.

Plate 9. (left). Black clay (CH) soil on dolerite bedrock — Nicholas Drive, Lower Sandy Bay

Plate 10. (below). Shallow landslide in dolerite soil — Goat Hills, Glenorchy

TERTIARY BASALT

GEOLOGY

Tertiary basalt occurs sporadically in the Greater Hobart area. Sutherland notes (*in* Leaman, 1976) that the basalt lavas range in composition from saturated to more under-saturated and alkaline rock types. The basalt lavas issued from more than twenty centres, structurally located mainly on, or near, faults and dolerite margins. The volcanoes originally erupted over an irregular landscape, similar to that of the present day.

For the purpose of this study and to simplify nomenclature for engineers and planners, all lavas will be considered as one mapped unit. This is not an unreasonable assumption, considering the minor occurrences of basalt in the Greater Hobart area. Basalt is an extrusive rock, which flowed out onto the pre-existing ground surface in a molten state as a lava, solidifying as it cooled. A variety of volcanic material may be associated with the extrusive process, including tuff, pumice and basalt scoria. These materials have not been mapped separately. Basalt is the fine-grained chemical equivalent of dolerite, having many similarities in engineering and soil-forming properties. The most obvious similarities are the immense strength and hardness of the fresh bedrock, and the resistance of the rock to erosion. Remnant volcanic plugs and lava flows therefore often form dominant landscape features.

The constituent minerals of basalt are susceptible to chemical weathering by water containing dissolved oxygen and carbon dioxide, causing the infilling of fractures and vesicles with iron oxide, and changing the basalt from a fresh blue-grey rock to orange-brown clay. This weathering begins in fractures, and is therefore dependent on joint frequency and direction, which therefore causes great variation in both the vertical and horizontal extent of weathering.

Foundations should be excavated to bedrock of suitable strength, usually found within 1.50 m of the surface. Variation may also be experienced in the rates and type of weathering, depending on the physical and chemical composition of associated extrusive material (tuff, pumice etc.). It is therefore important to investigate the weathering state sufficiently at individual sites in order to ensure adequate foundation stability.

Joint frequency within Tertiary basalt is variable, and is determined by grain size (finer grained basalt close to chilled margins may have 15–20 joints per metre), and position with respect to faults (faulting increases the fracturing and joint intensity of the rock). Where construction takes place on these margins it is possible that differential settlement may occur. Fractures tend to infill with clay in fresh rock, and iron oxide when weathered. Fresh basaltic bedrock is most effectively excavated using explosives. Where this is not feasible mechanical hammering may be used, but can prove to be expensive or ineffective in areas of low fracture intensity. The seismic velocity of the bedrock gives a reasonably accurate effective estimate of the rippability cost (Appendix 1).

SOIL

Exposed stony ridge crests and upper slopes have a brown, shallow (<0.5 m), uniform, high-plasticity organic clay (OH) overlying bedrock. Surface outcrop is common. Occasionally the organic clay may be overlain by dark brown, clayey sand (SC). Lower slopes and flat areas have a deeper (>0.60 m) duplex soil, with a dark brown to black, high plasticity organic clay (CH) overlying a dark, yellow-grey clay (CH) on bedrock. Locally these profiles may exceed 1.50 m in depth. Drainage flats contain a deep (>1.40 m) gradational soil consisting of sandy organic clay (OH) over brown, high plasticity clay (CH). Basalt bedrock is probably the most soil-nutrient rich of all bedrocks in the Greater Hobart area; it is a very capable supplier of plant mineral nutrients. Formed in a similar environment to the black soils on dolerite, minimal leaching has left the soil profile nutrient-rich.

RESOURCES AND LAND USE

Tertiary basalts and the soils derived from them only occur as small isolated bodies in the Greater Hobart area, therefore specific and extensive use of these fertile soils is limited. Much of the basalt areas are used for residential development, the most recent example being the Huntingfield development in the Kingborough Municipality. Rural land is predominantly used for grazing, although some more extensive cropping is undertaken where water supplies are sufficient. When fresh and suitably crushed, Tertiary basalt may be used for road surfacing and general aggregate. An extensive list of construction material locations is available in the Construction Materials Register *Conmat* (Appendix 5).

HAZARDS

Because of the relatively minor occurrence of Tertiary basalt and consequent hazards associated with the unit in the Greater Hobart area, this discussion will be of a general and brief nature. Caution is necessary when confronted with material mapped as Tertiary basalt, because of the considerable variation in nature and therefore weathering. The material around volcanic necks is particularly variable, consisting of a solid basalt core surrounded by more porous flow basalt, with interbedded tuff and breccia. It is therefore necessary to examine foundation conditions carefully and to determine accurately the variation in bedrock composition around volcanic necks, prior to construction.

Soils derived from Tertiary basalt are subject to similar seasonal shrink/swell problems as dolerite-derived soils (refer to the *Hazards* section concerning Jurassic dolerite). The resulting problems associated with differential settlement are also similar to those on dolerite but are magnified by the greater weathering variation displayed by Tertiary basalts. This variation may be extreme, both vertically and horizontally, and should be determined by intense site investigation.

The comments in the *Hazards* section of Jurassic dolerite regarding landslide are also particularly relevant to Tertiary basalt. As with dolerite, any slopes, particularly if steep and underlain by thick accumulations of clay soil, are at risk of landslide, particularly when one or more trigger mechanisms (Table 1 and 2) are active.

SEPTIC TANK SUITABILITY

Septic tank installation in soils derived from Tertiary basalt is not common, due to the localised occurrences of basalt in the Greater Hobart area. The clay soils developed on lower slopes and flat areas generally have a low permeability, while upper slopes and exposed ridge crests have shallow soils. Locally thick, clayey sand soils may be capable of absorbing sufficient effluent, if the disposal system is properly designed.

GROUNDWATER

Because of the minimal occurrence of basalt in the Greater Hobart area, the groundwater potential is unknown. Studies of areas where basalt is more dominant suggest that water is contained in both vesicular openings and vertical joints. However the basalt is not regarded as a significant aquifer in the Hobart area, and investigations of basaltic aquifers nearby suggest that water quality would be poor.

TERTIARY SEDIMENTS

GEOLOGY

Two sub-units of Tertiary sediments have been mapped on the engineering geological maps of the Greater Hobart area.

The most extensive unit consists of probable valley-fill sediments primarily found in the eroded fault troughs of the Derwent and Coal River Valleys. These sediments consist of variably coloured clayey sand, fine sand and agglomerate and, according to Leaman (1976), are present in thicknesses exceeding 100 metres. Locally, at Taroona and Droughty Point, the unit may contain large broken boulders or weathered fragmented blocks of dolerite and Permian sediments. Leaman (1976) suggests that these may be late-stage landslide deposits, the Permian rock fragments being included due to crumbling of the underlying mudstone. A complex history of erosion and deposition is implied by the form, altitude and composition of many Tertiary sediments. Basalt flows interdigitate with the sediments. The clays within the matrix of these sediments are of medium plasticity, and of moderate to high dispersivity. These sediments are present in large basins in the lower reaches of the River Derwent at Moonah and Sandy Bay, and the Coal River at Pittwater and Acton. Smaller isolated deposits occur at Selfs Point, Droughty Point, Lauderdale, Whitewater Creek and Margate.

The smaller, second sub-unit of the Tertiary sediments consists of deposits of silica stone and minor agglomerate. Silica stone or "greybilly" is present at Calverts Lagoon and in several isolated spots near Margate. It consists of white-grey quartz-rich sand and granule-pebble conglomerate cemented into a hard unit by secondary silica. It was formed by the passage of molten basaltic lava over superficial deposits of water-logged sand and gravel, and is characterised by its extreme hardness and glassy appearance.

The Tertiary sediments are usually only slightly weathered but occasionally the erosional effects caused by variations in weathering are significant and are discussed in detail in the following section on Hazards. Some of the clays are highly dispersive and therefore disintegrate when exposed to surface and subsurface water flow. This may lead to tunnel, and eventually gully erosion, as seen at Droughty Point. Tertiary sediments are easily excavated by machinery, although the initial breaking of the harder greybilly unit may require repeated effort.

SOILS

Determining and qualifying the nature and extent of soils on unconsolidated sediments is difficult, as the boundary dividing the two is not always clear. Such is also the case for any of the younger Quaternary sediments. The definition of soil previously stated includes "all unconsolidated material down to bedrock-material which can be dug with a pick". Using this definition strictly, all units of Quaternary age, and some of the Tertiary sediments, may be considered as soil or regolith (an incoherent mantle of rock fragments, soil, blown sand, or alluvium resting on bedrock). The engineer must therefore consider and analyse the properties of the soil or regoliths which affect support, stability, lateral and vertical pressure exerted by the unit structure, and ease of excavation. Generally however, the soils overlying these mapped units consist of shallow (0.50 m) medium plasticity sandy clay (SC) and grey organic sand (SP). In places the underlying sediments may be exposed, with no developed soil profile present.

RESOURCES AND LAND USE

Although not particularly fertile, land underlain by Tertiary sediments is used predominantly for agricultural uses, particularly grazing. Some of the area remains under natural vegetation. Minor quarrying has taken place in areas underlain by Tertiary sediments, operations being confined to minor extractions of sand, gravel, and clay used in brick making.

HAZARDS

Areas underlain by Tertiary sediments are mostly used for improved pasture, and are therefore usually devoid of natural vegetation. This has made the soils susceptible to tunnel and gully erosion in the Greater Hobart area, the worst example being the Droughty Point region. Here Tertiary sediments are present as channel infill deposits, occurring extensively from Cartwright Point around to Tranmere Point. Plates 11 and 12 indicate the extent of the erosion, with channels exceeding seven metres in width and five metres in depth. In their present state and extent they are dangerous to both grazing stock and man, as the extensive tunnel systems, sometimes very difficult to locate, are continually collapsing, forming long gullies. Once the tunnel and gully erosion has extensively developed the process of rehabilitation and regeneration becomes complex, time consuming, and very expensive. However for the land to be developed, the problems must be addressed and solutions found and implemented.

The regional extent of the moderately to highly dispersive soil units is at present unknown. There may be several areas underlain by these soils which have not been located by field mapping. Such areas should be identified prior to development. Extensive shallow drilling programmes and selected geophysical techniques may prove valuable exploration tools at Droughty Point.

Locations have been seen where the planting of trees has inhibited the extension of the tunnel and gully erosion. Extensive planting of vegetation may be an important tool when rehabilitating the eroded areas at Droughty Point. Further detailed information regarding remedial work and rehabilitation may be obtained from the Department of Primary Industry.

Landslides may also occur in Tertiary sediments. A landslide at Taroona occurs partly in Tertiary sediments. The Channel Highway has been displaced at or near the head or crown scarp of the landslide. The slide has also caused damage to several dwellings, walkways, fences and stormwater drains. The poorly consolidated sediments provide little resistance when subjected to mass movement, strongly indicating the need to thoroughly investigate areas underlain by these sediments, especially when they occur on moderate to steep slopes. Regional

Plate 11. Gully erosion in Tertiary sediments — Droughty Point.

Plate 12. Gully erosion in Tertiary sediments — Droughty Point.

investigation may be necessary as well as the investigation of individual development sites, as the landslides may start a significant distance upslope.

Other small landslides on the foreshore at Taroona are aggravated by significant portions of the base or toe of the landslides being removed by cliff erosion and undercutting at the foreshore by the River Derwent. The removal of toe support can be a significant factor in initiating or accelerating landslide movement (Table 2).

Tertiary sediments contain expansive clay minerals which readily absorb water, making them susceptible to seasonal expansion and contraction. These effects may be locally significant, and reinforced foundations and other construction precautions must be considered. Variations in sediment composition may also cause differential compaction when the soils are loaded. Excavations and cuttings should not be left exposed indefinitely, as they may be easily eroded. However as Tertiary sediments usually occur in flatter areas, the requirement for excavation is minimal. Potential expansive soil problems may exist in these areas; these conditions sometimes occur at locations such as Taroona.

SEPTIC TANK SUITABILITY

The great variation in sediment and soil type within the Tertiary sediments means that careful individual site classification by competent specialists is necessary. Areas of high clay content may be unsuitable because of low permeabilities, or susceptibility to tunnel and gully erosion should the clay be dispersive. Perched water tables may inhibit effluent absorption in some areas, and pollution of both surface water and groundwater may result. Perched water tables may occur in areas where there are variations in the permeability of underlying soils or sediments. Impermeable clay layers may inhibit the downward infiltration of water, causing localised raised water tables, above the level of the regional water table. Extensive use of modified effluent disposal systems may be necessary in these areas.

GROUNDWATER

Although the overall porosity of the Tertiary sediments may be 20–30%, water has only been recovered from sand and gravel. The clays yield no water. Yields may be in the order of 0.25–0.50 L/sec (200–400 gal/hr), but water quality is poor. Although it may be used for watering stock, the water is unsuitable for domestic purposes or irrigation.

QUATERNARY SEDIMENTS

GEOLOGY

Talus, scree and slope deposits

Talus, scree and slope deposits have been grouped together on the accompanying maps. These deposits can be described as the accumulation of fragments resulting from the mechanical weathering of bedrock; the material is formed *in situ* or as a result of transport downslope by gravity over a short distance, and deposits usually take the form of accumulations of coarse debris at the foot of cliffs and steep slopes. The ground slope adopts the angle of repose for the material, usually 25–35°. Scree usually consists of pebbles and boulders but is devoid of finer material such as clay and soil. Talus usually contains more that 10% soil. However both scree and talus have had fine particles removed by percolating water. Slope deposits, as recognised on the accompanying maps, are similar to scree and talus but include clay, silt and sand as matrix material.

In the Greater Hobart area talus, scree and slope deposits may be derived from Permian sediments, Triassic sediments, dolerite, and basalt. By far the most extensive deposits are those occurring downslope of dolerite outcrop. The minor deposits derived from the Permian and Triassic sediments and basalts have been included within the *Soils* section of the individual units. The mapped deposits comprise angular blocks of dolerite up to 4 m in diameter, sometimes in a clay/sand/gravel matrix, usually occurring at high altitudes about mountains and hills capped with dolerite. Localised smaller deposits may exist in lower areas at the base of smaller dolerite features (e.g. Rushy Lagoon, Sandford, and Summerleas). The dolerite blocks exhibit little weathering, and developed "soils" are insignificant in extent and not usually of concern to the engineer. Excavation within these deposits can be difficult, depending on the size of the boulders. This material can be extremely unstable and deep cuttings should be avoided; failure may occur if substantial surface water reaches steep slopes or embankments.

Landslides in talus, scree and slope deposits mostly occur at high altitudes and on steep slopes. The deposits have a high porosity and permeability, are poorly sorted, usually clay rich, and are capable of mass movement when wet.

Stable and mobile dune sand

Dune sands are generally associated with many present beaches, i.e. Kingston, Nutgrove, Bellerive, Howrah, Seven Mile, Roches, Cremorne, Clifton, Calverts, Hope, South Arm, Mitchells, Musks, Gorringes, Huxleys, and Richardsons. The dunes are small, localised, and show little, if any, soil development.

Raised-beach sand

Raised-beach sand deposits are present on the Seven Mile Beach spit, South Arm spit, and at several locations around South Arm. Smaller localised deposits exist at Snug Bay. These deposits generally occur in areas close to present beaches. They often form a series of low beach ridges which may contain broken shell fragments. Soil development is minimal.

Alluvium, gravel, sand and clay

Deposits of alluvium occur at Montrose, Margate, Snug and various minor localities in the Greater Hobart area. They are usually less than two metres thick and are found bordering most of the larger streams. Several different types of deposit have been grouped under this heading, including some deposits where land has reclaimed by depositing fill. The alluvium deposits may therefore be composed of clay, sand or gravel, or any combination of the three. Gravel deposits are dominantly derived from dolerite, and are extensively quarried for fill and road base material.

Beach sand, estuarine sand and clay

Well-developed beaches have formed in south-east Tasmania in response to the small average tidal range. At Ralphs Bay extensive tidal flats, in excess of one kilometre in width at low tide, have developed. Similar but less extensive units occur in North West Bay.

Windblown sand sheets

Windblown sand deposits occur extensively in the eastern portion of the Greater Hobart area at South Arm, Sandford, Mortimer Bay, Seven Mile Beach and Lauderdale. Soils developed on Quaternary windblown sand are very similar to soils developed on Triassic sediments.

When observed in profile, two broad subdivisions of windblown sand deposits may be recognised by the degree of soil development. A series of aeolian sand deposits occur at Seven Mile Beach, to the east of Half Moon Bay, and extend through the settlement at South Arm to immediately east of Fort Hill. Dune topography is evident, broken shells are present, and the sand has little soil development. At Lauderdale, on the South Arm peninsula, and in various minor locations, the windblown sand is essentially featureless, with no distinct dune morphology. Podsol soils develop on this sand, and consist of a dark humic-rich, surface A_1 horizon and a lower, bleached A_2 horizon overlying an iron-rich B_2 horizon. Groundwater podsols have developed in some areas, characterised by very thick, cemented iron-rich "coffee rock" B_2 horizons. These soils can only be differentiated when examined in profile. It is important to identify the soil types, as the groundwater podsol can often cause problems with septic tank and household effluent disposal, as infiltration may be restricted at the B_2 "coffee rock" horizon. This is the case in many locations at South Arm. In all areas where foundations cannot be tied to bedrock, some settlement and differential compaction can be expected. Foundations should therefore be designed accordingly.

RESOURCES AND LAND USE

Land underlain by Quaternary sediments and associated soils has varied uses, associated with the nature of the sediments. Talus, scree and slope deposits are present in areas of very restricted use to the developer. These areas are predominantly used for nature conservation, water catchment and recreational pursuits. Alluvium, clay, sand and gravel occur in many isolated locations, and therefore have not been described with reference to a particular land use category. The various sand types, covering extensive areas within the Greater Hobart area, are used for grazing, minor cropping, orcharding, sand mining, forestry (pine plantations), nature conservation, recreation, holiday home development and, more recently, residential subdivision. Sand mined from Quaternary sediments is used extensively for concrete manufacture and glass making. A summary of quarrying operations is presented in Appendix 5.

HAZARDS

Of all the Quaternary age deposits, talus, scree and slope deposits are the most susceptible to instability. Instability is generally related to the clay type and content of the deposits. The clay content is often unpredictable, as the occurrence of numerous surface pebbles and boulders does not always reflect the conditions at depth, where boulder content may be low.

The talus and other slope deposits may also show little evidence of surface streams but may have water flowing at depth, along the interface between the deposit and the underlying bedrock.

The presence of clay and groundwater, in conjunction with steep surface slopes, may cause instability. Excavations must therefore be examined for stability, and suitable retaining structures provided if required. Any development of these areas should recognise potential instability, both at the planning and development and building stage.

Other areas of potential instability may occur where alluvial deposits are exposed in stream banks, particularly where the banks are steep or undercut by the stream.

Sandy Quaternary-age deposits are not generally prone to instability or erosion by water, apart from areas adjacent to streams, rivers or the sea. Localised wave erosion does occur in coastal areas.

Wind erosion is a potential hazard in exposed areas underlain by sand deposits. Sand-sized particles are easily transported by wind. The removal of vegetation by fire or other means, particularly on previously stabilised dunes and sand sheets, may initiate wind erosion forming ‘blow outs’. Sometimes these ‘blow outs’ are in the form of crescent-shaped dunes which can be subsequently difficult to stabilise.

SEPTIC TANK SUITABILITY

Areas underlain by talus, scree and slope deposits are not generally suitable for development, and although a modified system may be utilised in some situations, these areas are generally unsuitable for septic tank installation.

Other, more sandy, Quaternary sediments are better suited for the installation of septic tanks. Groundwater quality should be monitored carefully, as effluent can penetrate to great depths of permeable sand, destroying this valuable water resource. In areas previously thought to contain soils with a sand A horizon and sand B horizon some soils with sand A horizons and clay B horizons have developed. These may be unsuitable for normal septic tank installation, and are almost impossible to map from surface exposure. Test pits are the most suitable investigative tool in these situations.

