PIM DEPT.

Blenheim Drainage & Digger Hire Ltd.
P.O. Box 926.
BLENHEIM

Phone: 03 57 842 77
Fax: 03 57 842 76
Mobile:027 60 88 5 66

Thursday, 3 November 2005

Subject: On Site waste water Disposal system for G Price
PT Sec 1 50 99 Maraetai Bay
Tory channel
Marlborough Sounds

Person who did the investigation	Murray Warburton
Person completing this report	Murray Warburton
Date of site investigation	23-10-2005
Soil category found on site	type 4
Ground slope at effluent disposal site	5 degrees
Distance to the nearest surface water body	35 meters
Distance to nearest Dry watercourse	20 meters
Distance to nearest water supply	more than 60 meters
Depth to ground water	More than 2 meters
Number of bedrooms in the dwelling	6 bedrooms
Number of full time occupants	3 equivalent persons
Maximum number of occupants	12 equivalent persons
Water supply	tank water
Total capacity of waste water system	9900 litres
Design Irrigation rate	25
Daily flow rate in total	1680 litres day

Stream

∴ 180L/waste/person/day

Murray has said 12×140 = 1680

Should be 12 × 180 = 2160

total 9900

Blenheim Drainage & Digger Hire Ltd.
P.O. Box 926.
BLENHEIM

Phone: 03 57 842 77
Fax: 03 57 842 76
Mobile:027 60 88 5 66

Thursday, 3 November 2005

This property in question is situated at the head of Maraetai Bay in the Tory channel, Queen Charlotte Sounds and is on an elevated site approximately 60 meters back from the foreshore. At present the property has a large one bedroom dwelling which Gary Price intends to convert into a two bedroom dwelling with a one bedroom flat attached. He also intends to add a 3 bedroom home stay business onto this existing dwelling which would give a total of 6 bedrooms with a maximum accommodating capacity on this property of 12 equivalent persons. The water supply for this property comes via a holding tank which is fed from a running stream further up Maraetai Bay. Based on this and working in accordance with appendix 4-2 D AS/NZS/1547:2000 the total daily flow rate from this building would be 1680 litres per day. Upon doing the site investigation I dug two test holes down to a depth of 800mm and found there to be three main soil horizons. See attached photos. The first soil horizon consists of 200mm of type 3 loam which formed a ribbon length of 25mm. The second soil horizon consists of a type 4 clay loam which formed a ribbon of approximately 45mm but which contained a lot of sharp gravel fragments as the photographs indicate. This soil horizon went down to a depth of 700mm below ground level where the gravel fragments became far more consistent which indicated a change to a courser beach gravel if the test hole had been excavated any deeper, so for design purposes I have worked on a soil category 4 design loading rate. The nearest neighbouring effluent system is that on lot 3 DP 6474 which is situated around the front of the dwelling and which would place it more than 50 meters from the effluent disposal site of Mr Gary Price. The nearest surface water body is the running stream which takes in the main water catchment of Maraetai Bay and runs past the existing dwelling on the west side. The nearest part of this stream to the nearest point of the proposed effluent disposal site would be 35 metres and with a small raised ridge between these 2 points which the existing dwelling currently sits on, the possibility of any contamination into this stream would be nil. There is a dry water course to the east of the disposal site which runs through the base of lot 3 DP 6474 and I suspect would only carry water at times of heavy rainfall periods. The closest point of this dry water course to the closest point of the effluent disposal site would be 20 meters but given the rich vegetation covering between these 2 points and the proposal of a secondary waste water plant along with the coarsely fragmented type 4 clay loam soil with a 200mm loam topsoil covering I think the possibility of contamination from the surface leaching of waste water to be unlikely. As this site is on a higher level of approximately 5 to 6 meters above the high tide mark and looking at the dips and hollows around the property I would estimate the water table depth at a spring tide to be around 5 meters below ground level at the proposed disposal site. I propose installing a 3900 litre primary single chamber septic tank coupled up to a secondary 3000 litre septic tank fitted with a baffle and a Bio filter which will be coupled up to a 3000 litre Kiwitreat 2 pump aeration tank and 500 meters of pressure compensating drip lines buried 100mm deep with emitter spacings at 600mm and line spacings at 1 metre centres. Although this property is fairly sizable the suitability of areas in which to install a waste water disposal system is fairly limited due to boundaries and streams so a full reserve field would be unlikely obtainable. However the lawn area in front of the existing dwelling would accommodate a reserve field of 200 meters of drip line and with the use of an aerated system being used the chances of the soil absorption around the drip lines clogging is very unlikely due to the reduced suspended solids and the enhanced aerobic digestion and in the event of the drip lines them selves becoming clogged a

clogged a reserve field is available between the existing line spacings. The disposal area has good exposure to both wind and sun and is presently planted in grass pasture and I therefore believe that the proposed system is the best possible option for this site.

NOTE: This design was done by Murray Warburton and is to be installed by Blenheim Drainage and Digger Hire LTD only.
This design was not drawn with the intention of it being used by any other contractor than Blenheim Drainage and Digger Hire LTD and there fore no liability for this design will be accepted if any other party except Blenheim Drainage and Digger Hire LTD are the installers and Murray David Warburton is the Drainlayer responsible for overseeing the instillation of this design .

KiwiTreat.

A Sewage Treatment Plant For Domestic Sites.

Technical Description.

Purpose and Scope.

To provide a sewage treatment plant of the extended aeration activated sludge type suitable for up to ten equivalent persons, which produces treated wastewater of suitable quality for use above and below ground, as per the requirements of the Regulatory Authorities.

The system is designed to:

1. Be user friendly.
2. Have low maintenance and service requirements.
3. Be very reliable in operation and performance.
4. Match the site requirements through its modular components to function under viable conditions.
5. Be acceptable in areas of environmental and conservation interest.

The system is designed to give continuous peace of mind performance.

Wastewater Characteristics.

Hydraulic Load.

The wastewater volume generated by a household has been calculated using well-proven and documented guidelines.

Sewage flow: Average per day = 2000 litres.
(Ten equivalent persons x 200 litres each per day).
Peaking factor = 4, giving an estimated maximum loading of 330 litres per hour.

Organic Load.

The strength of the wastewater from a house is calculated in terms of grams per day of BOD_5.
The design figure utilised is 700 grams per day, and is derived from the industry-accepted figure of 70 grams of BOD_5 per person per day.

Aeration Module.

The aeration module utilises 3000 litre tank.
The aeration module is provided to allow the wastewater to come into contact with both suspended biomass and attached growth biomass. This contact and subsequent degradation of the fine particulate and soluble organic material occurs in the controlled introduction of air.
The normal aerated volume in this system is 2700 litres, with a surge capacity of 1100 litres. This surge capacity ensures a uniform discharge through the clarifier to the discharge chamber.

The aeration system has a design F/M ratio of 0.05 when taking the plate pack attached biomass into account. The above figures are well within the industry accepted extended aeration range.

Plate Pack Media.

A high surface area to volume plastic media is fitted to the aeration chamber. This media provides a suitable growth surface for stable attached growth biomass. The growth characteristics of this biomass promote good nitrification, some denitrification (with inherent stability) and good settling characteristics of the waste sludge. The media packs provide a surface area of 44m2, not including the tank and associated componentry. The total surface area for biomass growth is in excess of 61m2.

Aeration.

The aeration tank is provided with intermittent aeration for 18 hours each day. This process promotes denitrification and hence stable biomass and suitable pH in the mixed liquor of the aeration tank. In order to provide in excess of 2.4 grams of oxygen per gram of BOD_5, more than 12 litres of air per minute is provided to the system. The aeration is by means of venturi and is of the coarse bubble type. This is the chosen method of aeration for the following reasons:

1. It supplies large volumes of air in relation to the energy input.

Disposal.

Disposal is normally by dripline via a non return valve. The system includes 500 metres of pressure compensated, non drain dripline specifically manufactured for effluent disposal, and a flushing valve. The site conditions and the environmental conditions of the area govern the size of the disposal area. It is recognised that quality and the disposal of the resultant liquid are of paramount importance to all concerned.

System Monitoring.

The system is monitored by alarms situated at the control box and inside the house.
The alarms inside the house are audible and visual. A switch is provided to mute the audible alarm when heard.
The alarm at the control box is audible.
The alarms are activated if the following units malfunction:

1. The aeration pump.
2. The disposal pump.
3. A disposal line blockage.
4. The venturi system.
5. A clarifier blockage.

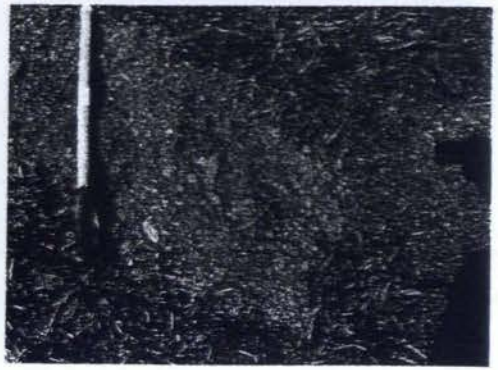
Discharge Quality.