GROUNDWATER

Provided that they are of sufficient thickness for a water table to exist within them, alluvial deposits found in valley floors adjacent to streams can be excellent suppliers of groundwater. Similar comments apply to sand deposits in the Seven Mile Beach and South Arm areas. Groundwater can be obtained from shallow bores in dunes and sand sheets. Deeper bores tend to produce saline water. A clay layer within the sand deposit may separate good quality water from saline water. Many successful shallow spear bores have been installed in the Clarence Municipality, although quality and yield are extremely variable.

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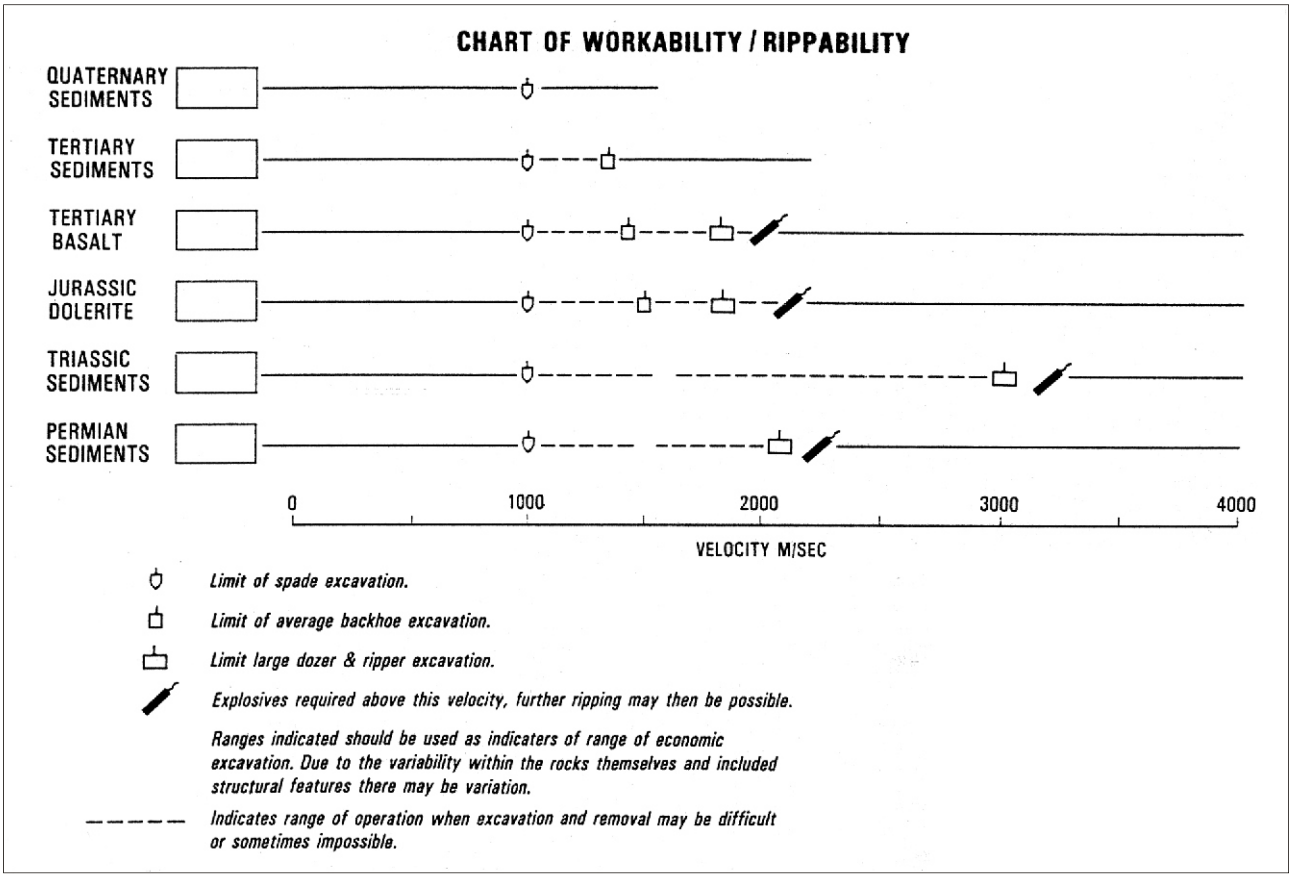
APPENDIX 1

Chart of workability/rippability (modified from Leaman, 1971*b*)



APPENDIX 2

Information legend from Engineering Geology maps (Hofto, 1990)

	UNIT DESCRIPTION	SOIL DESCRIPTION	SOIL DETAILS: USC	SOIL DETAILS: Thickness (m)	ATTERBERG LIMITS: Liquid Limit %	ATTERBERG LIMITS: Plasticity Index	ATTERBERG LIMITS: Linear % Shrinkage	% passing 75 um sieve	BEDROCK DETAILS: Bed Thickness (m)	BEDROCK DETAILS: Joint Frequency (/m)	BEDROCK DETAILS: Seismic Velocity (m/sec)	HAZARDS	RESOURCES	SEPTIC TANK SUITABILITY	GROUNDWATER BORE YIELD l/sec (gal/hour)	GROUNDWATER QUALITY (TDS ppm)
QUATERNARY	Windblown sand sheets.		SP										Sand	Generally suitable. Caution in areas where sands cover clay pans. Possible groundwater contamination in areas of high water table.	0.03 – 3 (24 – 2,400)	
QUATERNARY	Beach sand, estuarine sand and clay.		SP · SC	0 – 5+ variable		Non plastic		< 10			500 – 1500					
QUATERNARY	Alluvium, gravel, sand, clay, fill, reclaimed land.		SP, GC · SC										Gravel			
QUATERNARY	Raised beach sand.		SP										Sand			
QUATERNARY	Stable and mobile dune sand.		SP										Sand			
QUATERNARY	Talus, scree and slope deposits. Slope wash material derived downslope from dolerite and Permian sediments. Weathering usually insignificant.	Generally non existent.	GP · GC	0 – < 1 variable		Non plastic					900 – 1600	Potential landslides on steeper slopes or unsupported cuts. Variable compaction possible.	Gravel	Areas usually unsuitable due to steep slopes. Some potential in low density residential areas.	0.3+ (240+)	1000 – 5000 (>2000 Average)
TERTIARY	Agglomerate, clay, sand and cemented gravel-valley – fill sediments. Dolerite and sandstone derived material present as late stage landslide deposits.	Variable from thin grey yellow sand to brown sandy clay/clay.	SM SC · CH	0 – 3+ variable	24 – 60 (50)	6 – 40 (22 – 30)	4 – 15	60 – 90			500 – 1500	Gully and tunnel erosion common on cleared slopes.	Sand Coarse Gravel	Areas of high clay content may be unsuitable due to low permeability.	0.03 – 1.1 (24 – 9,000)	1000 – 5000 (> 2000 Average)
TERTIARY	Basalt, fine to coarse grained, and red clay with basalt boulders. Weathering may be extreme and variable.	Red brown high plasticity clay/sandy clay, variable thickness, sometimes containing basalt fragments.	CH · CL	0 – 2+	45 – 58	25 – 33	13 – 16	50 – 80			1800 – 2500 weathered 3000 – 7000 unweathered	Potential landslides and soil creep on steep slopes with thick soils. Possible foundation movement due to expansive clays.	Gravel	Areas of high clay content may be unsuitable due to low permeability.	0.03 – 5.6 (24 – 5,000)	
JURASSIC	Dolerite, fine to medium grained, hard, often strongly jointed. Weathering variable, both in vertical and lateral extent – especially in fine grained intrusions.	Brown clay, medium to high plasticity. (Dominant soil type on dolerite.) Light brown sandy clay. (Thin stony soils often surrounding dolerite outcrop.) Black clay, high plasticity. (Thin soils with sharp transition to slightly weathered bedrock.)	CH · CL CL · SC CH	0 – < 1 0 – 0.5 0 – 0.3	50 – 80 (50 – 60) 99 – 112	27 – 50 (30 – 40) 50 – 85	14 – 23 (20) 21 – 28	55 – 77		< 4 – 5	1700 – 2500 weathered 3000 – 7000 unweathered	Potential landslides and soil creep on steep slopes with thick soils. Possible foundation movement due to expansive clays.	Gravel Building Stone (minor)	Areas of high clay content may be unsuitable due to low permeability. Black clays unsuitable.	0.03 – 1.0 (24 – 800)	500 – 1000 (800 Average)
TRIASSIC	Micaceous quartz sandstone, white feldspathic sandstone and micaceous mudstone. Sometimes coal bearing. Mudstone particularly susceptible to deep weathering. Sandstone bedrock shows deep graditional weathering below sharp soil transition.	Yellow grey sand of variable thickness, overlying yellow white sandy clay. Sand fine grained similar to windblown sand. Clay variable thickness. Black, high plasticity clays may be present where dolerite intrudes Triassic sediments.	SP CH · CL	0 – 1+ 0 – 3+	35 – 51	21 – 40	2 – 11 (10)	50 – 80	1 – 2 (sandstone) 0.05 (mudstone)	< 1 – 2	1000 – 2000 weathered 2500 – 3000 unweathered	Gully and tunnel erosion common on cleared slopes.	Sand Gravel Building Stone (minor)	Generally suitable. Areas of shallow bedrock or soils with high clay content may be unsuitable. Care with erosion at outlet.	0.01 – 0.7 (8 – 560)	100 – 5000 (1200 Average)
PERMIAN	Fine sandstone, coarse siltstone, fossiliferous mudstone, with occasional thin conglomerate and limestone beds. Weathering usually shallow. Fretting of surface outcrops common. Occasionally deeply weathered to clay.	Variable from thin yellow grey silty sand to gravel. Often overlies thick yellow clayey gravel/clay. Soil composition extremely variable over very short distances.	SM CL · CH	0 – 0.5 0 – < 2	21 – 68 (25 – 30)	3 – 49 (14 – 18)	1 – 17 (4)	50 – 94	0.2	< 4	1000 – 2500 weathered 3000 – 5000 unweathered	Gully and tunnel erosion, and landslides common on cleared slopes. Sheet erosion common on rocky hilltops.	Gravel Clay Limestone Building Stone (minor)	Generally suitable. Areas of shallow bedrock or soils with high clay content may be unsuitable. Care with erosion at outlet.	0.25 – 1.0 (200 – 800)	100 – 2000 (<1000 Average)

* Common value range indicated in brackets.

APPENDIX 3

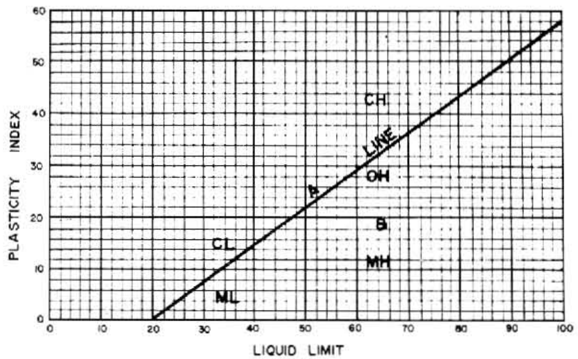
Unified Soil Classification system
(from Moon, 1980)

SAA CODE OF PRACTICE FOR SITE INVESTIGATION

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			Group Symbols	Typical Names	Field Identification Procedures (Excluding particles larger than 15 mm [3"] and basing fractions on estimated weights)	Laboratory Classification Criteria		Information Required for Describing Soils
COARSE GRAINED SOILS More than half of material is larger than 0.075 mm (BS No. 200 Sieve)	GRAVELS More than half of coarse fraction larger than 5 mm (BS 3/16" Sieve)	CLEAN GRAVELS Little or no fines	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.	Less than 5% smaller than 0.075 mm: GW, GP, SW, SP. More than 12% smaller than 0.075 mm: GM, GC, SM, SC. 5% to 12% smaller than 0.075 mm: Borderline cases requiring use of dual symbols	$C_u = \frac{D_{60}}{D_{10}}$ Greater than 6. $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	Give typical name, indicate approximate percentages of sand and gravel; max. size, angularity, surface condition and hardness of the coarse grains, local or geological name and pertinent descriptive information, and symbol in parentheses. For undisturbed soils add information on stratification, degree of compactness, cementation and moisture conditions. Example: Silty sand, gravelly; about 20% hard, angular gravel particles 12 mm max. size; rounded and subangular sand grains coarse to fine, about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand (SM).
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.		Not meeting all gradation requirements for GW.	
		GRAVEL WITH FINES Appreciable amount of fines	GM	Silty gravels, gravel-sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (For identification procedures see ML below.)		Atterberg limits below "A" line or PI less than 4. — Atterberg limits above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols	
			GC	Clayey gravels, gravel-sand-clay mixtures.	Plastic fines. (For identification procedures see CL below.)		Atterberg limits above "A" line with PI greater than 7.	
	SANDS More than half of coarse fraction smaller than 5 mm (BS 3/16" Sieve)	CLEAN SANDS Little or no fines	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.		$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4. $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP	Poorly-graded sands, gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.		Not meeting all gradation requirements for SW.	
		SANDS WITH FINES Appreciable amount of fines	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (For identification procedures see ML below.)		Atterberg limits below "A" line or PI less than 4. — Atterberg limits above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols	
			SC	Clayey sands, sand-clay mixtures.	Plastic fines. (For identification procedures see CL below.)		Atterberg limits above "A" line with PI greater than 7.	

Major Divisions		Group Symbols	Typical Names	Identification Procedure on Fraction Smaller than 0.4 mm (BS No. 36 sieve) size: Dry Strength (Crushing characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)	Information Required for Describing Soils
FINE GRAINED SOILS More than half of material is smaller than 0.075 mm (BS No. 200 Sieve)	SILTS AND CLAYS Liquid limit less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, colour in wet condition, odour if any, local or geological name and other pertinent descriptive information and symbol in parentheses. For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, and moisture condition. Example: Clayey silt, brown, slightly plastic, small percentage of fine sand numerous vertical root holes, firm and dry in place, loess (ML).
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty.	Medium to high	None to very slow	Medium	
		OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	
	SILTS AND CLAYS Liquid limit greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to Medium	
		CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High	
		OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	
Highly Organic Soils		Pt	Peat and other highly organic soils.	Readily identified by colour, odour, spongy feel and frequently by fibrous texture.			



BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand with clay binder.

LATERITIC SOILS. These soils may be classified texturally in accordance with the above system, but their properties may be inconsistent with accepted usage because of their tendency to harden on exposure to atmospheric conditions.

FIELD IDENTIFICATION PROCEDURES FOR FINE GRAINED SOILS OR FRACTIONS

These procedures are to be performed on the minus 0.4 mm (BS No. 36 Sieve) size particles

DILATANCY (Reaction to shaking)
Prepare a pat of moist soil with a volume of about 10 mm³. Add enough water if necessary, to make the soil soft but not sticky. Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens and finally it cracks or crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing is a measure of the dilatancy. Very fine clean sands give the quickest and most distinct reaction whereas clays have no reaction. Inorganic silts, such as a typical rock flour, show a moderately quick reaction.

DRY STRENGTH (Crushing characteristics)
Mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air drying and then test its strength by breaking and crumbling between the fingers. Fine sand feels gritty whereas typical silt has the smooth feel of flour.

TOUGHNESS (Consistency near plastic limit)
A specimen of soil about 10 mm³ in size is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled out by hand on a smooth surface or between the palms into a thread about 3 mm in diameter. The thread is then folded and rerolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity and crumbles when the plastic limit is reached. After the thread crumbles, the pieces should be lumped together and a slight kneading action continued until the lump crumbles.
The toughness of the thread near the plastic limit and the stiffness of the lump when it finally crumbles is indicative of the clay content of the soil.

APPENDIX 4

Water bore database summary

Ref No.	Owner	Location	AMG Coords	Quad	Card No.	Rock	Year	Depth	DWS	SWL	Cased	Yield	TDS	Cond	Anal	Driller
1	Royal Tas. Bot. Gardens	Hobart	526752544	82	139	A	83	56	40			0.25	1800		1	MD
2	H. Calvert	Lauderdale	540752516	82	7	4	63	39.6	7.6	6.1	12.2	0.32		3143		MD
3	G. Casimaty	Acton View Cambridge	539252542	82	16	3	56	43	30.8			0.25				MD
4	G. Casimaty	Cambridge	529052545	82	17	3	56	33.8	21.2	19.5		0.24				MD
5	G. Casimaty	Cambridge	539352543	82	18	3	56	33.5	21.3	10.7		0.25				MD
6	Gregg	Cambridge	535352593	82	29	2	56	10.8								MD
7	Kennedy	Cambridge	537252573	82	52		42	4.6								Army
8	Kennedy	Cambridge	537152575	82	53	A	24	11								Army
9	Kennedy	Cambridge	537352576	82	54	A	24	11	11			0.04				Army
10	Kennedy	Cambridge	537352577	82	55	2	24	26.2	11							Army
11	Kennedy	Cambridge	537152577	82	57											Army
12	P. Manning	Cambridge	536352600	82	64	A	79	39.7	12.5	6.1	3.7	1.9	1390		1	Richards
13	L. Matthews	Cambridge	534752590	82	65	3	81	26.8	9.1	7.3		1.1				TDC
14	D. Martin	Cambridge	538252568	82	71	2	61	22	13.7		15.7	0.32				MD
15	E. Sutcliffe	Cambridge	538352551	82	78	2	61	51.8				0.02				MD
16	E. Sutcliffe	Cambridge	538352551	82	79	2	61	57.9								MD
17	E. Sutcliffe	Cambridge	538352551	82	80	2	61	57.9								MD
18	A. Wicks	Rokeby	539352508	82	85	2	60	45.7	6.1		9.9	0.1				MD
19	S. Ward	Sandford	539252439	82	89	B	80	48.8								TDC
20	S. Ward	Sandford	539552441	82	90	B	80	45.7								TDC
21	G. Casimaty	Cambridge	539052556	82	94	3	56	25	22.6		0	0.25	4886		1	MD
22	Gregg	Cambridge	535452592	82	96	2	56	24.1	23.8		19.8	0.4	1222		1	MD
23																
24	L. Matthews	Cambridge	534752590	82	100	3	81	31.7	26.8	9.1	31.7	2.15	1010		1	TDC
25	H. Manson	Rokeby	535652507	82	101	4	63	37.8	18.3		6.5	0.08	44117		1	MD
26	R. McKay	Cambridge	536452582	82	102			26.8		16.2			1571		1	
27	D. Martin	Cambridge	538252575	82	103	2	61	24.1	12.2	0.3	13.9	0.13	4919		1	MD
28	E. Sutcliffe	Cambridge	538252551	82	106	3	61	44.2	38.1	21.3	5.6	0.19	2706		1	MD
29	D. Crosswell	Sandford	539652404	82	126	4	81	54.9	24.4	18.3	54.9	2.15				TDC
30	P.R & C.M Lazenby & Son	Sandford	540252408	82	129	4	81	79.3	24.4	18.3	79.3	0.74	1930		1	TDC
31	O'Brian	Sandford	537352456	82	135	4	82	40	20			0.6	4160		1	TDC
32	D. Burn	Clifton Beach	543352402	83	1	0	68	12.8	11.3	3.7		0.38				TD
33	B. Contencin	Sandford	542052433	83	4	2		36.6								SD
34	Griffiths	Sandford	540952428	83	11	4	81	39.6	32.3	18.3	39.6	0.5				SD
35	R. Patterson	Sandford	544152418	83	20	4	80	35.4								TDC
36	R. Patterson	Sandford	541152433	83	21	2	82	36.6								SD
37	T. Pipkin	7 Mile Beach	541152543	83	24	02	56	38.4								MD
38	K. Rycroft	Sandford	541052427	83	26	4	82	41.6	36.6		41.6	0.38				SD
39	J. A. Stones	Narrawa Clifton Beach	541052427	83	33	4	82	37.2	32.3	17.7	37.2	0.75				SD
40																
41																
42	C. Cane	Clifton Beach	543052403	83	54	2	60	11	10.4		10.1	0.2				MD
43	D. Damoth	Clifton Beach	542552401	83	55	0	67	18.3				0.2				TD
44	A. Morrisby	Cremorne	542852443	83	56	2	60	13.7	10.7			0.12				MD
45	E. J. Watson	Clifton Beach	542152396	83	57	4C	60	31.4								MD
46	E. J. Watson	Clifton Beach	542152397	83	58	4	64	7.6								TD
47	B. Wiggins	Clifton Beach	543252404	83	59	2	61	10.7	6.1		10.4	0.12				MD
48	Tasmania Golf Club	Cambridge	541252590	83	85	3	0	76.2				0.75				Phillips

Ref No.	Owner	Location	AMG Coords	Quad	Card No.	Rock	Year	Depth	DWS	SWL	Cased	Yield	TDS	Cond	Anal	Driller
49	J. Fught	Half Moon Bay, South Arm	533052381	88	43		81	15.2	7	4.9	15.2	0.4				SD
50																
51	J. Smit	Half Moon Bay, South Arm	533552378	88	99		82	18.3	3.1	1.8	18.3	0.5				SD
52	N. Lucas	Kingston	522352422	82	58	3	62	21.3	12.2		12.2	0.5				MD
53	T. Pearsall	Kingston	523752401	82	74	3	64	30.5	6.1		9.8	0.38				MD
54																
55																
56																
57	J. Krause	Electrona	520752338	88	64		64	23.8	12.2		6.1	0.3		1428		MD
58	N. Worsley	Margate	520552361	88	118		69	13.4								MONO
59	N. Worsley	Margate	520752374	88	119		69	2.1								MONO
60	N. Worsley	Margate	520352373	88	120		69	4.3								MONO
61	H. Thompson	Beach Road Margate	521752359	88	133		64	29.4	7.6		13.7	0.43				MD
62	Tasmania Golf Club	Barilla Bay	541452593	UR 73/64		0	84	51.2	24.4	11	24.4	5.05	2660	4700	11	
63	Hampton	Clifton Beach	541452408	UR 73/69		04										
64	Edwards	South Arm	533752360	UR 76/30		0	73		3	3						
65	Fenton	South Arm	533852381			03	76	11	1.5	1.5						
66	Fenton	South Arm	534052381	UR 76/11		04	76		2.3	2.3		0.5	500		1	MD
67	Robb	South Arm	534152355	UR 72/33		0	72									
68	McKay	Cambridge	535852588	UR 87/50		3	87	73	48.8	2.13		0.37			2	
69	South Arm Primary School	South Arm	534152360	UR 87/41		0	87	7.6		5.08	6.8	0.17			2	
70	Keenan	South Arm	534152367	UR 83/51		01	83	6								
71	Assman	Mortimer Bay	539952422	UR 76/25		02	76	12								
72	Young	Roches Beach Road	539552512	UR 75/12		3	75									
73																
74																
75																
76	Royal Hobart Golf Club	Seven Mile Beach	540352554	UR 84/32		02	84	14	2							
77	Royal Hobart Golf Club	Seven Mile Beach	540452547	UR 81/3		01	81	13.3		2.2		0.55	512	830		
78	Brooks	Tinderbox Road	526152365	UR 73/87		34	73									
79																
80	Kingston Golf Club	Kingston	526052415	UR 84/61		01	84	7	2			1.1	700			
81																
82	Hobart Show Society	Derwent Park	523352577	82	148	C	84	29	13.7							GSD
83	H & J Calvert	Opossum Bay	532952410	82	150	1P	84	39.6	34.1		36	1.5				GSD
84	Grubb	Sandford	533452390	82	155	3	85	61	27.4	12.2	22.7	1				S&M
85	Carter	Opossum Bay	532952403	82	158	3	84	54.8								GSD
86	Richmond Golf Club	Cambridge	536452593	82	159	3	87	66			42					MD
87	Grubb	Opossum Bay	533152390	82	162	4	87	90								MD
88	Seabrook	Opossum Bay	532752390	82	165	4	87	72	63		72					MD
89	Seabrook	Opossum Bay	532752390	82	166	4	87	72	59		72					MD
90	Essex	Rifle Range Road	538552428	82	169	4	88	78	30	6						MD
91	Edwards	Cambridge	534952597	82	170	3	88	42	28		42					MD

Ref No.	Owner	Location	AMG Coords	Quad	Card No.	Rock	Year	Depth	DWS	SWL	Cased	Yield	TDS	Cond	Anal	Driller
92	University of Tasmania	Sandy Bay	526952497	82	172	B	87	48.8	24.4	ART	42.7					GSD
93	Tucceri	Cambridge	535552587	82	173	4	88	60								MD
94	Tucceri	Cambridge	535552587	82	174	4	88	54	24		54					MD
95	Mollon	Blackmans Bay	525352373	88	72	3	82	70.1	35.1							SD
96	Manning	South Arm	533752377	88	73	0	82	18.3	18.3	4.6	18.3					SD
97	Waterworth	Margate	521752357	88	121	C	63	3.7								TD
98	Clarence Council	South Arm	533952357	88	140	14	77	4.9								MONO
99	Lewis	South Arm	533652346	88	183	4	84	61	54.3			0.19				GSD
100	Dutch	South Arm	534552377	88	192	4	87	72								MD
101	Eaton	Tinderbox Rd	527252346	88	193	C	87	109.7		15.2	109.7					GSD

All depths in metres   All analyses in mg/L   All conductivities in S/cm   All yields in L/sec

LEGEND

Ref No.	map reference number	SWL	Standing Water Level (m)
AMG	AMG co-ordinates	Case	Depth of casing (m)
Quad	Quadrangle number	Yield	Yield of bore (litres/second)
Card	Division of Mines reference card number	TDS	Total Dissolved Solids (mg/L)
Rock	Rock type (see key below)	Cond	Conductivity of water (S/cm)
Year	Year hole drilled	Anal	Number of water samples analysed
Depth	Total depth drilled (m)	Driller	Hole drilled by (see below)
DWS	Depth Water Struck (m)		

DRILLING COMPANY

TDC	Tasmanian Drilling Company
SD	Southern Drillers
MD	Mines Department
TD	Tasmanian Drillers
S&M	Stevens & McCall
GSD	Gerald Spaulding Drillers
MONO	
RICHARDS	
PHILLIPS	
ARMY	

GEOLOGY

0	Coastal sands	5	Mathinna sediments	A	Precambrian dolomite
1	Quaternary alluvium	6	Ordovician	B	Tertiary basalt
2	Tertiary sediments	7	Gordon Limestone	C	Jurassic dolerite
3	Triassic	8	Cambrian	D	Granite
4	Permian	9	Precambrian		

ANALYSES OF WATER SAMPLES

Sample No.	1	12	21	22	24	25	26	27	28	30	31	62	66	68	69	77
pH	7.6	7.7	7.9	8.2	7.6	7.8	9	7.8	8.3	7.2	6.4	6.2	7	7.2	7	7.6
Conductivity (S/cm)	2260	1750	650	8	1470	0	0	0	0	3100	3600	4700		3030	490	830
Item (mg/l)																
CO_3	0	0	0	58	0	325	41	40	0							
HCO_3	595	560	404	390	570	0	337	379	365	435	35	130	210	740	85	430
Cl	720	470	2320	386	315	1906	632	2450	1200	840	1870	1470	590	710	83	115
SO_4	32	54	247	39	26	305.9	50	215	81	145	220	46	220	92	43	46
SiO_2	40	62	36	47	44	48.4	17	32	49	20	80		13			16
Ca	73	51	274	85	76	123.8	51	133	164	84	14	90	58	78	3.3	120
Mg	190	66	414	103	80	252	88	260	235	68	120	125	58	110	1.8	14
Fe	0.1	0.1	0	0	0.1	0	0	0	0	0.1	0.1	0.1	5.6	0.1	0.1	0.1
Al	0.2	0.2	0	0	0.2	1.2	0	0	0	0.2	0.2	0.2		0.2	0.2	0.2
K	7.3	14	18.5	3.5	3.7	0	8	17.5	8	9.8	25	52	8.3	10.5	2	3.8
Na	300	280	806	229	175	4013	416	1213	477	580	720	690	420	620	115	78
TDS	1800	1390	4886	1222	1010	44117	1571	4919	2706	1930	4160	2830	1560	1930	350	620
Alkalinity (as $CaCO_3$)	485	470	329	464	465	0	379	377	411	355		105	170	600	70	350
Hardness (Permanent)	480	0	2059	172	0	0	110	1025	965	490	500	630	380	43		357
Hardness (Temporary)	486	400	329	464	519	0	379	377	411	30	105	170	600	15.5	350	

APPENDIX 5

Construction materials database summary

NO	**SITE REFERENCE NUMBER ON MAP**
REF NO	**DATABASE REFERENCE NUMBER**

TE	**LAND TENURE**
NP	National Park
CA	Conservation Area
SF	State Forest
FH	Freehold
CL	Crown Land
OT	Other

US	**PLANNING AUTHORITY LAND USE**
QP	Quarrying permitted
QN	Quarrying not permitted
QD	Quarrying discretionary

RES	**RESERVES (tonnes)**
NOT	Not determined
NIL	<1 000
SML	1 000–10 000
MED	10 000–1 000 000
LGE	1 000 000–1 000 000 000
VST	>1 000 000 000

OPS	**OPERATIONAL STATUS**
FOP	Fully operational
OCC	Occasional
ABN	Abandoned
NEW	New area

COL	**COLOUR**
LT	Light
DK	Dark
WH	White
BK	Black
GR	Grey
YL	Yellow
BR	Brown
RD	Red
MO	Mottled

EX	**EXTRACTABILITY**
BH	Backhoe
EX	Excavator
DZ	Bulldozer (D9)
BL	Blasting

USC	**UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL**
	See Appendix 3

USES	**USES**
CA	Crushed aggregate
RS	Road sub-base
RB	Road base course
RA	Road admixture
RW	Road wearing (sealed)
RU	Road unsealed
RH	Road hotmix sand
CC	Concrete coarse aggregate
CF	Concrete fine aggregate
CP	Concrete pipe
CB	Concrete block
CT	Concrete tile
LW	Lightweight aggregate
SM	Sand mortar
SF	Sand filtration
SN	Sand foundry
SG	Sand glass
SB	Sand brick
SD	Sand bedding
BC	Brick clay
EC	Earthenware clay
PC	Porcelain clay
FC	Filter clay
BS	Building stone
HM	Heavy mineral
SI	Silica
QL	Quick lime production

QU	**QUALITY**
M	Marginal
S	Satisfactory
E	Excellent

GP	**GEOPHYSICS**
Y	Yes
N	No

DR	**DRILLING**
Y	Yes
N	No

LA	**LABORATORY**
Y	Yes
N	No

Site	Ref No.	Co-Ords	Locality	Occupier	M LEASE	TE	US	RES	OPS	COL	EX	USCS	USES	QU	GP	DR	LA
1	82018	525152574	Lutana	Crown		fh	qn	sml	abn		dz		ca	s	n	n	n
2	82021	520552570	Glenorchy	G. Quon Construction	751P/M	fh	qn	med	fop		bl		ca	s	n	n	y
3	82022	520652548	Limekiln	Weily & Sons, G. J.	603P/M	fh	qn	med	fop		bl		ca	s	n	n	y
4	82055	517352584	Glenlusk			fh	qp	sml	abn		dz	GM	rs	s	n	n	n
5	82056	518352590	Collinsvale			fh	qp	nil	abn		dz	GM	rs	s	n	n	n
6	82057	517852626	Claremont	Ward, P.		fh	qp	sml	occ		dz	GM	rs	s	n	n	n
7	82058	518752628	Claremont	Vicary, M. F.& Zantuc	628P/M	fh	qn	nil	abn		dz	GM	rs	s	n	n	n
8	82059	517752639	Granton	Rayner, H.		fh	qp	sml	abn		dz	GM-GP	rs	s	n	n	y
9	82060	520952550	Tolosa Street	Weily, G. J.		fh	qn		abn		dz	GP	rs	m	n	n	n
10	82073	519352586	Berriedale	Jaques, R. E.		fh	qp	nil	abn		dz	GM-SM	rs	s	n	n	n
11	82074	520352617	Claremont	Crown		cl	qn	sml	fop		dz	GW-GP	rs	s	n	n	y
12	82084	519152608	Chigwell	Jay, K. C.		fh	qn	sml	occ		dz	GP-GC	rs	s	n	n	n
13	82089	517452622	Berriedale Road	Ward, P.		fh	qp	sml	occ			GP	rs,ru	s	n	n	y
14	82131	520252646	Austins Ferry	Hobart Brick Co.		fh	qp			br	dz		bc	s	n	n	n
15	82133	518152620	Claremont	Woolnough, E. (ex)			qp	med	new		dz		bc		n	n	n
16		518952587	Goats Hill Berriedale					not	abn		dz		rs				
17		519052549	Knights Creek reservoir					lge	abn		bl		ca,bs	s			
18		520052649	Ten Mile Hill					sml	abn		bl		bc	s			
19		522252620	Claremont Golf Club														
20		518152642	Black Snake Lane			fh		med	abn		bl		ql	s			
21		517752648	Black Snake Lane			fh		med	abn		bl		ql	s			
22		525552572				fh		med	abn		bl		qs	s			
23		524652515	W end Poets Road					lge	abn		bl		bs	s			
24		525752542	N Domain					lge	abn		bl		ca	s			
25		526252535	S Domain					lge	abn		bl		ca	s			
26	82005	525152488	Proctors Saddle	Bain, M.		fh	qn	med	abn		dz	GW	rb,rw,ru	s	n	n	y
27	82023	523952529	Giblin Street	Eiszele Estate		fh	qn	med	occ		bl		ca		n	n	y
28	82035	524852484	Proctors Saddle	Bain, M.		fh	qn	med	abn		dz	GC	rs	s	n	n	n
29	82036	524752480	Southern Outlet	Council		cl	qp	sml	abn		dz		rs,rb,rw,ru	s	n	n	n
30	82037	525352490	Proctors Road	Bain, M.		fh	qn	sml	abn		dz		ca	s	n	n	n
31	82038	525152487	Proctors Saddle	Bain, M.		fh	qp	nil	abn		dz	GP	rs,rb,rw,ru	s	n	n	n
32	82039	522052478	Fern Tree	Council		fh	qp	med	abn		dz	GP-GC	rs	s	n	n	n
33	82040	525352497	Dynnyrne			fh	qn	sml	abn		bl		ca	s	n	n	n
34	82070	525252480	Proctors Road	Crown		cl	qn	med	abn		bl	GP	ca	s	n	n	n

Site	Ref No.	Co-Ords	Locality	Occupier	M LEASE	TE	US	RES	OPS	COL	EX	USCS	USES	QU	GP	DR	LA
35	82071	522052521	Pottery Road			fh	qn	sml	abn		dz	GP	rs	s	n	n	n
36	82072	524152488	Ridgeway Road	Council		cl	qn	med	abn		dz	GP	rs	s	n	n	n
37	82082	523452482	Ridgeway Road	Council		cl	qn	sml	abn		dz	GP-GC	rs	s	n	n	n
38	82094	523552526	Giblin Street	Eiszele Estate		fh	qn	med	occ		dz	GC-GP	rs	s	n	n	n
39	82095	525652493	Proctors Road	Buckley, A. D. & Weily		fh	qn	med	abn		bl		ca	s	n	n	n
40	82132	524652522	Knocklofty	Crisp & Gunn (ex)		fh	qn	nil	abn	br	dz		bc		n	n	n
41	82137	523852544	New Town	Hobart Brick Co.			qn				dz		bc		n	n	n
42																	
43																	
44																	
45																	
46	82012	534852572	Cambridge	Crown		fh	qp	nil	abn		dz	SC	rs,rb,ru	m	n	n	y
47	82013	537852493	South Arm Road	Crown/Reynolds, C. D.		fh	qp	nil	abn		dz		rs,ru	m	n	n	n
48	82014	535052568	Cambridge	McConnen, H.		fh	qp	sml	abn		dz	GM	rs	s	n	n	y
49	82015	533752542	Mornington	Johnson, C. R.	646P/M	fh	qp	med	fop		dz	GW	rs,rb,rw,ru	s	n	n	y
50	82016	527452597	Risdon	Risdon Tavern		fh	qn	sml	occ		dz	GW-GC	rs,rb,rw,ru	s	n	n	y
51	82017	534852478	Droughty Point	Tas Finance Agency		fh	qp	med	abn		dz	GC	rs	m	n	n	n
52	82019	537352541	Mt Rumney	Crow, P. M.		fh	qp	med	occ		dz	GP	rs	s	n	n	y
53	82020	535852552	Mt Rumney	Graham, W. A.		fh	qp	sml	occ		dz	GP-GC	rs	s	n	n	y
54	82024	530652575	Flagstaff Gully	Pioneer Quarries	677P/M	fh	qp	med	fop		bl		ca	s	n	n	n
55	82027	529252534	Rosny Hill	PWD		cl	qn	med	abn		bl		ca	s	n	n	n
56	82029	533052565	Stringy Bark Gully	Crown		cl	qn	med	abn		dz	SC	rs,rb,ru	s	n	n	y
57	82030	533552568	Barilla Rivulet			cl	qn	sml	abn		dz	SC	rs,rb,ru	s	n	n	n
58	82031	534152515	Rokeby Road	Goodwin, C. E. estate	648P/M	fh	qp	med	fop		dz	GC-SC	rs,rw,ru	s	n	n	n
59	82032	532352553	Warrane	Von Bibra, K.		fh	qp	sml	abn		dz	SC	rs,rw,ru	s	n	n	n
60	82033	533052553	Warrane			fh	qn	nil	abn		dz	SC	rs	s	n	n	n
61	82034	531752557	Warrane	Von Bibra, K.		cl	qp	nil	abn		dz	SC	rs,rw,ru	s	n	n	n
62	82075	527452582	Risdon Cove	PWD		fh	qp	med	abn		dz	GC	rs	m	n	n	n
63	82076	526852595	Bowen Park	Clarence Commission		fh	qp	nil	abn			GP-GC	rs	m	n	n	n
64	82078	526652618						lge	abn		bl	CA-BS					
65	82081	536052598	Cambridge	Manning	909P/M	fh	qp	sml	occ		dz	GP	rs	s	n	n	y
66	82083	530652568	Flagstaff Gully	Clarence Commission		cl	qn	med	abn		dz		ca,rs	s	n	n	y
67	82085	535352568	Cambridge	McConnen, T.		fh	qn	sml	abn			GP	rs	s	n	n	n
68	82087	534452550	Mt Rumney	Andrews, C. L.		fh	qn	nil	abn			GP	rs	s	n	n	n