Quality of discharge is of paramount importance. The system is designed to meet the following standards.

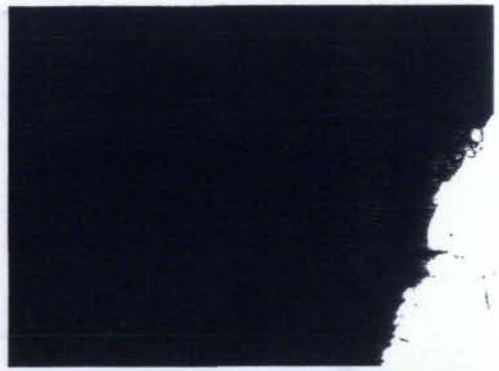
1. Faecal coliforms – not more than 30 cfu/100 mls, if disinfected.
2. BOD_5 – not greater than 20mg/litre.
3. Suspended solids – not greater than 30mg/litre.
4. Free chlorine – not less than 0.5mg/litre, if disinfection is required.

051197

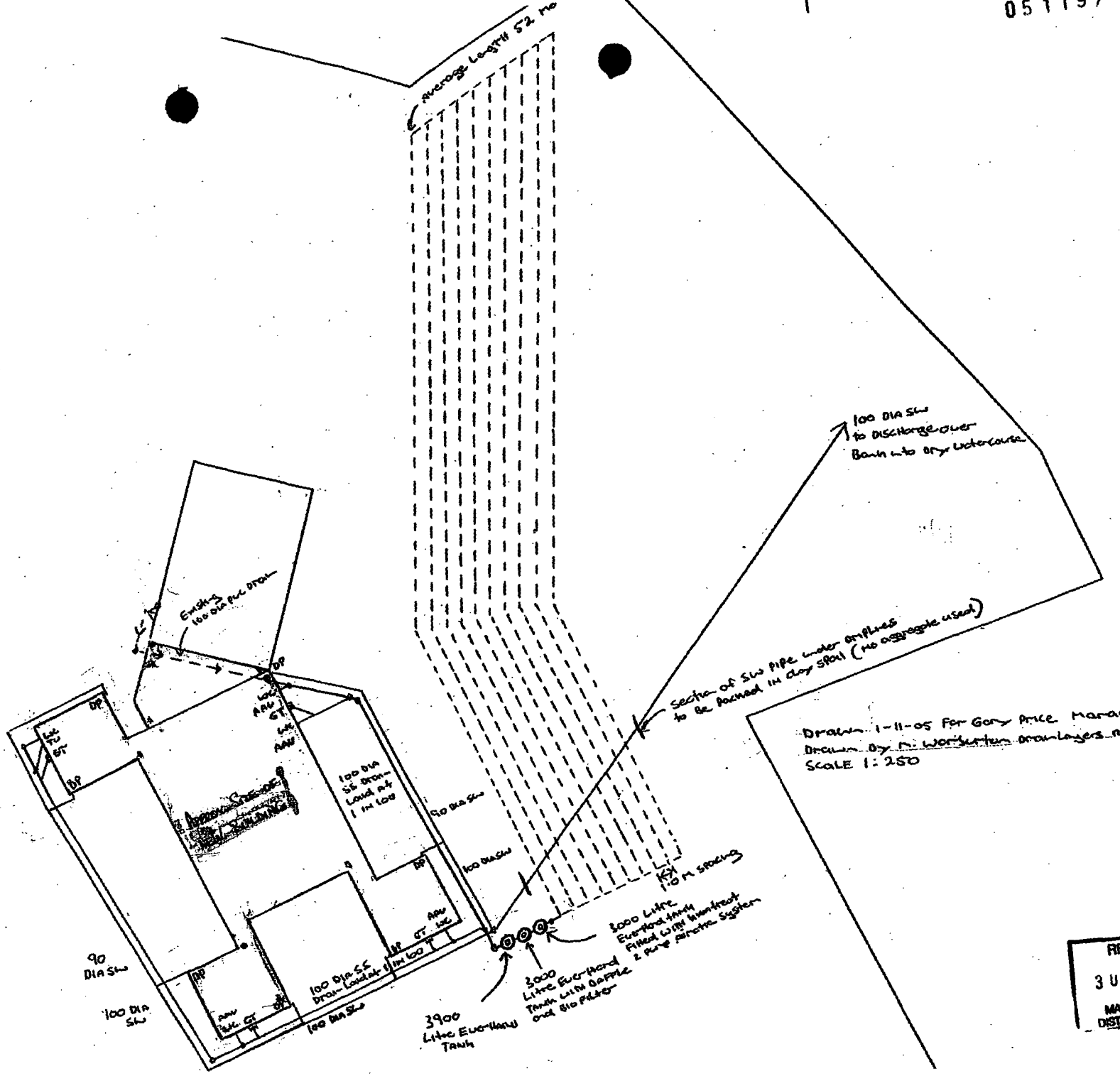








Quality of photos as provided by applicant.


Average Length 52 m
Existing 100 DIA PVC DRAIN
100 DIA SW to discharge over Bank into any watercourse
Section of SW pipe under driveway to be packed in dry sand (no aggregate used)
Drawn 1-11-05 For Gary Price Maraetai Bay
Drawn by N. Worlsurton draughtsmen reg No 13901
SCALE 1:250
100 DIA SW
50 DIA SW
90 DIA SW
3900 Litre Ecoflow Tank
3000 Litre Ecoflow Tank with baffle and Bio Filter
3000 Litre Ecoflow Tank Fitted with Inverbrass 2 pump aerotec System
1.0 m spacing
RECEIVED
3 0 NOV 2005
MARLBOROUGH DISTRICT COUNCIL

Blenheim Drainage & Digger Hire Limited.
Post Office Box 926.
BLENHEIM

Phone: 03 57 842 77
Fax: 03 57 842 76
Mobile:027 60 88 5 66

Thursday, 2 February 2006

AMENDMENT

Subject: On Site waste water Disposal system for	Gary Price PT SEC 1 SO 99 Maraetai Bay Tory channel Marlborough Sounds
Person who did the investigation	Murray Warburton
Person completing this report	Murray Warburton
Date of second site investigation	17/01/2006
Soil category found on site	type 4
Ground slope at effluent disposal site	5 degrees
Distance to the nearest surface water body	30 meters
Distance to nearest Dry watercourse	17 meters
Distance to nearest water supply	more than 60 meters
Depth to ground water	More than 2 meters
Number of bedrooms in the dwelling	6 bedrooms
Number of full time occupants	3 equivalent persons
Maximum number of occupants	12 equivalent persons
Water supply	creek water
Total capacity of waste water system	9900 litres
Design Irrigation rate	25
Daily flow rate in total	2160 litres day

Blenheim Drainage & Digger Hire Limited.
Post Office Box 926.
BLENHEIM

Phone: 03 57 842 77
Fax: 03 57 842 76
Mobile:027 60 88 5 66

Thursday, 2 February 2006

Amendment to on site waste water system for Gary Price, Maraetai Bay Tory Channel.