Site	Ref No.	Co-Ords	Locality	Occupier	M LEASE	TE	US	RES	OPS	COL	EX	USCS	USES	QU	GP	DR	LA
69	82088	540752439	Sandford	Morrisby, G. R.	970P/M	fh	qp	med	fop		dz	GC-GP	rs	s	n	n	y
70	82097	537652567	Cambridge	Walpole, T.		fh	qp	nil	abn	gr	bh	SP	sd	s	n	n	y
71	82098	539252523	Lauderdale	Lowe, V.		fh	qp	nil		gr	bh	SP	sm,sd	s	n	n	y
72	82099	540452464	Sandford	Calvert, A. H. & P. H.	860P/M	fh	qp	sml	fop	gr	bh	SP	sm,sd	s	n	n	n
73	82100	540352454	Sandford	Calvert, A. H.	860P/M	fh	qp	sml	abn	yl		SP	sm,sd		n	n	n
74	82104	539952480	Lauderdale	Clarence Council		cl	qp	not	new		bh	SP-ML	sm,sd	s	n	y	y
75	82118	539552527	Acton Road	Toronto Pastoral Co.		fh	qp	sml	abn	wh,gr		SP	sm,sd	s	n	n	y
76	82119	535152547	Mt Rumney			fh	qn	med	abn		bh	SP	sm,sd	s	n	n	n
77	82120	540752448	Sandford	Morrisby, G. L.	809P/M	fh	qp	sml	occ	wh,yl	bh	SC-SP	sm		n	n	y
78	82121	540052394	Sandford	Lazenby, E. H. & J.	808P/M	fh	qp	med	abn	wh	bh	SP	sn	s	n	n	y
79	82122	540352400	Sandford	ACI	813P/M	fh	qp	med	occ	wh	bh	SP	sn	s	n	n	y
80	82123	539452400	Sandford	Lazenby, E. H.	808P/M	fh	qp	sml	occ	wh	bh	SP	sn	s	n	n	n
81	82124	540152407	Sandford	ACI	813P/M	fh	qp	med	fop	wh	bh	SP	sn		n	n	y
82	82134	534752549	Tunnel Hill			fh	qn	med	new		dz		bc		n	n	n
83	82135	534952540	Mt Rumney			fh	qp	lge			dz		bc		n	n	n
84	82138	540852390	Sandford			fh	qp	not	new	yl	ex		bc		n	y	y
85	83020	542752455	Cremorne	E. O. Calvert		fh		med			dz	GC-SC	rs	m	n	n	y
86	83023	540952432	Cremorne	Crown		cl		sml	occ		dz	GP-GC	rs	m	n	n	n
87	83038	544752408	Clifton Beach	Clifton Beach P/L		fh					bh	SP	sg,sd		n	n	n
88	83039	541852464	Cremorne	A. R. & R. L. May	807P/M	fh		med	occ		bh	SP-SC	sg,sd		n	n	n
89	83041	541852549	Seven Mile Beach	Loongana Sawmills	804P/M	fh		med	abn		bh	SP	sm,sg,sd		n	n	y
90	83042	540952583	Seven Mile Beach	Commonwealth		cl		sml	occ		bh	SP-SC	sm	s	n	n	y
91	83043	540952469	Lauderdale	P. H. Calvert	860P/M	fh		sml	fop		bh	SM	sm,sd		n	n	n
92	83044	541052476	Lauderdale	P. H. Calvert	860P/M	fh		sml	abn		bh	SP-SM	sm,sd		n	n	n
93	83045	542452464	Cremorne	R. J. Millington		fh		nil	abn		bh	SP	sm		n	n	n
94	88065	539852364	South Arm	Long, C.		cl	qn	sml	abn	wh		SP	cf,sd	m	n	n	y
95	88066	539452380	South Arm	Werner, R.		fh	qp	sml	new		bh	SP	sd	s	n	n	y
96	88067	538452356	South Arm	Males, G. L.	784P/M	fh	qp	med	fop		bh	SW-SP	rh,cf	s	n	n	y
97	88068	539652364	South Arm	Gelibrand Estate		fh	qn	nil	abn	wh	bh	SP	cf		n	n	y
98	88069	536552352	South Arm	Calvert, D. G.	800P/M	fh	qp	med	fop	br	bh	SP	rh,cf		n	n	y
99	88072	534452343	South Arm	Calvert, D. G.	810P/M	fh	qp	sml	abn		bh	SP	rh,cf		n	n	y
100	89015	540952389	Musks Road	Castle, K. J. & M.	1094P/M	fh	qp	sml	abn		dz	GM	rb,ru	s	n	n	n
101	89018	541852378	Musks Road	Watson, A. P.	864P/M	fh		sml	abn		ex	SP	sg		n	n	y
102	89019	541052365	Calverts Beach	Crown		of	qn	med	new		ex	SP	sg		n	n	y

Site	Ref No.	Co-Ords	Locality	Occupier	M LEASE	TE	US	RES	OPS	COL	EX	USCS	USES	QU	GP	DR	LA
103	89020	541252366	Calverts Beach	Watson, A. P.	864P/M	fh	qp	sml	fop		ex	SP-SM	sg		n	n	y
104	89021	541252376	Musks Road	C. Martin Constructions	864P/M	fh	qp	sml	abn		ex	SP	sg		n	n	y
105		526952572	Shag Bay					lge	abn		bl						
106		529852596	Risdon Vale					sml	abn		dz		rs				
107		531252535	Mornington Hill					lge	abn		bl		bs				
108		533752520	Minow Street Dam					sml	abn		dz		rs				
109		533252550	Tunnel Hill					sml	abnm		dz		rs				
110		533252553	Tunnel Hill					sml	abn		dz		rs				
111		533452561	Tunnel Hill					sml	abn		dz		rs				
112		534952564	Tasman Hwy Cambridge					lge	abn		be		ca				
113		534152570	Hobdens Road Cambridge					sml	abn		dz		rs				
114		528552612	Risdon Brook Dam					sml	abn		dz		rs				
115		540152364	Calverts Beach					lge	abn		bh		cf				
116		533452350	Fort Direction Road					nil	abn		dz		rs				
117		538552371	Ralphs Bay					med	abn		bl						
118		534052391	South Arm														
119																	
120	82001	522052448	Summerleas Road	Kingborough Council		fh	qp	med	occ		dz	GP	ra,ru	s	n	n	y
121	82002	525852427	Proctors Road	Kingborough Council		cl	qp	sml	abn		dz	GP	rs	s	n	n	n
122	82006	525252447	Proctors Road			cl	qp	sml	abn		dz	GW-GM	rs,rb,rw,ru	s	n	n	y
123	82007	526052434	Proctors Road	Bones, I. M.		fh	qp	med	abn		dz	GC	rs	s	n	n	y
124	82061	525652427	Proctors Road	Pioneer Concrete		fh	qn	nil	abn		dz	GC	rs	m	n	n	n
125	82096	525752407	Kingston			fh	qn	sml	abn	wh	bh	SM	sd	s	n	n	n
126	82101	524652398	Boronia Hill	Pearsall, T.		fh	qn	sml	abn		bh	SP	sm,sd	s	n	n	n
127	82102	525452393	Blackmans Bay	Quinn, L.	943P/M	fh	qn	sml	occ	gr	bh	SP	sm,sd		n	n	y
128	82126	523652408	Kingston	Hobart Brick Co.	820P/M	fh	qn		abn	yl,br	ex	CL	sb		n	n	n
129	82128	526552424	Bonnet Hill	Kruse, H. D & D. I.	884P/M	fh	qp	med	fop	br	dz		bs	s	n	n	n
130	82136	523252408	Kingston			fh	qp				ex		bc,ec		n	n	n
131	88003	527652340	Tinderbox	Hale, E. M.	873P/M	fh	qp	sml	abn		dz	GW-GC	rb,ru	m	n	n	y
132	88018	527152340	Tinderbox	Hale, E. M.	873P/M	fh	qp	med	occ		dz	GP-GC	rs,ru	m	n	n	y
133	88019	527152340	Tinderbox	Hale, E. M.	873P/M	fh	qp	med	occ		dz	GP	rs,ru	m	n	n	n
134	88024	527052342	Tinderbox	Kingborough Council		cl	qp	med	abn		dz	GP	rs,ru	m	n	n	y
135	88030	520052311															
136	88033	525452368	Howden	Taylor, W.	874P/M	fh	qp	med	occ		dz	GW-GM	rb,ru	s	n	n	y

Site	Ref No.	Co-Ords	Locality	Occupier	M LEASE	TE	US	RES	OPS	COL	EX	USCS	USES	QU	GP	DR	LA
137	88038	521552356	Margate	Kingborough Council		cl	qn	nil	abn		dz		rs,ru		n	n	n
138	88053	521452339	Barretta	Marine Board		cl		med	fop		dz	SP-GP	rb,ru	s	n	n	n
139	88054	523452386	Blackmans Bay	Hazell Brothers		fh	qp	sml	abn		dz	GC	rs		n	n	n
140	88059	525352364	Howden			fh	qn	nil	abn		dz		rs		n	n	n
141	88060	524852363	Howden	Hazell Brothers	882P/M	fh	qp	sml	abn	rd	dz	CL	be	s	n	n	n
142	88061	524252358	Howden	Hazell Brothers	882P/M	fh	qp	med	fop	yl		CL	sb	s	n	n	n
143	88073	521452339	Margate	Marine Board		cl	qp	med	fop		bh	SP	cc		n	n	y
144	88074	525452385	Blackmans Bay			fh	qn	nil	abn	gr	bh	SP-SM	cf,sm,sd		n	n	y
145	88075	525352384	Blackmans Bay			fh	qp	sml	abn	gr	bh	SP	sm	m	n	n	n
146	88076	524452382	Blackmans Bay			fh	qp	sml	abn	gr	bh	SC	cf,sm,sd		n	n	n
147	88077	523452382	Blackmans Bay			fh	qp	sml	abn		bh	SP-SM	cf,sm,sd		n	n	n
148	88078	524152363	Howden	Hazell Brothers		fh	qn	sml	abn		bh	SP-SM	cf,sm,sd		n	n	n
149	88080	521352302	Lower Snug	Crown		cl	qp	sml	abn			SC	sm		n	n	n
150		521352340	Barretta (Electrona tip)														
151		523852387	Coffee Creek														
152		525452396	Boronia Hill Kingston														
153		520252410	Leslie Vale (Sth Out. Road)														
154		524352436	Firthside (Sth Out. Road)														
155		523552436	Labell Alliance														
156		524652479	Mt Nelson														
157		520052413	Sandfly														
158		520752641	Ten Mile Hill														
159		528852598	Risdon Vale														
160		533052596	Craigow Hill														
161		532752549	UPR 1973/21														

APPENDIX 6

Site investigation reference point summary

No Site investigation reference number

COORD AMG co-ordinate 4 digit easting, 5 digit northing

REF Source of information
- 1 P. Terry soil survey, 1983
- 2 P. Terry soil survey, 1984
- 3 R. Woolley soil survey, 1983
- D Dirtwork, Department of Mines laboratory and XRD analysis
- UR Unpublished Report, Department of Mines
- MD Mines Department internal report ?
- TR Technical Report, Department of Mines
- H209 P. Hofto site reference point

ROCK Rock type
- Ts Tertiary sediments
- Qsa Quaternary sand
- Qs Quaternary sediments
- Ps Permian sediments
- Tb Tertiary basalt
- Jd Jurassic dolerite
- Trs Triassic sediments

USC Unified Soil Classification System group symbol

PROFILE Description of soil profile
A & B — sample location

MC Moisture Content (%)

LL Liquid Limit (%)

PL Plastic Limit (%)

PI Plasticity Index (%)

LS Linear Shrinkage (%)

Dis Dispersivity — Emerson Class Number

Veloc Seismic refraction velocity (m/sec)

Rip Rippability
- R rippable
- M marginal
- B blasting

Const Construction materials
- CA Crushed aggregate
- RG Road gravel

G/W Groundwater occurrence

Slope Slope angle (degrees)

Erod Erodability
- L Low
- P Poor
- M Moderate
- E Expansive soils
- G Gully
- T Tunnel
- C Cliff/coastal
- S Sheet
- F Foreshore

Septic Septic tank suitability
- P Poor
- M Moderate
- L Low
- MG Marginal
- G Good

Stabil Stability of site
- S Stable
- M Marginal
- MD Moderate
- C Creep
- U Unstable

Drill Drill information

Comment general comments about site

XRD X-Ray Diffraction analysis (semi-quantitative)

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
1	17 Victoria Esplanade, Bellerive	529552522	2	Ps		CL	0–110 mm orange/brown sandy CLAY	
						CL	110–450 mm brown sandy CLAY	
						CH	450–760 mm brown CLAY	
2	Bellerive Battery, Gunning Street, Bellerive	529852520	2	Ps	0.48	OL	0–300 mm brown organic clayey SAND	
						SW	300–480 mm brown gravelly SAND	
							480 mm+ weathered SILTSTONE	
3	1 Beach Street, Bellerive	530852525	2	Qsa		ML	0–50 mm brown Organic SAND	
						SP	50–640 mm brown SAND	
						SC	640–820 mm grey SAND	
4	1 km before Mt Rumney summit, Cambridge	536052545	2	Jd	1.6	CL	0–200 mm brown silty CLAY	
						CH	200–400 mm brown CLAY	A
						CH	400–1600 mm brown gravelly CLAY	
							1600 mm+ DOLERITE bedrock	
6	Recreation Ground at rear of 124 Carella Street, Howrah	533652590	2	Ps		ML	0–300 mm brown SILT	
						CL	300–450 mm brown silty CLAY	
						CL	450–900 mm grey/brown CLAY	A
7	Southern end Droughty Point Road, Rokeby	535552575	2	Jd	1.5	CL	0–200 mm silty CLAY	
						CH	200–450 mm brown gravelly CLAY	
						CH	450–850 mm brown silty CLAY	A
9	Second Bluff, Wentworth Street, Howrah	531552520	2	Trs	1.5	OL	0–350 mm grey organic silty SAND	
						SP	350–760 mm brown SAND	
						CL	760–1000 mm orange/brown sandy CLAY	A
10	Corner Cambridge Road and Clarence Street, Bellerive	530052530	2	Trs	0.9	OH	0–450 mm grey organic silty CLAY	
						SP	450–600 mm brown SAND	
						CL	600–900 mm orange sandy CLAY	
13	Cambridge Rd opposite hotel, Cambridge	535052568	2	Jd	1	ML	0–300 mm brown clayey SILT	A
14	Mt Mather, Sandford	538552475	2	Ps	1	OL	0–100 mm grey/black organic SILT	
						CH	100–450 mm grey gravelly CLAY	A
15	Opposite HEC substation Droughty Point Road, Rokeby	535952497	2	Ts		OL	0–120 mm grey/black sandy SILT	
						CH	120–250 mm yellow/brown CLAY	A
						CH	250–550 mm yellow/brown sandy CLAY	
16	Opposite Police Academy, South Arm Road, Rokeby	537652493	2	Jd	1	CL	0–100 mm grey gravelly silty CLAY	
						CH	100–250 mm grey gravelly CLAY	A
						CH	250–450 mm orange/grey gravelly CLAY	
17	Rear of Rokeby Tavern, Rokeby	536652502	2	Ps	1.2	CL	0–100 mm grey organic sandy CLAY	
						CL	100–200 mm orange/brown gravelly CLAY	
						CL	200–500 mm brown gravel sandy CLAY	A
						CL	500–700 mm white/grey gravelly CLAY	
21	Corner Nankoor Cres. and Warren Crt, Howrah	531952534	2	Trs	1.5	SM	0–450 mm grey organic SILT	
						CL	450–900 mm+ yellow sandy CLAY	A
22	Junction Sports Ground and Bounty Street, Warrane	526852554	2	Trs	0.9	OL	0–100 mm black/brown organic SILT	
						CL	100–250 mm brown gravelly sandy CLAY	
						CH	250–900 mm orange/brown sandy CLAY	A
							900 mm+ weathered BEDROCK	
24	North end of Flagstaff Gully Reservoir, Flagstaff Gully	530752555	2	Ps	0.6	OL	0–100 mm brown organic clayey SILT	
						CH	100–600 mm orange/brown sandy CLAY	A
							600 mm+ weathered SILTSTONE	
25	16 Musgrove Road, Geilston Bay	528152568	2	Tb	1	OL	0–50 mm black organic clayey SILT	
						CH	50–270 mm orange/brown sandy CLAY	A

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
1							1600	R			3	S	P	S		
2							1600	R			11	TG	P	S		
3							450	R		1		L	P	S		
4							2300	M			15	L	P	S/M		
		46			20											
6							1700	R			8	TG	P	S		
		45	20	25	16											XRD A mont:90-95% kaolin:0-5%
7																
		52			14											
9							1100	R			4	CC	P	S		
		46	*		14											
10							1700	R			4	L	P	S		
13	21	38	16	22	15		2400	M			7	L	M	S		
14							1700	R			7	TGS	P/MG	S		
	27	54	*		14											XRD A mont:30-35% kaolin:60-65%
15							800	R				P		S		
	13	48	9	39	14											
16							1400	R			10	L	P	S/M		
	26	32	20	12	10											XRD A mont:90-95% kaolin:5-10%
17							1600	R			3	L	MG	S		
	14	31	10	21	14											XRD A mont:40-45% kaolin:55-60%
21							1700	R			15	TG	P	S		
	19	35	*		10											
22							1700	R			6	TG	MG/P	S		
	26	63	17	46	18											XRD A kaolin:85-90% gibbsite:10-15%
24							2100	M			6	TG	P	S		
	30	67	19	48	20											XRD A mont:60-65% kaolin:30-35% feldspar:trace
25							1900	R			2	L	P	S		
	27	69	20	49	20											XRD A mont:90-95% kaolin:5-10%

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
26	Bedlam Walls, Geilston Bay	527452570	2	Ps	0.35	ML	0–100 mm grey gravelly clayey SILT	
						CL	100–350 mm grey gravelly silty CLAY	A
							350 mm+ weathered SILTSTONE	
27	Church Point, Risdon	525952586	2	Jd	1	ML	0–100 mm grey/black clayey SILT	
						CH	100–500 mm brown sandy CLAY	A
28	HEC Substation, Sugarloaf Road, Risdon Vale	528352585	2	Ps	0.3	ML	0–150 mm brown gravelly clayey SILT	
						CL	150–300 mm grey gravelly silty CLAY	A
							300 mm+ weathered SILTSTONE	
29	Corner Murtons Road and East Derwent Highway, Woodville Bay	523652617	2	Trs	1	OH	0–100 mm black silty CLAY	
						CH	100–250 mm brown silty CLAY	A
						CH	250–380 mm brown CLAY	
						CH	380–580 mm white/brown sandy CLAY	B
30	East Derwent Highway above Woodville Bay, Otago Bay	523252654	2	Trs	1.5	OL	0–100 mm brown organic sandy SILT	
						CL	100–200 mm black silty CLAY	
						CH	200–800 mm brown CLAY	A
						CH	800–900 mm grey/brown gravelly CLAY	
31	East Derwent Highway, Otago Bay	524152608	2	Jd	1.5	CH	0–250 mm brown CLAY	A
						CH	250–750 mm brown CLAY	
						CH	750–900 mm yellow gravelly CLAY	B
32	Cleburne Point, Risdon Cove	525852594	2	Trs	1	GP	0–100 mm GRAVEL	
						CL	100–300 mm brown sandy CLAY	
						OL	300–600 mm black organic SILT	
						CH	600–700 mm brown sandy CLAY	A
33	Eastern end Bowen Bridge, Risdon Cove	525252596	2	Trs		OL	0–200 mm black organic sandy SILT	
						CH	200–400 mm brown sandy CLAY	
						CH	400–800 mm brown CLAY	A
						SC	800–900 mm yellow/brown clayey SAND	
37	Seven Mile Beach Road, Seven Mile Beach	540052540	2	Jd	1.5	OL	0–100 mm brown organic clayey SILT	
						CL-CH	100–300 mm black silty CLAY	
						CH	300–800 mm brown CLAY	A
38	Northeast of junction of Acton Road and Acton Drive.	538052504	2	Tb	1	OL	0–200 mm red/brown organic clay SILT	
						CH	200–500 mm red/brown sandy CLAY	
						CH	500–520 mm red/brown gravelly CLAY	
42	Corner Colebrook Road and Richmond Golf Club, Cambridge	536052587	2	Trs	0.7	CL	0–250 mm brown silty CLAY	
						CH	250–700 mm yellow/brown/green CLAY	A
						OL	700 mm+ SANDSTONE bedrock	
43	50 m east of corner Colebrook Road and Richmond Golf Club, Cambridge	536252589	2	Trs	1		0–300 mm grey organic SAND	
						CH	300–500 mm brown sandy CLAY	A
						SC	500–750 mm brown clayey SAND	
44	Corner Acton Road and Tasman Highway, Cambridge	537252525	2	Ts		ML	0–200 mm brown SILT	
						CH	200–600 mm grey/brown sandy CLAY	A
						SC	600–800 mm white/brown clayey SAND	
46	300 m east of Mines Div. Store, Mornington	533252544	2	Ps	1	ML	0–200 mm grey SILT	
						CL	200–300 mm orange/grey gravelly CLAY	
47	Mines Division Store, Mornington Road, Mornington	532952544	2	Trs		ML	0–250 mm grey rock flour SILT	
						CL	250–800 mm grey/brown sandy CLAY	A
						SC	800–1000 mm white/grey clayey SAND	
48	Half distance along Pass Road, Rokeby	534652530	2	Tb/Ps	2	OL	0–200 mm black organic sandy SILT	
						SC	200–450 mm grey clayey SAND	
						CH	450–900 mm orange/brown sandy CLAY	A
						SC	900–1100 mm grey/orange clayey SAND	

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
26							2300	M			4	SG	P	S		
	17	27	*		6											XRD A mont:15-20% kaolin:5-10% illite:65-70%
27							1600	R			4	L	M	S		
	23	68	15	53	20											XRD A mont:90-95% kaolin:5-10%
28							2300	M			4	SG	P	S		
29							1700	R			2	TG	P	S		
	22	66	12	54	20											
	25	63	15	48	17											XRD B mont:95-100% kaolin:trace
30							1100	R			3	TG	P	S		
	25	66	18	48	12											XRD A mont:30-35% kaolin:65-70%
31	35	75	20	55	28		1800	R			25	M	P	M		XRD A mont:95-100% kaolin:trace
	27	65	20	45	18											B mont:95-100% kaolin:trace
32							1100	R			6	TG	P	S		
	33	80	16	64	18											
33							1100	R			4	TG	P	S		
	31	75	17	58	15											XRD A mont:95-100% kaolin:trace
37							1500	R				L	P	S		
	32	90	22	68	20											XRD A mont:10-15% kaolin:10-15% illite:70-75%
38							1900	R			5	L	L	S		
	39	97	19	78	33											XRD A mont:60-65% kaolin:35-40%
42							1800	R			1	L	P	S		
	35	76	22	54	21											
43							1100	R			10	TG	P	S		
	22	54	12	42	11											XRD A mont:90-95% kaolin:0-5%
44A							800	R				P	P	S		
	16	56	10	46	12											XRD A mont:90-95% kaolin:5-10% lapidacrocite tr.
46							1700	R			15	STG	P/MG	S		
47							1200	R			5	TG	P	S		
	54	45	11	34	14											XRD A mont:60-65% kaolin:35-40%
48							1900	R			5	L	M	S		
	14	35	12	23	11											XRD A mont:60-65% kaolin:35-40%

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
49	18 Tollard Court, Rokeby	535052510	2	Tb	1	OH	0–120 mm black organic SILT	
						GC	120–200 mm red/brown clayey GRAVEL	
						CH	200–650 mm mottled brown CLAY	A
						GP	650–700 mm red/brown fine GRAVEL	
50	Reservoir northeast of Rokeby	534552511	2	Tb	1.5	MH	0–200 mm red/brown gravelly SILT	
						CH	200–750 mm brown sandy CLAY	A
						CH	750–900 mm brown gravelly CLAY	
51	Corner Tranmere Road and Rokeby Road, Howrah	533052523	2	Jd	1.5	OL	0–200 mm black organic sandy SILT	
						CH	200–750 mm brown sandy CLAY	A
						CH	750–820 mm brown gravelly CLAY	
52	Aintree, Pass Road, Mornington	534452539	2	Trs		OL	0–150 mm grey organic SILT	
						SP	150–200 mm white SAND	
						CH	200–1100 mm grey/orange CLAY	A
53	Corner Norma Street and Sirius Street, Howrah	532952531	2	Jd	1.5	OL	0–100 mm black organic clayey SILT	
						CH	100–200 mm brown/black CLAY	A
						CH	200–800 mm brown CLAY	B
						GC	800–900 mm brown clayey GRAVEL	
54	Corner Minerva Street and Corinth Street, Howrah	533652513	2	Jd	1.5	ML	0–200 mm red/brown SILT	
						CH-GC	200–650 mm red/brown gravelly CLAY	A
						GC	650–750 mm brown clayay GRAVEL	
62	Restdown Point, Otago Bay	523252610	2	Jd	1.5	CH	0–800 mm red/brown CLAY	A
						CH	800–1100 mm green/brown CLAY	B
63	Park off Golf Links Road, Lindisfarne	529052657	2	Trs		OL	0–150 mm brown organic silty SAND	
						CL	150–600 mm orange/brown sandy CLAY	A
64	Opposite 26 Rosny Esplanade, Montagu Bay	528852538	2	Jd	1.5	OL	0–250 mm black organic SILT	
						CH	250–700 mm red/brown gravelly CLAY	A
65	Opposite 80 Rosny Esplanade, Rosny Point	528652527	2	Jd	0.5	CH	0–300 mm red/brown silty CLAY	A
66	3 York Street, Bellerive	530352530	2	Trs	1.5	OL	0–350 mm black organic SILT	
						CL	350–990 mm brown sandy CLAY	A
						SC	990–1050 mm grey/brown clayey SAND	
67	South end Negara Crescent, Goodwood	523852588	2	Tb	1	GM	0–200 mm unconsolidated fill GRAVEL	
						CH	200–500 mm green brown CLAY	A
68	23 Negara Crescent, Goodwood	524252585	2	Tb	1	CH	0–400 mm brown sandy CLAY	A
69	662 Nelson Road, Mt Nelson	527552470	2	Jd	1	OL	0–250 mm brown organic clayey SILT	
						CH	250–600 mm orange/brown sandy CLAY	A
						GM	600–700 mm yellow sandy GRAVEL	
70	Corner Huon Highway and Summerleas Road, Kingston	523352427	2	Tb	1.5	MH-CH	0–250 mm clayey SILT/silty CLAY	A
						CH	250–800 mm red/brown sandy CLAY	B
72	North of Cades Spur, Huon Highway, Kingston	521252425	2	Tb	1	CH	0–150 mm brown silty CLAY	
						CH	150–600 mm brown gravelly CLAY	A
73	Berriedale Bowling Club, Berriedale	521052600	2	Trs	1.5	OL	0–300 mm grey organic sandy SILT	
						CH	300–450 mm grey/brown CLAY	A
						CH	450–700 mm brown CLAY	B
						CH	700–850 mm brown sandy CLAY	
74	6 Austins Ferry Road, Austins Ferry	520852635	2	Trs		OL	0–100 mm black organic silty LOAM	
						OH	100–250 mm black organic silty CLAY	
						CH	250–800 mm brown sandy CLAY	A
75	North end of Goulds Lagoon, Hestercombe Road, Austins Ferry	519452654	2	Jd	1.5	OH	0–100 mm black organic SILT	
						CH	100–800 mm black CLAY	A

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
49							1900	R			4	L	M	S		
	36	101	20	81												XRD A mont:80-85% kaolin:35-40%
50							1900	R			5	L	P	S		
	30	115	20	95	20											XRD A mont:55-60% kaolin:40-45%
51							1500	R			3	L	P	S		
	20	64	13	51	18											XRD A mont:85-90% kaolin:10-15%
52							1100	R			5	L	P	S		
		88	20	68	25											
53							1800	R			22	L	P	MD		
	30	75	20	55	27											XRD A mont:90-95% kaolin:5-10%
	23	110	20	90	20											B mont:90-95% kaolin 5-10%
54							1400	R			18	L	M	S		
	17	52	14	38	17											XRD A mont:85-90% kaolin:10-15%
62	38	123	17	106	20		1600	R			4	L	P	S		XRD A mont:95-100% kaolin:0-5%
	24	96	30	66	19											
63							1700	R			2	TG	P	S		
		49	*													XRD A mont:95-100%
64							1800	R			4	L	MG	S		
	23	108	21	87	28											XRD A mont:75-80% kaolin:20-25%
65	35	64	20	44	19		2400	M			5	L	P	S		
66							1700	R			1	L	P	S		
	18	50	14	36	9											XRD A mont:5-10% kaolin:85-90% illite:trace
67							1800	R				L	P	S		
	32	89	17	72	15											XRD A mont:60-65% kaolin:35-40%
68	20	82	18	64	18		1900	R			1	L	P	S		XRD A mont:90-95% kaolin:0-5% illite:0-5%
69							2400	M			15	L	MG	S/M		
	31	76	14	62	21											XRD A mont:50-55% kaolin:45-50%
70	34	140	34	106	20		1800	R			3	L	M	S		XRD A mont:90-95% kaolin:5-10%
	49	104	24	80	25											B mont:95-100% kaolin:trace
72							1900	R			12	L	P	M/U		
	18	67	18	49	17											XRD A mont:95-100% kaolin:0-5%
73							1700	R			1	L	P	S		
	23	76	27	49	20											XRD A mont:trace kaolin:5-10% illite:75-80%
	25	63	26	37	10											B mont:trace kaolin:0-5% illite:90-95%
74							1600	R			1	L	P	S		
	20	78	12	66	20											XRD A mont:70-75% kaolin:5-10% illite:15-20%
75							2000	M			2	L	P	S		
	33	113	29	84	28											XRD A mont:99-100% kaolin:trace

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
76	1.5 km up Black Snake Lane, Granton	518252655	2	Trs		OH	0–250 mm black organic silty CLAY	A
						CH	250–550 mm brown sandy CLAY	
78	Opposite 30 Nubeena Crescent, Taroona	528752445	2	Ts		OL	0–100 mm black silty CLAY	
						CH	100–600 mm black CLAY	A
						CH	600–900 mm white/brown sandy CLAY	B
79	31 Lynden Road, Bonnet Hill, Taroona	526552428	2	Jd	1	OL	0–100 mm brown organic SILT	
						CH	100–400 mm brown gravelly CLAY	A
						GC	400–450 mm brown/white clayey GRAVEL	
80	Junction Channel Highway and Lynden Road, Bonnet Hill	526852430	2	Trs		SM	0–300 mm grey silty SAND	
						CL	300–600 mm brown silty CLAY	A
81	Corner Maddocks Road and Channel Highway, Kingston	523052395	2	Tb	1.5	ML-CL	0–200 mm brown sandy SILT/sandy CLAY	
						CH	200–450 mm red/brown gravelly CLAY	
						CH	450–750 mm brown CLAY	A
85	Under power lines west of Strickland Avenue, Marlyn Road, Cascades	522152500	2	Ps	1	OL	0–150 mm grey organic silty SAND	
						CL	150–850 mm orange/brown sandy CLAY	A
						CH	850–1000 mm brown orange CLAY	B
							1000 mm+ weathered SILTSTONE	
87	Opposite 91 Summerleas Road, Ferntree	521552475	2	Ps		CH	0–500 mm brown CLAY	A
						GC	500–600 mm brown clayey GRAVEL	
88	Ferntree end of Summerleas Road, Ferntree	522052465	2	Jd	1	CH	0–300 mm black/brown CLAY	A
						GC/CH	300–600 mm brown clayey GRAVEL/CLAY	
89	Youth Camp, Scotts Road, Summerleas	521852448	2	Ps	0.9	OL	0–300 mm grey/white organic SILT	
						CL	300–600 mm orange/grey sandy CLAY	
						CH	600–900 mm white/grey CLAY	
							900 mm+ weathered SILTSTONE	
90	153 Waterworks Road, Dynnyrne	524652496	2	Trs		OH	0–500 mm black/brown organic CLAY	
						CH	500–1000 mm green/brown sandy CLAY	A
91	Corner Tagg Street and Hall Street, Ridgeway	523252470	2	Jd	1.5	CH	0–350 mm grey/orange silty CLAY	
						CH	350–1000 mm orange sandy CLAY	A
92	Upper Reservoir, Waterworks Road, Dynnyrne	523452485	2	Trs		SC	0–1000 mm grey clayey SAND	
93	3 Ballard Street, Glenorchy	521752567	2	Qs		MH	0–300 mm black/grey clayey SILT	
						CH	300–750 mm brown CLAY	A
						CH	750–1100 mm orange sandy CLAY	B
94	Opposite 188 Chapel Street, Glenorchy	520852562	2	Ps		OH	0–200 mm grey/brown organic SILT	
						CL	200–400 mm red/brown sandy CLAY	A
						GC	400–900 mm brown clayey GRAVEL	
95	Corner Albert Rd and Brooker Ave, Moonah	525352558	2	Ts		CH	0–350 mm black/brown CLAY	A
						CH	350–750 mm brown/green CLAY	B
96	East of Risdon Golf Links, Risdon Road, Lutana	525752567	2	Trs		OL	0–200 mm black organic SILT	
						CH	200–450 mm black CLAY	A
						GC	450–700 mm brown clayey GRAVEL	
						MH	700–950 mm black SILT	
97	100 Lennox Avenue, Lutana	525252572	2	Jd	1.5	OL	0–200 mm black organic clayey SILT	
						CH	200–700 mm brown CLAY	A
						CH	700–750 mm orange/brown CLAY	B
98	Top Giblin Street, Mt Stuart	523852532	2	Jd	0.65	CH	0–550 mm brown CLAY	A
						CH	550–650 mm yellow/brown gravelly CLAY	
							650 mm+ DOLERITE bedrock	

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
76	34	98	24	74	20		1400	R			2	TG	P	S		XRD A mont:90-95% kaolin:5-10%
78							1400	R			3	L	P	S		
	35	71	25	46	22											XRD A mont:90-95% kaolin:0-5%
	40	82	37	45	21											B mont:90-95% kaolin:0-5%
79							2200	M			10	L	MG	S		
	19	80	31	49	22											XRD A mont:70-75% kaolin:15-20% feldspar:trace
80							1700	R			6	TG	P	S		
	19	62	23	39	18											
81							1900	R			2	L	P	S		
	29	86	21	65	14											XRD A mont:99-100%
85							1700	R			5	SG	P	S		
	18	38	33	5	10											XRD A mont:15-20% kaolin:75-80% illite:0-5%
	31	72	20	52	17											B mont:5-10% kaolin:80-85% illite:5-10%
87	43	98	24	74	25		1700	R			2	TG	P	S		XRD A mont:65-70% kaolin:30-35%
88	33	66	25	41	20		2200	M			4	L	P	S		XRD A mont:35-40% kaolin 55-60%
89	37	90	33	57	21		1700	R			5	TGS	MG	S		XRD A mont:0-5% kaolin:75-80% illite:15-20%
90							1200	R			23	TG	P	M/U		
	35	91	27	64	20											XRD A mont:85-90% kaolin:10-15%
91							1800	R				L	P	S		
	40	96	22	74	15											XRD A mont:65-70% kaolin:30-35%
92	23	63	15	48	12		1700	R			10	TG	P	S		XRD A mont:90-95% kaolin:0-5%
93							500	R				P	P	S		
	20	49	18	31	15											XRD A mont:50-55% kaolin:45-50%
	25	40	22	18	10											B mont:70-75% kaolin:15-20% illite:5-10%
94							1200	R			1	P	M	S		
	26	52	18	34	17											XRD A mont:50-55% kaolin:45-50%
95		80	24	56	26		2000	R			3	L	P	S		XRD A mont:80-85% kaolin 15-20%
	27	87	14	73	22											B mont:80-85% kaolin 15-20%
96							1500	R			4	TG	P	S		
	27	78	23	55	21											XRD A mont:95-100% kaolin:0-5%
97							2200	R			6	E	P	S/M		
	32	99	25	74	21											XRD A mont:90-95% kaolin:5-10%
	29	85	14	71	23											B mont:95-100% kaolin 0-5%
98	41	96	27	69	23		2400	M			28	L	P	M		XRD A mont:90-95% kaolin:5-10%
	27	70	17	53	18											B mont:85-90% kaolin:10-15%

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
99	End Gregson Avenue, New Town	524052546	2	Trs		OL	0–150 mm black organic sandy SILT	
						MH	150–300 mm brown clayey SILT	
						CH	300–800 mm yellow/brown CLAY	A
100	St Johns Avenue, New Town	524352552	2	Jd	1.5	OL	0–150 mm black organic SILT	
						CH	150–300 mm brown silty CLAY	
						SC	300–450 mm grey clayey SAND	
						CH	450–1000 mm orange/brown CLAY	A
101	3 Sinclair Street, New Town	523952554	2	Jd	1.5	CL	0–150 mm grey/brown silty CLAY	
						CH	150–600 mm green/brown CLAY	A
102	400 m northwest of junction, Collinsvale Road and Molesworth Road, Glenlusk	516352580	2	Ps	1	ML	0–400 mm brown gravelly SILT	
						CL	400–500 mm white/grey CLAY	
108	191 Davey Street, Hobart	526152509	2	Ts		OL	0–350 mm black organic sandy SILT	
						CH	350–1050 mm brown gravelly CLAY	A
109	10 Milles Street, Dynnyrne	515052580	2	Jd	1.5	OL	0–400 mm black/brown organic SAND	
						CH	400–800 mm brown gravelly CLAY	A
110	13 Hillborough Road, Cascades	524052504	2	Trs		SP	0–300 mm grey/brown SAND	
						CH	300–700 mm orange/brown CLAY	A
						SC	700 mm+ orange/brown clayey SAND	
111	North end of Waterworks Road, Dynnyrne	525652500	2	Jd	1	CH	0–200 mm black CLAY	A
						CH	200–400 mm brown gravelly CLAY	B
112	111 King Street, Sandy Bay	526152505	2	Ts		OL	0–300 mm black organic silty CLAY	
						CH	300–700 mm brown/green CLAY	A
						SC	700–800 mm brown clayey SAND	
113	University, Churchill Avenue, Sandy Bay	526552495	2	Jd/Ts		CH	0–300 mm black CLAY	
						CH	300–550 mm brown/green CLAY	A
						CH	550–1350 mm brown CLAY	B
						SC	1350 mm+ brown clayey SAND	
114	26 Red Chapel Avenue, Sandy Bay	527852487	2	Ts		CH	0–100 mm black silty CLAY	
						CH	100–550 mm sandy CLAY	A
115	36 Clutha Place, South Hobart	524052499	2	Trs	0.55	OL	0–100 mm grey organic SILT	
						CL	100–550 mm yellow/brown sandy CLAY	A
							550 mm+ SANDSTONE bedrock	
116	HCC Council Depot, Huon Road, Cascades	523252496	2	Trs		OL	0–300 mm grey organic SILT	
						CH	300–400 mm yellow/brown CLAY	A
117	End Tara Street, South Hobart	524552509	2	Trs		SM	0–150 mm grey/brown sandy SILT	
						CH	150–700 mm yellow/brown CLAY	A
						CH	700 mm+ brown CLAY	
118	Opposite 130 Forest Road, South Hobart	525052512	2	Trs	1.5	OL	0–50 mm grey sandy LOAM	
						SC	50–1000 mm yellow/orange clayey SAND	
119	Opposite 14 Clift Street, Mt Stuart	524352527	2	Trs		CH	0–400 mm grey/brown sandy CLAY	A
						CH	400–850 mm white/orange CLAY	B
120	35 Ogilvie Street, Mt Stuart	524052534	2	Jd	1	CL	0–150 mm black silty CLAY	
						CH	120–400 mm brown CLAY	A
						CH	400–1000 mm orange/brown sandy CLAY	B
							1000 mm+ DOLERITE bedrock	
121	400 Liverpool Street, South Hobart	525652512	2	Jd	1	MH	0–200 mm black clayey SILT	
						CH	200–500 mm yellow/brown CLAY	A
						CH-GC	500–550 mm gravel CLAY/clayey GRAVEL	

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
99							1100	R			15	TG	P	S/M		
	29	72	23	49	15											XRD A mont:95-100%
100							1800	R			3		MG	S		
	17	55	14	41	16											XRD A mont:75-80% kaolin:20-25%
101							1400	R			8		P	S		
	47	114	30	84	28											XRD A mont:85-90% kaolin:10-15%
102	19	42	32	10	6		1700	R			7	TG	P/MG	S/M		
108							1400	R			2	L	P	S		
	31	82	25	57	22											XRD A mont:90-95% kaolin:5-10%
109							2400	R			28	G	P	M		
	21	69	34	35	21											XRD A mont:70-75% kaolin:25-30%
110							1200	R			4	TG	P	S		
	26	80	22	58	17											XRD A mont:50-55% kaolin:15-20% illite:20-25%
111	21	65	22	43	22		1600	R			5		P	S		XRD B mont:75-80% kaolin:20-25%
	21	75	22	53	21											
112							1600	R			2	L	P	S		
	18	64	15	49	17											XRD A mont:95-100% kaolin trace
113							1500	R			10		P	M		
	34	99	26	73	16											XRD A mont:95-100% kaolin:trace
	36	99	22	77	17											B mont:95-100% kaolin 0-5%
114							1800	R			15	L	P	S/M		
	25	57	20	37	15											XRD A mont:95-100% kaolin:0-5%
115							2000	M			8	TG	P	S		
	25	43	26	17	11											XRD A mont:85-90% kaolin:5-10% illite:trace
116							1700	R			8	TG	P	S		
	23	66	29	37	13											XRD A mont:30-35% kaolin:trace illite:65-70%
117							2000	M			25	TG	P	M/U		
	22	62	26	36	17											XRD A mont:25-30% kaolin:55-60% illite:15-20%
118							1800	R			8	SG	P	S		XRD A mont:40-45% kaolin:40-45% illite:20-25%
	19	51	25	26	14											
119	22	51	22	29	7		2000	M			35	TG	P	M/U		XRD A mont:95-100% kaolin:trace
	28	57	15	42	11											B mont:90-95% kaolin:5-10%
120							2400	M			9	L	P	S		
	30	80	30	50	21											XRD A mont:95-100% kaolin:trace
	32	59	28	31	13											B mont:95-100% kaolin:trace
121							1900	R			18			M		
		83	23	60	16											