This property in question is situated at the head of Maraetai Bay in the Tory channel Queen Charlotte sounds and is on an elevated site approximately 60 metres back from the foreshore. At present the property has a large one bedroom dwelling which Gary Price intends to convert into a two bedroom dwelling with a one bedroom flat attached. He also intends to add a 3 bedroom home stay business onto the existing dwelling which would give a total of six bedrooms with a maximum accommodating capacity on this property of twelve equivalent persons. The water supply for this property comes via a creek supply which is fed from further up the main valley to the south of the dwelling and would be well over 60 metres from the chosen effluent disposal site. Based on this and working in accordance with the MDC guidelines for onsite waste water disposal, the total daily flow rate from this dwelling/home stay would be 2160 litres per day. Upon doing the first and second site investigation five test holes were dug in total, down to a depth of 600 and 800mm. Three main soil horizons were found but varied with each hole. The first soil horizon varied from between 200 and 300mm of type 3 loam topsoil with a 50mm grass vegetation covering and contained very little to no moisture content. The second soil horizon consisted of 300 to 400mm of type 4 clay loams down to a depth of 600 to 800mm. these type 4 loams contained very little or no fragments in the test holes on the eastern side of the disposal field but contained course fragments in the test holes on the western side of the disposal field. This second soil horizon once again contained very little moisture which would be partly due to the time of the year and partly due to the third soil horizon down below 700 to 800mm which became very rocky indicating a change to an underlying course gravel, given the distance to the foreshore and the two water courses either side of the property. The nearest neighbouring effluent system is that on lot 3 Dp 5474 which is situated around the front of the dwelling and which would place it more than 50 metres from the effluent disposal site of Mr Gary Price. The nearest surface water body is the running stream which takes in the main water catchment of Maraetai Bay and runs past the existing dwelling on the west side. The nearest part of this stream to the nearest part of the effluent disposal system would be 30 metres.

There is a definite ridge between this creek and the effluent disposal site, the slope at the disposal site slopes to the east so any possibility of contamination to the running stream to the west would not be possible. There is a dry water course to the east of the disposal site which runs through the base of lot 3 and I suspect would only carry water at times of reasonable rain fall. The closest point of this dry watercourse to the closest point of the effluent disposal site would be 17 metres, but given the rich vegetation covering between these two points and the proposal of a secondary waste water plant I think the possibility of contamination from the surface leaching of waste water to be unlikely. As this site is on a higher level of approximately 5 to 6 metres above the high water table mark and looking at the dips and hollows around the property I would estimate the water table depth at a spring tide to be around 2 metres maximum below ground level at the chosen disposal site.

I recommend installing a 3900 litre primary single chamber septic tank coupled up to a secondary 3000 litre septic tank fitted with a baffle and Bio Filter which will be coupled up to a 3000 litre Kiwitreat 2 pump aeration tank. The disposal field shall consist of thirteen x fifty metre runs of pressure compensating drip lines with one metre line spacing and .600 emitter spacings buried 100mm deep in the loam topsoil. This would give an immediate aerial loading area of 650m^2 with the ability to disperse 500mm either side of the outer driplines giving a true aerial loading area of 700m^2 which is 95m^2 more than the calculated

605m² required. A full reserve field would be difficult to obtain on this property without encroaching within the distance requirements of the surface water body. By installing a secondary treatment system and reducing the suspended solids and enhancing the aerobic digestion the likelihood of the soil absorption around the drip lines becoming clogged would be most unlikely and in the event of the driplines themselves becoming clogged they can be uplifted an replaced or another set of driplines could be installed in between the existing line spacings. The disposal area has good exposure to both wind and sun it is presently planted in grass pasture and I there fore believe that the proposed system is the best possible option for this site.

Blenheim Drainage & Digger Hire Limited.
Post Office Box 926
BLENHEIM

Phone 03 57 842 77
Fax 03 57 842 76
Mobile 027 60 88 5 66

Tuesday, 21 February 2006

For Guy Bodington

Here is the producer statement from Kiwitreat.

Regards

Gloria

KiwiTreat

Eco System.

(With additional 3900 litre septic tank)

For Individual Households.

Producer Statement

Designed and Built in New Zealand
by

KiwiTreat Ltd

Horrelville. RD1. Rangiora
Phone: 03 3125787 Fax: 03 3125780

KiwiTreat.

Eco Treatment System
For
Domestic Wastewater

Producer Statement.

Purpose and Scope.

To provide a sewage treatment plant of the aerated activated sludge type suitable for up to twelve equivalent persons, which produces treated wastewater of suitable quality to meet the requirements of the Regulatory Authorities.

The system is designed to:

1. Meet the requirements of AS/NZS 1547:2000 On-site domestic wastewater management.
2. Be user friendly.
3. Have extremely low maintenance and service requirements.
4. Be very reliable in operation and performance.
5. Meet the discharge quality requirements of AS/NZS 1546.3.2001 On-site domestic wastewater treatment units.
6. Be acceptable in areas of environmental and conservational interest.
7. Be very cost effective at the treatment and disposal of the resultant liquid.

This system is designed to give continuous peace of mind performance.

Wastewater Characteristics.

Hydraulic Load.

The wastewater volume generated by a household has been calculated using well-proven and documented guidelines.

Sewage flow: Average per day = 3000 litres.

Based on a minimum design flow of 200 litres/person/day, with a peaking factor of 300 litres per hour.

Organic Load.

The strength of the wastewater from a house is calculated in terms of grams per day of BOD_5.
The design figure is 1050 grams per day, and is derived from the industry-accepted figure of 70 grams of BOD_5 per person per day.

The septic tank reduces the organic load by acting as a primary sedimentation tank and an anaerobic digester. The reduction allowance is 30% of organic strength. This results in a BOD_5 to be treated by the aerobic module of 735 grams per day.

Process Description.

The sewage treatment plant is an activated sludge type, incorporating a measured batch discharge, and with an in-plant surge capacity of 3000 litres.