No.	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
122	356 Murray Street, North Hobart	525652526	2	Jd/Trs		OL	0–200 mm brown organic clayey SILT	
						CH	200–700 mm brown CLAY	A
						CH	700–1150 mm red/orange sandy CLAY	B
123	Northern end of Knocklofty Terrace, West Hobart	524852524	2	Trs	1	SC	0–200 mm brown clayey SAND	
						GC	200–1000 mm brown clayey GRAVEL	A
							1000 mm+ weathered SANDSTONE	
124	59 Arthur Street, North Hobart	525352526	2	Jd		CL	0–600 mm yellow/brown sandy CLAY	
						SC	600–1800 mm brown clayey SAND	A
125	11 Church Street, North Hobart	526252526	2	Trs	1	OL	0–100 mm brown/black organic SILT	
						CH	100–800 mm red/brown sandy CLAY	
126	5 Kendrick Court, Dynnyrne	525652501	2	Ts		OL	0–120 mm black organic clayey SILT	
						CH	120–300 mm black/brown silty CLAY	A
						CH	300–600 mm green/brown silty CLAY	B
						CH	600–700 mm yellow/brown sandy CLAY	
127	10 Maxwell Street, West Moonah	523652565	2	Ts		SM	0–120 mm grey/black organic SAND	
						CH	120–720 mm brown sandy CLAY	A
						CH	720–1000 mm brown CLAY	
128	160 Main Road, Moonah	522852572	2	Ts		OL	0–800 mm black organic silty CLAY	A
						GW	800–1200 mm grown well graded GRAVEL	
						CH	1200–1800 mm green/black CLAY	B
						CH	1800–2500 mm brown CLAY	
129	Elwick Racecourse, Goodwood	523052584	2	Tb	1.5	CH	0–500 mm brown CLAY	A
130	12 Third Avenue, Springfield	523252566	2	Jd	1.5	CL	0–100 mm black/brown sandy CLAY	
						CH	100–650 mm black CLAY	A
						CH	650–850 mm white/brown CLAY	B
131	West end of Bently Road, Lenah Valley	522052555	2	Jd	1	CL	0–100 mm brown black silty CLAY	
						CH	100–700 mm brown CLAY	A
						CH-GC	700–750 mm brown gravelly CLAY/GRAVEL	
132	11 Knoll Street, Glenorchy	523152576	2	Ts		SM	0–500 mm grey silty SAND	
						CH	500–950 mm grey sandy CLAY	A
133	North of junction Box Hill Road and Lamond Drive, Claremont	519652615	2	Trs	1.5	SM	0–300 mm grey/brown silty SAND	
						SC-CH	300–600 mm clayey SAND/sandy CLAY	A
134	Junction Abbotsfield Road and Russell Road, Claremont	518152623	2	Ps	1	ML	0–500 mm grey SILT	
						CH	500–1000 mm orange/grey CLAY	A
							1000 mm+ weathered SILTSTONE	
135	84 Abbotsfield Road, Claremont	519652624	2	Trs	1	CL	0–250 mm brown silty CLAY	
						CL	250–600 mm grey/brown CLAY	A
136	Junction Gillies Road and Hilton Road, Austins Ferry	519152640	2	Jd		CH	0–700 mm black CLAY	A
						CH	700–1000 mm brown CLAY	B
139	Wakehurst Road Council Gate at Poimena Reserve, Austins Ferry	520252633	2	Jd	1.5	CL	0–150 mm black silty CLAY	
						CH	150<900 mm black CLAY	A
140	Retirement Village, Cadbury Point, Claremont	521252627	2	Tb	0.65	CL	0–300 mm brown gravelly silty CLAY	A
						CH	300–650 mm brown CLAY	B
							650 mm+ BASALT bedrock	
141	Retirement Village, Cadbury Point, Claremont	521352625	2	Tb	2	CH	0–600 mm grey sandy CLAY	A
						GP	600–1200 mm brown coarse GRAVEL	
						CH	1200–1800 mm grey silty CLAY	B
142	31 Falcon Street, Chigwell	521152612	2	Trs		CL	0–650 mm orange/grey sandy CLAY	

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
122							1800	R			7	L	P	S		
		45	23	22	16											
		58	22	36	17											XRD B mont:45-50% kaolin:30-35% illite:15-20%
123							1600	R			8	STG	P	S		
		51	26	25	13											XRD A mont:trace kaolin:20-25% illite:70-80%
124							1900	R			5	L	MG	S		
		88	42	46	13											XRD A mont:95-100% kaolin:0-5%
125		94	30	64	26		1700	R			2	L	P	S		
126							1800	R			7	L	P	S		
		117	30	87	22											XRD A mont:85-90% kaolin:10-15%
	37	111	32	79	19											B mont:80-85% kaolin:15-20%
127							1700	R				L	P	S		
	26	97	17	80	15											XRD A mont:65-70% kaolin:30-35%
128	16	59	18	41	11		1800	R			4	L	P	S		XRD A mont:95-100% kaolin:0-5%
	37	82	19	63	17											B mont:95-100% kaolin:0-5%
129	20	77	19	58	16		1900	R			2	L	M	S		XRD A mont:90-95% kaolin:5-10%
130							1800	R			2	L	MG	S		
	39	97	27	70	28											XRD A mont:95-100% kaolin:0-5%
	44	100	34	66	20											B mont:100%
131							2400	M			7	L	P	S		
	21	57	25	32	19											XRD A mont:95-100% kaolin:0-5%
132							1500	R			1	L	M	S		
	31	86	25	61	23											XRD A mont:85-90% kaolin:5-10% illite:0-5%
133							1700	R			7	TG	P	S		
	17	60	19	41	14											
134							1700	R			7	TG	P	S		
	21	97	20	77	25											
135							1700	R			2	TG	P	S		
	14	43	17	26	17											
136	35	111	29	82	27		1900	R			2	L	P	S		XRD A mont:100%
	35	104	22	82	23											B mont:95-100% kaolin:0-5%
139							1900	R			12	L	P	S		
	40	105	29	76	23											XRD A mont:85-90% kaolin:10-15%
140	23	56	15	41	14		2200	M			12	L	P	S/M		XRD A mont:95-100% kaolin:0-5%
	47	110	38	72	24											B mont:85-90% kaolin:10-15%
141	14	78	19	59	19		1900	R			5	L	M	S		XRD A mont:50-55% kaolin:45-50%
	19	114	24	90	20											B mont:60-65% kaolin:35-40%
142	12	33	25	8	10		1700	R			4	L	P	S		XRD A mont:0-5% kaolin:70-75% illite:20-25%

No.	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
143	Ambulance Station, Claremont	520752619	2	Jd	1.5	OL	0–400 mm brown organic SILT	
						CH	400–700 mm brown CLAY	A
							700–900 mm brown sandy CLAY	
144	Corner Allunga Road and Claremont Link Road, Claremont	520052608	2	Trs		OL	0–100 mm brown organic silty LOAM	
						CH	100–650 mm brown silty CLAY	A
						CH	650–700 mm orange/grey sandy CLAY	B
145	Corner Berriedale Road and Catherine Street, Berriedale	520452595	2	Trs		OL	0–400 mm brown organic sandy SILT	
						CH	400–800 mm brown CLAY	A
146	13 Lowestoft Street, Connewarre Bay, Chigwell	520652607	2	Trs	1.5	SM	0–450 mm grey silty SAND	
						CH	450–1050 mm orange/brown CLAY	
147	300m west of junction Berriedale Road and Anne Street, Berriedale	519252596	2	Jd		CH	0–700 mm black silty CLAY	
						CH	700–750 mm black gravelly CLAY	A
148	Opposite 3 Taree Street, Berriedale	519952596	2	Trs	1.5	OL	0–100 mm grey organic silty LOAM	
						SM	100–400 mm brown silty SAND	
						CH	400–900 mm grey CLAY	A
						CH	900–1000 mm grey sandy CLAY	
149	Opposite 27 Radcliffe Crescent, Rosetta	520752590	2	Jd		CL	0–450 mm brown silty CLAY	A
						CH	450–550 mm brown gravelly CLAY	B
150	Northern Outlet, midway between Granton and Claremont	519052641	2	Jd		CH	0–400 mm black/brown CLAY	A
						CH	400 mm+ brown gravelly CLAY	B
151	Box Hill Overpass, Northern Outlet, Chigwell	520152618	2	Trs		CL	0–400 mm brown silty CLAY	
						CH	400–2200 mm grey CLAY	A
						CH	2200–3500 mm orange/brown silt CLAY	B
						CH	3500–8000 mm grey silty CLAY	
152	142 Marys Hope Road, Berriedale	520052590	2	Trs/Jd	0.8	OL	0–200 mm grey organic sandy LOAM	
						CH	200–700 mm brown sandy CLAY	A
							700 mm+ highly weathered DOLERITE	
153	SW end of Montrose Road, Glenorchy	519552570	2	Jd	1.5	CH	0–500 mm green/brown CLAY	A
						CH	500–750 mm brown CLAY	B
154	59 Brent Street, Glenorchy	521252571	2	Ps		ML-CL	0–500 mm brown sandy SILT/sandy CLAY	
155	North end Liverpool Street, Hobart	526852524	2	Trs	1.5	CH	0–600 mm brown sandy CLAY	A
						SP	600–1500 mm white SAND	
							1500 mm+ highly weathered SANDSTONE	
156	Corner Bathurst Street and Argyle Street, Hobart	526752522	2	Trs	3.5	CL	0–1200 mm red/grey CLAY	
						CH	1200–2200 mm grey CLAY	A
						CH	2200–3500 mm orange/white CLAY	B
163	Oil Depot, Selfs Point Road, New Town	526552555	2	Tb	1.5	OL	0–500 mm black organic SILT	
						CH	500–950 mm black gravelly CLAY	A
						CH	950–1050 mm black/brown CLAY	B
164	Corner Amy Street and Dawkins Court, West Moonah	523452554	2	Jd	1.2	OL	0–150 mm black organic SILT	
						CH	150–850 mm black/brown CLAY	A
						CH	850–1150 mm brown sandy CLAY	B
							1150 mm+ DOLERITE bedrock	
165	Opposite 79 Central Avenue, West Moonah	524652566	2	Tb	1.5	CH	0–150 mm black silty sandy CLAY	
						CH	150–800 mm black CLAY	A
166	Opposite Clare Street Oval, Harding Street, New Town	524652542	2	Trs		OH	0–200 mm black organic silty CLAY	
						CH	200–900 mm brown CLAY	A
167	South of Mines Division, Rosny Park	530452537	3	Jd		CH	0–650 mm brown/black CLAY	A
168	Adjacent to Balamara Road, Mornington	530852540	3	Jd		CL	0–350 mm brown sandy CLAY	A
						CH	350–450 mm brown CLAY	B

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
143							1800	R			6	L	MG	S		
	21	79	20	59	25											XRD A mont:95-100% kaolin:trace illite:trace
144							1700	R			5	TG	P	S		
	21	83	22	61	15											XRD A mont:99-100%
	23	80	26	54	23											B mont:99-100%
145							1100	R			2	L	P	S		
	14	60	15	45	19											XRD A mont:90-95% kaolin 5-10%
146	22	75	27	48	22		1700	R			5	TG	P	S		
147							1900	R			4	L	P	S		
	26	102	27	75	26											XRD A mont:85-90% kaolin:10-15%
148							1700	R			12	TG	P	S		
	20	55	26	29	20											XRD A mont:0-5% kaolin:80-85% illite:15-20%
149	29	78	23	55	22		1900	R			3	L	P	S		XRD A mont:95-100% kaolin:0-5%
	21	75	27	48	22											B mont:95-100% kaolin:0-5%
150	33	77	22	55	23		1900	R			10	G	P	M		XRD A mont:99-100% kaolin:trace
	14	47	18	29	16											B mont:80-85% kaolin:15-20%
151							1700	R			6	TG	P	S		
	21	65	23	42	16											XRD A mont:45-50% kaolin:35-40% illite:5-10%
	18	57	21	36	15											B mont:55-60% kaolin:25-30% illite:10-15%
152							1500	R			9	TG	P	S		
	25	77	23	54	16											XRD A mont:75-80% kaolin:20-25%
153	41	99	22	77	26		1900	R			8		P	M		XRD A mont:90-95% kaolin:5-10%
	40	115	25	90	22											B mont:90-95% kaolin:5-10%
154	12	40	23	17	13		1700	R			8	G	P/MG	S		XRD A mont:40-45% kaolin:35-40% illite:15-20%
155	10	50	16	34	12		1700	R			2	L	P	S		XRD A mont:80-85% kaolin:15-20% illite:0-5%
156							1700	R			3	L	P	S		
	13	53	15	38	16											XRD A mont:55-60% kaolin:40-45%
	41	80	29	51	21											B mont:30-35% kaolin:65-70%
163							1900	R			4	L	P	S		
	26	90	22	68	23											XRD A mont:95-100% kaolin 0-5%
	29	74	23	51	21											B mont:99-100%
164							2400	M			8	L	P	S		
	38	112	49	63	16											XRD A mont:99-100%
	38	100	0	100	23											B mont:95-100% kaolin:0-5%
165							1900	R			2	L	P	S		
	23	92	26	66	24											XRD A mont:95-100%
166							1100	R			5	L	P	S		
	16	92	24	68	23											XRD A mont:99-100%
167		85	*		22		2200	M			2	L	P	S		XRD A mont:moderate
168		43	*		8		1800	R			16	L	P	M		XRD A mont:weak felds:v.weak
		86	*		22											B mont:moderate felds:v.weak

No.	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
169	Adjacent to 23 Minerva Street, Howrah	533252514	3	Jd			0–300 mm	A
							300–600 mm	B
170	Oceana Drive, Howrah	533452512	3	Jd	1.2		0–100 mm	
							100–550 mm	A
							550–1200 mm	B
172	Quarry, Rosny Hill Lookout Road, Rosny	529452536	3	Jd			0–550 mm	
173	Botanical Gardens car park, Domain	526752536	3	Jd			0–350 mm	A
174	Top of Domain, Hobart	525952541	1	Jd			0–250 mm	A
177	Junction Napoleon Street and Sloane Street, Battery Point	527252507	3	Jd			0–100 mm	
							100–700 mm	A
							700–1900 mm	B
178	170 Brisbane Street, West Hobart	526052517	3	Jd			0–200 mm	
							200–650 mm	A
							650 mm+	
179	308 Huon Road, South Hobart	525152501	3	Jd	0.55	CH	0–250 mm black sandy CLAY	A
						CH	250–550 mm brown sandy CLAY	
							550 mm+ weathered DOLERITE	
180	Opposite 355 Nelson Road, Mount Nelson	526252482	3	Jd			0–250 mm	A
							250–550 mm	B
181	Corner Topham Street and Riawena Road, Rose Bay	528652543	3	Jd			0–50 mm	
							50–150 mm	A
							150–350 mm	
							350–650 mm	B
182	Corner Warwick Street and Watkins Street, West Hobart	528552520	3	Jd			0–100 mm	
							100–650 mm	A
183	Sunvale Avenue, Sandy Bay	527552484	3	Jd			0–300 mm	A
							300–850 mm	B
184	Corner Churchill Avenue and Lipscombe Avenue, Lower Sandy Bay	527852485	3	Jd			0–250 mm	
185	Junction Channel Highway and Baringa Road, Taroona	527752444	3	Jd			0–500 mm	
186	50 m west of Tyndall Road Channel Highway, Bonnet Hill	526452422	3	Jd			0–100 mm	
							100–500 mm	A
							500–750 mm	B
187	Corner Channel Highway and Stewart Crescent, Taroona	528752463	3	Jd			0–300 mm	A
							300–500 mm	B
189	295 Redwood Road, Blackmans Bay	524852393	3	Trs	0.35	SM	0–150 mm black silty SAND	
						SP	150–250 mm grey SAND	
						CL	250–350 mm orange/brown sandy CLAY	A
							350 mm+ weathered SANDSTONE	
190	200 m southeast of junction, Summerleas Road and Southern Outlet, Kingston	523652427	3	Trs	1.15	SP	0–450 mm orange silty SAND	A
						CH	450–700 mm brown sandy CLAY	
						CH	700–1150 mm brown sandy CLAY	B
							1150 mm+weathered SANDSTONE	
191	Antarctic Division, Channel Highway, Kingston	526352460	3	Trs	0.7	CH	0–200 mm yellow/grey sandy CLAY	
						SC	200–350 mm grey clayey SAND	A
						CH	350–700 mm yellow/brown sandy CLAY	B
							700 mm+ highly weathered SANDSTONE	
192	Jerim Place, Kingston	526352460	3	Ps		SM	0–200 mm grey silty SAND	
						CH	200–600 mm yellow/grey sandy CLAY	A

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
169		38	*		6						9	L	P	S		XRD B mont:moderate felds:weak
		45	*													
170							2400	M			12	L	P	S		
		57	*													XRD A mont:strong felds:v.weak
		40	*		18											B mont:strong felds:weak
172		84	*		24	2	2400	M	RG		5	L	P	S		XRD A mont:moderate felds:weak
173		102	*		25	0	2000	R			17	L	P	M		XRD A mont:moderate
174		109	*		26	0	2000	R			5	L	P	S		XRD A mont:moderate
177							2000	R			6	L	P	S		
		76	*		20	0										XRD A mont:strong
		120	*		25	3										B mont:ex.strong
178							2000	R			7	L	P	S		
		86	*		20	0										XRD A mont:strong
		106	*		24											
179		71	*		19	0	2000	R			17	L	P	S/M		XRD A mont:moderate
180		34	*		0		2000	R			4	L	P	S		XRD B mont:v.strong felds:weak
		65	*		18	1										
181							2000	R			3	L	P	S		
		59	*		19	0.5										XRD A mont:weak
		73	*		22	1										B mont:strong
182							2000	R			13	L	P	S		
		119	*		28	0										XRD A mont:ex.strong
183		83	*		21		2000	R			19	L	P	M		XRD A mont:strong
		88	*		23	0										B mont:v.strong
184		74	*		21	0	2000	R			12	L	P	S		XRD A mont:moderate
185		81	*		22	0	2000	R			16	G	P	M		XRD A mont:moderate
186							2000	R			9	L	P	S		
		73	*		20	0										XRD A mont:strong
		66	*		18	1										B mont:v.strong
187		65	*		19	0	2000	R			7	L	P	S		XRD A mont:v.strong felds:weak
		47	*		16											
189							1200	R			4	TG	MG	S		
		47	*		11	1										XRD A mont:v.weak kaolin:moderate
190		25	*		3	3	1300	R			6	TG	MG	S		
		65	*		15	3										XRD B mont:ex.strong kaolin:v.weak felds:weak
191							1300	R	RG		18	TG	P	S		
		28	*		3	0										
		70	*		18	0										XRD B mont:ex.strong
192							1500	R			7	TS	P	S		
		58	*		15											XRD A mont:weak kaolin:weak

No.	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
193	9 Miramar Park, Kingston Heights	526452397	3	Ps	1	SM	0–200 mm grey sandy SILT	
						SM	200–500 mm yellow/grey sandy SILT	A
						CH	500–800 mm yellow/grey silty CLAY	B
194	400 m west of Tasman Highway and Acton Road, Cambridge	536552569	3	Tb		CL	0–150 mm grey/brown silty CLAY	
						CH	150–550 mm brown sandy CLAY	A
195	Junction Southern Outlet and Summerleas Road, Kingston	523352426	3	Tb	1	CL	0–100 mm brown silty CLAY	
						CH	100–450 mm red/brown CLAY	A
196	Browns Road Bridge, Southern Outlet, Kingston	525252426	3	Tb	0.5	ML	0–200 mm grey/brown clayey SILT	
						CH	200–500 mm yellow/brown sandy CLAY	A
							500 mm+ extremely weathered BASALT	
197	Northwest of Southern Outlet/Channel Highway junction, Firthside	524552427	3	Ps	0.4	ML	0–150 mm grey clayey SILT	A
						CH	150–400 mm grey silty CLAY	B
							400 mm+ highly weathered SILTSTONE	
198	Junction Southern Outlet and Mount Nelson Road, Mount Nelson	525152483	3	Ps	0.5	CL	0–150 mm grey sandy silty CLAY	
						CH	150–500 mm yellow/brown sandy CLAY	A
							500 mm+ highly weathered SILTSTONE	
199	Wellesley Park, South Hobart	524252501	3	Trs	0.85	SP	0–150 mm yellow/grey SAND	
						CH	150–350 mm yellow/grey sandy CLAY	A
						CH	350–850 mm yellow/grey CLAY	B
							850 mm+ slightly weathered SANDSTONE	
200	Opposite 19 Waverley Street, Bellerive	531452533	3	Trs	0.9	SM	0–350 mm grey silty SAND	
						CL	350–900 mm yellow/brown sandy CLAY	A
							900 mm+ slightly weathered SANDSTONE	
201	Opposite 17 Merindah Street, Howrah	533752517	3	Ps	0.7	ML	0–400 mm grey clayey SILT	
						CH	400–700 mm grey/black sandy CLAY	A
							700 mm+ highly weathered SILTSTONE	
202	Junction Pass Road and Goodwins Road, Rokeby	534852516	3	Tb	0.4	CH	0–400 mm brown sandy CLAY	A
							400 mm+ highly weathered BASALT	
203	Quarry west of Acton Road, South Arm Road junction, Lauderdale	538352493	3	Ps	0.6	ML	0–200 mm grey sandy clayey SILT	A
						CH	200–600 mm grey gravelly silty CLAY B	
							600 mm+ highly weathered SILTSTONE	
205	Magazine, Blinking Billy Point, Taroona	529052483	3	Tb	0.2	CH	0–200 mm brown silty gravelly CLAY	A
							200 mm+ highly weathered BASALT	
206	500 m west of Huon Road/Strickland Avenue junction, Cascades	522152490	3	Ps	0.85	SM	0–200 mm grey sandy SILT	
						SM	200–850 mm yellow/grey sandy SILT	A
							850 mm+ highly weathered MUDSTONE	
207	Sandy Bay Rivulet east of Turnip Fields	523052495	3	Trs		SM-SP	0–150 mm yellow/grey SAND	
						CH	150–350 mm orange/yellow sandy CLAY	A
						CH	350–1000 mm yellow/brown sandy CLAY	B
208	Junction Cambridge Road/Banks Street, Mornington	531652546	3	Trs	0.8	SM	0–250 mm yellow/grey silty SAND	
						SC	250–350 mm yellow/grey clayey SAND	
						CH	350–800 mm yellow/orange sandy CLAY	A
							800 mm+ highly weathered SANDSTONE	
209	Southern end of Natone Street, cliff face, Lindisfarne Point	528152554	3	Tb	0.55	CL	0–550m brown sandy silty CLAY	A
							550 mm+ highly weathered BASALT	
210	Opposite 16 Tianna Road, Lindisfarne	258652562	3	Ps	0.85	SM	0–250 mm grey sandy SILT	A
						ML	250–850 mm grey gravel clayey SILT	B
							850 mm+ highly weathered SILTSTONE	

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
193							1400	R			9	TS	P	S		
		30	*		8											
		52	*		15	3										XRD B mont:trace kaolin:moderate
194							1900	R			4	L	P	S		
		90	*		31	1										XRD A mont:moderate
195							2200	M			4	L	P	S		
		135	*		34	1										XRD A mont:ex.strong
196							2200	M			3	L	P	S		
		84	*		32	1										XRD A mont:v.strong
197		29	*		4		1800	R			5	TG	MG	S		XRD B mont:v.weak kaolin:v.weak
		70	*		16	0										
198							1900	R			2	TGS	P	S		
		118	*		25	0										XRD A mont:moderate kaolin:v.weak
199							1500	R			13	TGS	P	M		
		84	*		18											XRD A mont:weak kaolin:weak illite:moderate
		89	*		20	0										B mont:v.weak kaolin:weak illite:moderate
200							1600	R			10	TG	P/MG	S		
		34	*		8	3										XRD A mont:weak kaolin:v.weak illite:weak
201							1700	R			11	TS	P/MG	S		
		58	*		17	0										XRD A mont:weak kaolin:trace
202		58	*		21	0	2000	M			5	L	P	S		
203		39	*		8		1900	R			7	TS	P/MG	S		XRD A mont:v.weak kaolin:trace
		63	*		18	0.5										B mont:weak
205		71	*		13		2300	M			13	L	P	S		
206							1800	R			19	TGS	M	M		
		28	*		2											
207							1700	R			7	TG	P	S		
		85	*		18											
		86	*		20	0										XRD B mont:weak kaolin:trace illite:trace
208							1800	R			3	L	MG	S		
		56	*		13	0										XRD A mont:trace kaolin:weak
209		46	*		12	0	2200	R			70	F	P	U		
210		18	*		0		2000	R			17	TG	MG	S/M		
		41	*		12	1										XRD B mont:weak kaolin:trace

No.	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE	
211	13 Malunna Road, Lindisfarne	528952564	3	Trs	0.4	SP	0–150 mm grey SAND	
						CH	150–400 mm orange/brown sandy CLAY	A
							400 mm+ slightly weathered SANDSTONE	
212	50 m east of 48 Salvator Road, West Hobart	524852513	3	Trs	1.2	SM	0–150 mm brown gravelly silty SAND	
						SC	150–250 mm orange/grey clayey SAND	A
							250–1200 mm grey/brown sandy CLAY	B
							1200 mm+ slightly weathered SANDSTONE	
213	Elizabeth College, Elizabeth Street, North Hobart	526052534	3	Trs	1.35	ML	0–100 mm grey sandy clayey SILT	
						CH	100–950 mm yellow/green sandy CLAY	A
						CH	950–1350 mm yellow/brown sandy CLAY	B
							1350 mm+ highly weathered MUDSTONE	
214	Northeast end of McCrobies Gully Tip, Cascades	523452516	3	Ps	0.7	CH	0–300 mm grey/brown sandy CLAY	A
						CH	300–700 mm yellow/green sandy CLAY	B
							700 mm+ highly weathered SANDSTONE	
215	South end Acton Road, Lauderdale	538852499	3	Ps		SM	0–300 mm grey sandy SILT	
						CH	300–500 mm yellow/grey silty CLAY	A
						CH	500–1100 mm yellow/brown sandy CLAY	B
216	Junction Acton Road and Acton Drive, Acton	539352531	3	Trs	1.1	SM	0<150 mm orange/grey silty SAND	
						SC	150–250 mm orange clayey SAND	
						CL	250–1100 mm yellow/orange sand CLAY	A
							1100 mm+ slightly weathered SANDSTONE	
217	Junction Acton Road and Acton Drive, Acton	538852547	3	Tb	0.3	ML	0–300 mm brown gravelly clayey SILT	A
							300 mm+ highly weathered BASALT	
218	Upton Creek, Acton Road, Cambridge	538452563	3	Ts		CH	0–100 mm black sandy CLAY	
						CH	100–800 mm yellow/green sandy CLAY	A
220	Single Hill, Roches Beach	540952517	D					
223	Casimaty, Taroona	528952463	D					
224	Casimaty, Taroona	529052462	D					
225	Bardia Court, Single Hill	540352517	D				0–600 mm	
							650–750 mm	
226	Acton Road	539352517	D				650–850 mm	
							850–1250 mm	
227	Acton Road	539152523	D				550–900 mm	
							900–1500 mm	
228	Kirra Road	540852513	D				0–350 mm	
							350–700 mm	
							700 mm–	
230	Bardia Court, Single Hill	540552519	D				0–500 mm	
231	Roches Beach Road	540052512	D					
232	Roches Beach Road	539952511	D				0–350 mm	
							350 mm–	
233	Tara Drive	538252519	D				600–2100 mm	
234	Seven Mile Beach Road	540252530	D				100–1000 mm	
235	5 Jefferson Court, Lutana	525452569	D					
236	89 Doyle Avenue, Lenah Valley	523652541	D				2400–3400 mm	
							3400–4300 mm	
							4300–5200 mm	
240	Waterworks Road	525152496	D					

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
211							1600	R			9	TG	P	S		
		66	*		17	0										XRD A mont:weak kaolin:trace
212							1600	R			25	TG	P	M		
		28	*		6											XRD A kaolin:weak illite:weak
		39	*		12											B kaolin:v.weak illite:weak
213							1600	R			5	L	P	S		
		77	*		23											XRD A mont:strong
		65	*		14	3										B mont:v.strong
214		59	*		20	0	1800	R			15	TGS	P	S		XRD A mont:v.strong
		56	*		13	0										B mont:v.strong
215							1700	R			4	TG	P	S		
		54	*		22	3										XRD A mont:moderate kaolin:v.weak
		72	*		23	2										B mont:strong kaolin:weak
216							1600	R			7	L	MG/P	S		
		49	*		11											XRD A kaolin:moderate illite:strong
217		54	*		12		2200	M			9	L	P	S		
218							1200	R			1	G	P	S		
		86	*		21	2										XRD A mont:ex.strong
220		38	15	23	10	3										XRD mont:95 q:5
223		66	27	39	18											XRD mont:90 kaol:10
224		51	23	28	14											XRD mont:95 kaol:5
225		68	16	52	14											
		47	17	30	9											XRD mont:95 kaol:5
226		73	18	55	16											XRD mont:10 kaol:85 iron:5
		32	15	17	7											
227		45	16	29	8											XRD mont:10 kaol:75 g:15
		38	18	20	9											XRD mont:5 kaol:90 ill:5
228		26	17	9	5											
		35	16	9	7											XRD mont:55 kaol:25 ill:20
		29	19	10	5											
230		96	23	73	22											XRD mont:100
231		37	13	24	8											XRD mont:30 kaol:70
232		23	11	12	4											
		32	13	9	7											XRD mont:30 kaol:70
233		41	16	25	7											
234		32	14	18	6											XRD mont:20 kaol:45 ill:25 f:5 q:5
235		73	17	56	20											XRD mont:100
		100	21	79	27											XRD mont:100
236		79	19	60	22											
		61	17	44	18											XRD mont:25 kaol:25 ill:45 f:5
		60	19	41	17											
240		87	23	64	21											XRD mont:90 kaol:10

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
241	Daly, Howden	524252363	D				0–300 mm
							300–600 mm
							600–900 mm
							900–1200 mm
243	Acton Drive/Acton Rd junction	539252529	D				900 mm
244	Drysdale Avenue, Kingston	523752423	D				300–1200 mm
							1200–1800 mm
245	91 Giblin St	524152542	D				900 mm
							1350 mm
246	Ambrose, Droughty Point Rd	535152487	D				0–900 mm
							900–1800 mm
							1800–2250 mm
							0–200 mm
247	21 Montague St, New Town	524452536	D				0–200 mm
							200–700 mm
							700–1000 mm
248	EZ Company, Risdon	526152570	D				0–250 mm
							250–800 mm
							800–1500 mm
							1500–1700 mm
249	Susan Parade, Lenah Valley	522952536	D	Jd			0–800 mm
							800–1600 mm
							1600–2000 mm
250	Lampton Ave/Prince of Wales Bay	524552573	UR 83/20	Tb Jd	2.5	SM	0–200 mm fine to medium, dark grey SILTY
						CH	200–1000 mm high plasticity SANDY CLAY
						GC–CH	1000–2300 mm doleritic CLAYEY GRAVEL
251	Casuarina Crescent, Glenorchy	520852608	UR 76/16	Ts	10	GC–SC	0–10000 mm boulders in grey SANDY CLAY
252	Chigwell, south of Casuarina Crescent	520652606	UR 82/34	Qs Trs	8		500–1000 mm TOPSOIL
						GC	1000–8000 mm boulders in clay
							8000 mm+ mudstone/sandstone BEDROCK
253	Glenlusk Valley	517852586	UR 76/63	Qs Jd Ps	1–5		
254	Faulkners Rivulet, Glenlusk	517452589	UR 75/55	Ps	2.5	GC	0–1000 mm angular sandstone GRAV. CLAY
							1000+ mm mudstone BEDROCK
255	Cadbury Schweppes factory, Claremont	521752620	UR 81/45	Ts Jd Trs			
256	Casuarina Crescent, Glenorchy	520952607	UR 76/42	Qs Trs	5.3	SM	0–600 mm brown SILTY SAND
						SC	600–5300 mm grey-brown-red SANDY CLAY
							5300 mm+ sandstone BEDROCK
258		518652647					
259	Risdon Cove Historic site	526252596	UR 78/27	Qs Tb Ps			
260		538252437					
261		541252524					
262	Lots 36 & 42, Single Hill, Roches Beach	541152523	MD	Jd Ps	1	CH	0–1000 mm grey SILTY CLAY
							1000+ mm siltstone BEDROCK
263	South Arm Rd, Lauderdale	538552498	UR 80/43	Ps	2.5	CL–CH	0–250 mm SILTY SANDY CLAY
						GC	250–2500 mm GRAVELLY CLAY
							2500+ mm sandstone & siltstone BEDROCK

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
241	10															
	7	35	20	15	7											
	17	77	29	48	16											
	16	74	28	46	15											
243		47	23	24	9	4										XRD kaol:30 ill:60 f:10
244		80	26	54	22											
		56	24	32	15											
245	16	48	18	30	16											
	18	52	19	33	16											
246		41	15	26	12											XRD mont:60-65 kaol 35-40 q:25-30
		70	18	52	19											XRD mont:70-75 kaol:25-30 q:25-30
		92	24	68	23											XRD mont:85-90 kaol:10-15 q:10-15
		106	30	76	25											XRD mont:80-85 kaol:15-20 q:5-10
247	24	67	18	49	17											
	29	99														
	30	101	20	81	25											XRD mont:85-90 kaol:10-15 q:15-20
248	32	85	29	56	22											
	29	56	25	31	13											
	28	47	22	25	11											
	26	43														XRD mont:90+ f smithsonite
249	33	92	26	66	20											XRD mont:90 kaol:10
		40	23	17	9											XRD mont:90-95 kaol:5-10
		49	25	24	11											XRD mont:40-50 calcite:50-60
250							2800+	B								Proposed stormwater line, seismic and drilling investigation
251											4-11			U		Landslide investigation
252							2000+	R-M								Seismic survey along proposed sewer line
253											25	sgt		S-U		Landslide risk mapping
254											15			S		Stability inspection
255										Y						Groundwater investigation — geophysics (gravity modelling)
256										Y				U	Y	Landslide investigation
258																
259																Geological and geophysical investigation of historic site
260																
261																
262												gt		C		Subdivision proposal — stability & erosion assessment
263							500	R								Reservoir site investigationt — geophysics
							500	R								
							2000	B								

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
264	Risdon Cove Historic site	526452596	UR 78/38 UR 79/33	Tb Ps	10		0–2000 mm unconsolidated SILT 2000+ mm moderately compact SILT 12000 mm siltstone BEDROCK
265A	EZ Risdon, woodworking shop	525552578	MD	Jd	1	 CH	0–100 mm CONCRETE 100–250 mm red-brown plastic CLAY 250–1700 mm yellow-brown SANDY CLAY
265B	Marion Court, Pilchers Hill	529852561	UR 79/38	Trs			
266	East Risdon Road, Sugarloaf Hill	527952584	UR 75/40	Trs Ps			0–1800 mm soil and weathered ROCK 1800+ mm open jointed PERMIAN ROCK
267	Lanena Street, Warrane	530752538	UR 82/16	Jd			0–1200 mm soil and dolerite BOULDERS 1200–2500 mm weathered DOLERITE 2500+ mm fresh DOLERITE
268	Koluri Court, Lindisfarne	528252554	UR 77/08	Tb			0–1000 mm SOIL 1000+ mm weathered BASALT
270	Adjacent Bellerive Bypass Interchange, Mornington	533152544	UR 75/27 UR 75/51	Ps			0–400 mm grey SILTY SAND 400–3000 mm talus and GRAVEL 3000+ mm silstone and sandstone BEDROCK
272		541052427					
273		535052514					
275		524352540					
276	Derwent River—Elwick Bay to Macquarie Point	527452551	UR 75/23	Qs Jd Trs	20–50		uncompacted SILT and GRAVEL compacted SAND, CLAY, GRAVEL SANDSTONE BEDROCK
277	Derwent River— Bedlam Walls to Rock Cod/Woodman Point	527052569	UR 73/93	Tb Trs Ps	30		0–30m SILT 30+m BEDROCK
278	Huon Road, Ferntree	520552471	UR 73/48	Trs			SOLIFLUCTION DEPOSITS
279	Liverpool Crescent, West Hobart	524952510	UR 77/13	Jd Trs	1		
280	Shannuck Drive, West Hobart	524852519	UR 86/31	Trs	1	CH CH	0–1100 mm brown-grey plastic CLAY 1100–1300 mm red CLAY 1300 mm– brown shale BEDROCK
281	Macquarie Point sewerage treatment plant	527552524	UR 76/48	Jd			0–6200 mm FILL 6200 mm– fresh dolerite BEDROCK
282	Strickland Avenue, Hobart	521652493	UR 77/40	Qs PS			TALUS SILTSTONE BEDROCK
283	Telephone Exchange, Davey St	526652515	UR 77/24	Trs	2	CH	0–2000 mm CLAY FILL 2000 mm– SANDSTONE BEDROCK
284	Wilmslow Avenue, New Town	525152554	MD	Ts	11.5	CL SC	0–1800 mm black SILTY CLAY 1800–11500 mm CLAYEY SAND 11500 mm– BEDROCK
285	Kings car park, Argyle St, Hobart	526752521	UR 87/29	Trs	5.5		0–2400 mm GRAVEL & SAND FILL 2400–5500 mm SANDY CLAY & BOULDERS 5500 mm– SANDSTONE BEDROCK
286	Grays Road, Ferntree	520452471	UR 73/50	Ps	1	GM	0–1000 mm silty GRAVEL 1000 mm– mudstone BEDROCK
287	K-Mart site, New Town	524952549	UR 73/28	Jd	1		
288	Central Marine, Prince of Wales Bay	524352577	UR 77/30	Tb	1	CL	0–1000 mm unconsolidated SILT 1000 mm– basalt BEDROCK

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
264							480 1400 2200	R R B								Historical site investigationt — geophysics
265 A	 32 29	 85 56	 29 25	 56 31	 22 13											Foundation investigationt — ground heave
265 B										Y						Groundwater seepages
266							915 3000	R B								Seismic refraction surveyt — road cutting
267							350-600 1000-1800 3000+	R R B								Proposed reservoir investigationt — geophysics
268												c		U		Foreshore instability
270							300-700 1000-2000 3000+	R R B								Foundation investigationt — proposed building Geology and geophysics
272																
273																
275																
276																Geological evaluation of potential crossing sites over the Derwent River
277							1500 3000+	R B								Geophysical investigation of proposed river crossing
278														S		Stability assessment — proposed house site
279											22	g		S		Stability assessment — proposed subdivision
280											20	gt				Soil erosion — proposed subdivision
281															Y	Foundation investigation
282												sf		CU		Road failure
283							400-700 2000+	R R							Y	Foundation investigation
284							315-450 750-890 3000+	R R B							Y	Foundation investigation
285															Y	Foundation investigation
286										Y	12					Investigation of drainage problem
287																Foundation classification
288							1000	R								Over water seismic refraction survey

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
289	Old gas works site, lower Macquarie St	527152523	UR 86/18	Jd	2.3	GC	0–2300 mm boulders in SANDY CLAY
							2300 mm– dolerite BEDROCK
290	Old quarry, Poets Rd, West Hobart	525052516	UR 81/2	Trs	1	SC	0–1000 mm plastic yell–brown SANDY CLAY
							1000 mm– sandstone and siltsone BEDROCK
291	41 Louden St, South Hobart	524252509	MD	Jd	1.2	CH	0–1200 mm brown plastic CLAY
				Trs			1200 mm– sandstone BEDROCK
293	Tolmans Hill, Hobart Southern Outlet Road	525452493	UR 73/14	Jd			
294A		525052510					
294B	Tunnel Hill, Hobart Eastern Outlet Road	533952550	UR 73/67	Ts		SM	SAND
				Ps			mudstone, siltstone & sandstone BEDROCK
295	72 Wentworth St, South Hobart	524952504	MD	Trs		CH	yellow CLAY
296	70 Strickland Avenue, South Hobart	523252502	MD	Qs Ps		ML	gravelly SILT
297	Lynton Avenue	525452502	MD	Trs			
298	35A Liverpool Crescent, West Hobart	525252510	MD	Jd	2	GC	0–2000 mm doleritic GRAVELLY CLAY
299	692 Sandy Bay Road, Sandy Bay	529252480	MD	Ts		CL	0–300 mm dark grey–black SILTY CLAY
						CH	300–500 mm boulders in dark grey CLAY
						GC	500–900 mm dol. & mudst. GRAVELLY CLAY
300	Selfs Point, proposed depot	525752558	MD	Ts Tb	3.3		0–3300 mm FILL
							3300 mm– BASALT

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
289							350-470	R							Y	Foundation investigation, geophysics, drilling
							900+	R								
290											10-12	g		S		Stability assessment — old quarry faces
291											20			S		Stability assessment
293																Stability assessment — road cuttings
294A																
294B											65-85					Stability assessment — road cuttings
295														U		Expansive soil and drainage problem
296																House damage — differential settlement & drainage problem
297														U		Inspection of a landslide site
298											20-25			?U		Stability assessment
299														S		Stability assessment — test pits
300							350-400	R							Y	Foundation investigation
							1800-1900	R								

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
301	McRobies Rd, Louden St intersection, South Hobart	523952508	MD	Trs	1		0–1000 mm SAND 1000 mm– weathered BEDROCK
302	Salamanca Arts Centre, Salamanca Place	526952515	MD	Jd			CLAY over dolerite BEDROCK
303	32 Romilly St, South Hobart	525252498	MD	Jd			FILL over dolerite BEDROCK
304	42–44 Bramble St, Ridgeway	523552469	MD	Jd	1		thin SILTY soil over dolerite BEDROCK
305	820 Sandy Bay Rd, Sandy Bay	529352471	MD	Jd	1-2.5	GC	0–2500 mm high plasticity GRAVELLY CLAY 2500 mm– weathered dolerite BEDROCK
306	Lot 66, Susan Parade, Lenah Valley	522952535	MD	Jd			0–800 mm dark brown friable CLAY 800 mm– dolerite boulders in CLAY
307	197 Waterworks Rd, Dynnyrne	524352495	MD	Trs			CLAYEY SAND & SANDY CLAY
308	155 Waterworks Rd, Dynnyrne	524552496	MD	Jd			dark brown/black CLAY
309	152 Waterworks Rd, Dynnyrne	524552496	MD	Jd	1.5		0–1500 mm unconsolidated SOIL 1500 mm– dolerite BEDROCK
310	102 Waterworks Rd, Dynnyrne	525152497	MD	Jd			
311	52/54 Waterworks Rd, Dynnyrne	525452498	MD	Jd	1	CH CH GC	0–500 mm black CLAY 500–1000 mm yellow-brown SANDY CLAY 1000 mm– weathered dolerite BEDROCK
312	28A Waterworks Rd, Dynnyrne	525552500	MD	Jd	0.7	CH GC	0–250 mm black high plasticity CLAY 250–700 mm brown-black GRAVELLY CLAY 700 mm– weathered dolerite BOULDERS
313	4 Tara St, South Hobart	524452508	MD	Trs			SAND with CLAY over sandstone BEDROCK
314	Australian Commonwealth Carbide Works, Electrona	521352323	UR 74/70	Tb Trs	14.9		0–3500 mm sand, sandy clay FILL 3500–14900 mm SAND 14900 mm– sandstone BEDROCK
315	Taroona High School & foreshore area	528252441	UR 76/68	Qs Ts			
316	Carinya St, Blackmans Bay	528952454	UR 82/28	Trs		SM CH CL SC	0–300 mm brown-black SILTY SAND 300–1100 mm yellow-orange plastic CLAY 1100–1800 mm grey mottled SANDY CLAY 1800–2000+mm yellow brown CLAYEY SAND
317	Norwood Ave/Belhaven Ave, Taroona	528552451	UR 77/35	Ts		OH CH	0–900 mm black peaty CLAY 900–1800 mm dark grey plastic CLAY
318	Channel Highway, Taroona — reservoir site	528452453	UR 76/55	Ps			grey topsoil with cobbles & boulders pebbly sandstone & mudstone BEDROCK
319	Taroona High School, Belhaven Ave, Taroona	528552451	UR 77/36	Ts		CH CH CH SC	0–900 mm green grey plastic CLAY 900–4600 mm green grey plastic CLAY 4600–5500 mm brown plastic CLAY 5500–7300 mm fawn brown SANDY CLAY
320	near Riverdowns Drive, Margate	521252362	UR 79/24	Ps			0–172 m Woody Island Siltstone 172–306 m Basal Tillite 306–331+ m Dolerite
321	Harts Hill, Margate	520552342	UR 79/25	Ps			0–30 m Harts Hill Limestone 30–70 m Hickman Formation 70–100+ m Bundella Mudstone
322	Woodbridge Hotel, Woodbridge	520352337	UR 75/25	Ps			
323	Karingal Court, Taroona	528952455	MD	Ts			
324	Taroona High School, Taroona	528752452	UR 76/12	Ts			

No.	M	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
301												g		SCM		Site inspection — subdivision proposal
302																Site inspection — stability of old quarry face
303														MU		Site inspection — building
304								MB						S		Site inspection — building
305											13-22			U		Site inspection — proposed building
306	33	92	26	66	20						12			S		Site inspection — proposed building expansive soils
307											8-10	sg		S		Site inspection — erosion problems
308											22-27	g		SC		Site inspection — building & erosion damage
309							350-1400 2000-3000	R MB			20-25			CU		Site inspection — earthflow geophysics — seismic refraction survey
310											15-20			U		Site inspection — landslide
311											18-25			SM		Site inspection — foundations, slope stability
312												g		SM		Site inspection — development proposal
313											15		P	U		Site inspection — proposed subdiv. (landslide area)
314							610-900 915-1830 2135-3000+	R R MB								Foundation investigation — drilling, geophysics
315											30	fc		SU		Site inspection — marine erosion
316	 24 17	 69	 24	 45	 17									S		Site investigatione — expansive soils
317	44 47	83	17	65	26										Y	Site investigatione — expansive soils
318								R B			12.5			S		Site inspection — proposed reservoir site
319														U		Site investigation — landslide
320															Y	Geological investigation — stratigraphic diamond drill hole
321															Y	Geological investigation — stratigraphic diamond drill holes
322										Y						Site inspection — siting of water bore
323											5-10			M		Site inspection — slope stability
324											8			SC		Site inspection — expansive soil, slope stability

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
325	Bonnet Hill, Taronga Rd, Channel Highway area	526952430	UR 76/60	Jd	0.9–1.3	CH	0–400 mm black plastic CLAY
						CH	400–900 mm yellowish CLAY
							900 mm– weathered dolerite BEDROCK
326	Bonnet Hill, Channel Highway	526952425	UR 77/34	Jd Trs Ps	1–2		
327	Dunns Creek, Kingston	524352432	UR 79/30	Ps			siltstone & minor sandstone
328	see site 319						
329	North West Bay	523052362	UR 73/30	Ts Jd Trs	14		-9 to -14 m depth MUD
							-14 m weathered dolerite BEDROCK
331	Tyndall Beach, Kingston	527052419		Trs			
333	Hutchins St, Kingston	525452411		Trs			
334	36A Auburn Rd, Kingston	525752409	MD	Trs			
336	near Whitewater Creek, Kingston	522652413	UR 75/74	Ts Jd Trs Ps	1–3	SM	0–200 mm grey sandy LOAM
						CH	200–1000 mm brown CLAY
							1000–2800 mm weathered dolerite BEDROCK
337	Boronia Hill, Kingston	524252403	UR 75/74	Trs	2–5	SM	0–300 mm grey-black sandy LOAM
						SP	300–800 mm grey-white SAND
						SC	800–2500 mm yellow-brown SANDY CLAY
							2500 mm– clayey sandstone BEDROCK
338	Turnip Fields	522752491	H036	Ps	1.5+	SM	0–200 mm TOPSOIL
							200 mm– clay and boulders in SILTY GRAVEL
339		520752473	H189				
340		533652460	C034				
341	Opossum Bay Beach	532752398		Qsa			
342	Gordons Hill Road, Lindisfarne	529652556	C001	Trs	3.7+		0–800 mm dark grey SAND & FILL
							800–1400 mm light grey SAND
							1400–3700 mm grey-yellow CLAYEY SAND
343	Roebourne Rd, Old Beach	523852612	C006	Trs	0.4	CH	0–400 mm some sand in plastic CLAY
							400 mm– sandstone/siltstone BEDROCK
344A	Government Hills	526952586		Ps			
344 B	6 Bayfield St, Rosny Park	530152538	C002	Jd	0.8	CH	0–800 mm brown/black plastic CLAY
346		524952579	H047				
347	Bathurst St, car park	526352521	MD	Jd Trs	2.5+	GC	0–400 mm CLAYEY GRAVEL
						CH	400–1600 mm SANDY CLAY
						SC	1600–2500 mm CLAYEY SAND
							2500 mm– sandstone BEDROCK
348		524352526	H019				
349		521752489	H152				
350	Nicholas St, Lower Sandy Bay	528352478	H001			CH	0–800 mm brown high plasticity CLAY
							800 mm– dolerite BEDROCK
351		528652472	H229				
352		525452496	H166				
353	Davey Place, South Hobart	525652504		Jd			
354	Kings car park, Argyle St, Hobart	526852521	UR 87/29	Ts Trs			0–2400 mm gravel & sand FILL
							2400–5400 mm boulders in CLAY
							5400 mm– sandstone BEDROCK
355	Oak Hill, Rosetta	519952581		Jd			
356	near Lowestoft, Main Rd, Berriedale	520352602	G093	Ts		CH	0–700 mm black high plasticity CLAY
						CH	700–1500 mm yellow-brown plastic CLAY

No.	M	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
325										16-19				CU		Site investigation — subdivision proposal
																landslide, expansive soils
326										11-26			Mg/G	SC		Site investigation — subdivision proposal
327																Site investigation — damsite, geophysics
328																
329							1500	R								Site investigation — marine seismic refraction survey
							3000+	B								
331										Y		gt	P	S		Site reference point
333																
334												t		S		Site inspection — erosion & seepages
336							460	R								Site investigation — proposed cemetery site
							870-1300	R								
							1600-2530	RM								
337							460	R								Site investigation — proposed cemetery site
							460	R								
							1990-3065	RB								
338																Site reference point
339																Site reference point
340																Site reference point
341												c	P	U		Foreshore erosion — destruction of boat sheds
342																Site reference point
343																Site reference point
344 A								M				sgt	P	S		Site reference point
344 B																Site reference point
346																Site reference point
347																Site investigation — building foundations
348																Site reference point
349																Site reference point
350																Site reference point
351																Site reference point
352																Site reference point
353										20+			P	MD		Site reference point
354															Y	Site inspection — building foundations
355												g	P	U		Site reference point
356												g				Site reference point

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
357	Dooleys Avenue, Berriedale	519452591	G112	Ps		SM	0–250 mm yellow-brown, fine SILTY SAND
						SW/SC	250–1250 mm gravelly sand in CLAYEY SAND
358	Battersby Drive, Chigwell	519752613	G082	Trs		SM	0–200 mm brown, fine-medium SILTY SAND
						SC	200–500 mm grey, medium CLAYEY SAND
						SC	500–1500 mm+ yellow-grey CLAYEY SAND
360	Whitestone Point	520152647		Trs			
361	Montrose Rd, Montrose	520652578	G146	Ps	2+	SM	0–300 mm brown, fine SILTY SAND
						GM	300–2000 mm grey brown SILTY GRAVEL
							2000 mm– sandstone & siltstone BEDROCK
362	Richards Rd, Chigwell	517952595	G104	Ps	0.4	SM	0–400 mm fine grained SILTY SAND
							400–1000 mm sandstone BEDROCK
363		524552586	H046				
364	Junction Glenlusk/ Collinsvale Rd	518352592		Ps	1.5		
365	Marys Hope Rd, Berriedale	519652591	G108	Jd	0.5	CH	0–500 mm dark brown high plasticity CLAY
							500 mm– weathered dolerite BEDROCK
366	Springfield Avenue, West Moonah	522752552	G170	Jd	0.9	CH	0–500 mm dark brown high plasticity CLAY
						CH	500–900 mm yellow-brown plastic CLAY
							900–1400+ mm weathered dolerite BEDROCK
367	Barossa Rd, West Moonah	521752557	G154	Ps	1.2	SM	0–400 mm brown SILTY SAND
						SC	400–1200 mm yellow/grey CLAYEY SAND
							1200–2200+ mm sandstone BEDROCK
368	Lenah Valley Rd	520552530		Ps	2		
369		534052502					
370	Caves Hill, Meehan Range	531752584	C020	Jd	0.7	SP	0–700 mm brown GRAVELLY SAND
						GC	700–1500 mm brown GRAVELLY CLAY
							1500 mm– weathered dolerite BEDROCK
371	Smiths Rd, Risdon Vale	528452611					
372	Tinderbox Rd, Howden	525552327		Tb			
373	Gellibrand Drive, Mortimer Bay	539052418		Ps			
375	Flagstaff Gully Dam	530452568	TR 8/18	Ps			MUDSTONE BEDROCK
376	Dowsing Point— Courtoys Point	524952585	TR 8/19	Qs Jd Trs		ML	0–11270 mm unconsolidated SILT
							11270–13720 mm CLAY and SHINGLE
							13720 mm sandstone and shale BEDROCK
377	Risdon Brook Dam	527552603	TR 9/11	Tb Jd			
			TR 9/11	Trs Ps			
378	Cadbury's factory, Claremont	521652619	TR 9/18	Ts Tb		GM	0–2000 mm GRAVEL and SAND
							2000–3000 mm weathered BASALT/TUFF
							3000–4300 mm ?GRAVEL
							4300–11300+ mm vesicular BASALT
379	Life Science & Medical Centres, University of Tasmania	526352495	TR 10/13	Jd		CH	0–2000 mm light grey-brown CLAY
						GC	2000–6200 mm BOULDERS & CLAY
							6200 mm– weathered dolerite BEDROCK
380	St Johns Park New Town	523552546	TR 10/13	Qs Jd	6	GM	0–6000 mm river GRAVEL
							6000 mm– weathered dolerite BEDROCK

No.	M	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
357																Site reference point
358												t				Site reference point
360								R			7	gt	P	S		Site reference point
361																Site reference point
362																Site reference point
363																Site reference point
364								M				s	L	S		Site reference point
365																Site reference point
366																Site reference point
367																Site reference point
368								R			30+		P	M		Site reference point
369																Site reference point
370											15-20	l	P	S		Site reference point
371												gt	P	U		Site reference point
372								R				g	M	S		Site reference point
373												sgt	M	S		Site reference point
375										Y						Damsite investigation – failure on leakage path
376															Y	Foundation investigation – proposed bridge site geology, and drilling
377																Geological mapping – regional scale
378																Foundation investigation – test pits, drilling
379														S	Y	Foundation investigation
380														S		Damaged buildings – expansive soils

No	LOCATION	COORD	REF	ROCK	DEPTH	USC	PROFILE
381	10 Murray St	526852517	TR 10/13		7.3		0–3000 mm FILL
				Ts Tb			3000–7300 mm consolidated SEDIMENTS
				Trs			7300 mm– sandstone BEDROCK
382	Risdon Brook dam site	526752615	TR 11/14	Jd			0–3000 mm weathered dolerite BEDROCK
							3000 mm– fresh dolerite BEDROCK
383	Australian Commonwealth Carbide Co., Electrona	521152325	TR 13/3	Ts	13		0–1000 mm SOIL
							1000–3000 mm white-cream SANDY CLAY
							3000–13000 mm orange, red, yellow CLAY
							13000 mm– mudstone BEDROCK
384	State Library, Murray St	526452520	TR 13/11		9.5		0–1500 mm FILL
				Qs			1500–9500 mm boulders in CLAY
				Trs			9500–15000 mm shale & sandstone BEDROCK
385	College of Advanced Education, Mt Nelson	525552478	TR 13/11	Jd	1	GC	0–1000 mm dolerite boulders and CLAY
							1000 mm– dolerite BEDROCK
386	CMF training centre, Tasman Highway, Warrane	530652540	TR 13/11	Jd	0.6		0–300 mm TOPSOIL
							300–600 mm CLAY
							600 mm– dolerite BEDROCK
387	Army depot, Dowsings Point	524352588	TR 13/11	Jd	2.7		0–2000 mm soil and FILL
							2000–10000 mm unconsolidated CLAY & SAND
							10000 mm– weathered dolerite BEDROCK
388	Area school, Collinsvale	516152571	TR 14/24	Ps	1		0–1000 mm angular siltstone with CLAY
							1000 mm– mudstone and siltstone BEDROCK
389	Supreme Court, Salamanca Place, Hobart	526852515	TR 14/25 14/26		3		0–3000 mm pebbles in silty clay FILL
				Trs			3000 mm– sandstone/mudstone BEDROCK
390	Wrest Point Hotel, Sandy Bay	529652534	TR 15/28		3		0–3000 mm soil and FILL
				Ts			3000 mm– boulders in SANDY CLAY
391	Rosny Matriculation College, Rosny	529552524	TR 15/28	Trs	4.5		0–4500 mm topsoil and CLAY
				Jd			4500–7300 mm highly weathered dolerite
							7300 mm– fresh dolerite BEDROCK
392	Bellerive By-Pass Road	532052538	TR 15/29			SC	0–6000 mm SANDY CLAY
				Trs			sandstone BEDROCK
							mudstone/siltstone BEDROCK
				Jd			dolerite BEDROCK
393	Hope Beach, South Arm	537152354	TR 15/30	Ts	120		0–120000 mm SAND & CLAY
				Ps			120000 mm– siltstone BEDROCK
395	Pipeclay Lagoon, South Arm	542352420	TR 17/21	Ts	150	SC	0–150000 mm SAND & CLAY
				Jd Ps			150000 mm– BEDROCK
396	144–148 Macquarie St, Hobart	526652517	TR 17/32	Ts	7	CH	0–7000 mm orange & grey CLAY
				Jd			7000–8100 mm weathered dolerite BEDROCK
				Trs			8100 mm– quartz sandstone BEDROCK
397	Hodgman property, Browns River, Kingston	523452434	TR 17/33	Qs	2.5		0–150 mm alluvial SILT & SAND
				Trs			150–2500 mm CLAYEY GRAVEL
							2500 mm– sandstone BEDROCK

No.	MC	LL	PL	PI	LS	Dis	Veloc	Rip	Const	G/W	Slope	Erod	Septic	Stabil	Drill	Comment[1]
381															Y	Site investigation – proposed building
382																Quarry site investigation – geophysics
383															Y	Evaluation of clay deposit
384							300-500	R								Site investigation – foundations
							770-910	R								geophysics
							1900+	M								
385							460	R								Site investigation – foundations
							1200+	MB								geophysics
386							335	R								Site investigation – foundations
							1070	R								geophysics
							2060+	MB								
387							250	R								Site investigation – foundations
							840-1220	R								geophysics
							1680-2670	MB								
388													P			Site inspection – drainage problem
389							300-610	R								Site investigation – foundations
							2290-3050	MB								geophysics
390							300	R								Site investigation – foundations
							1680	R								geophysics
391															Y	Site investigation – foundations
																geophysics
392							600-900	R								Site investigation – road alignment
							1400-1700	MB								geophysics
							3000-4500	B								
							3000-4500	B								
393							1700	R								Local geological survey – residual gravity anomaly
							4200	B								geophysics – gravity and seismic refraction
395							1500-1600	R								Local geological survey – residual gravity anomaly
																geophysics – gravity and seismic refraction
396															Y	Site investigation – foundations
397							300-400	R				gt			Y	Site investigation – proposed cemetery
							900-1100	R								
							2600-4200	MB								