The initial component of the plant is two septic tanks that act as primary settling tanks and solids digesters.

A chamber where aerobic treatment occurs follows this.

The treated wastewater then passes through a clarifier to the pump chamber, where it is then pumped to the disposal area when sufficient volume is available for discharge.

Septic Tank.

The primary treatment is achieved by the utilisation of two septic tanks in series, upstream of the aerobic module.
The first tank is an Everhard 3900 litre septic tank, followed by an Everhard 3000 litre tank with a primary chamber working volume of 1740 litres, and a secondary chamber working volume of 860 litres.

Most of the insoluble waste remains within the primary chamber. The liquid fraction and small volume solids pass through to the secondary (anoxic) chamber, where significant quantities of nitrogen and nitrogenous compounds are removed from the system. This has the

effect of maintaining the pH levels of the resultant liquid within an acceptable range for the aerobic bacteria working in the downstream processes.
The inclusion of bio-filters at the discharge area of each primary tank helps to further improve the quality of the wastewater before the aeration stage, by further reducing the solids fraction. This filter also assists in moderating surge volumes.

Aeration Module.

The aeration module utilizes a second Everhard 3000 litre tank, which allows the wastewater to come into contact with both suspended biomass and attached growth biomass. This contact and subsequent degradation of the fine particulate and soluble organic material occurs in the controlled introduction of air. The settled effluent in the aeration chamber is re-seeded with acclimatised stable biomass. This process provides all the advantages of a step treatment system.

The normal aerated volume in this system is 2500 litres, with a surge capacity of 1100 litres. This surge capacity ensures a uniform treatment of the effluent before discharge to the disposal area.

The aeration system has a design F/M ratio of 0.05 when taking the plate pack attached biomass into account. The above figures are well within the industry accepted guidelines.

Plate Pack Media.

A high surface area to volume plastic media is fitted to the aeration chamber.

This media provides a suitable growth surface for stable attached growth biomass.

The growth characteristics of this biomass promote good nitrification, some de-nitrification (with inherent stability) and good settling characteristics of the waste sludge.

The media packs and the tank and associated components provide a total surface area for biomass growth in excess of 46m2.

Aeration.

The activated sludge tank supplies controlled aeration for 24 hours each day.

This eco process promotes denitrification and hence stable biomass and suitable pH in the mixed liquor of the aeration tank.

More than 2.4 grams of oxygen per gram of BOD_5 is provided to the system through a venturi. This is the chosen method of aeration, for the following reasons:

1. It supplies large volumes of air in relation to the energy input.
2. It operates without creating a buildup of bacteria around the air discharge area.
3. It aerates to the full depth of the tank, and therefore treats the total volume of the liquid in the aeration chamber.
4. It has the ability to be shut down at specified times for further de-nitrification to take place, which helps promote stable biomass and suitable pH.
5. The venturi system does not require any maintenance or servicing.

The air for the venturi is sourced from outside the tank, so only fresh air is made available for the process.

Clarifier.

A proprietary 450-litre clarifier chamber is part of the activated sludge system.
The purpose of this chamber is to assist in the removal of suspended solids before the treated liquid reaches the pump chamber for disposal.

The chamber also controls surging to ensure that the wastewater is properly treated before further downstream processing.

Pump Chamber.

This chamber services a working volume of over 750 litres of aerated liquid per cycle, of which 60 to 65 litres of treated liquid is pumped to the disposal area, when treated liquid meets a specific volume, through an additional bio-filter/sediment filter combination.

Disinfection.

Disinfection, when required, is by chlorination, which takes place after the pump out chamber.
The chlorinator remains effective by means of chlorine tablets moving down a magazine system into the operating area as required.
There is no possibility of chlorine contamination of any of the previous treatment stages.

Disposal.

Disposal is through a non drain pressure compensated drip-line via a non-return valve.
The dripline is protected by a high capacity filter.
The system includes 600 metres of pressure compensated, self-flushing non drain drip-line specifically manufactured for effluent disposal.
The site conditions and the environmental conditions of the area govern the size of the disposal area.
It is recognised that treatment quality and the disposal of the resultant liquid are of paramount importance to all concerned.

System Monitoring.

The system is monitored by audible and visual alarms.
The alarms monitor the following:

1. The aeration sequence.
2. The disposal sequence.
3. The correct operation of the disposal line.
4. The venturi system.

Discharge Quality.

Treatment quality of the resultant liquid is recognised to be of paramount importance.
The system is designed to meet the following standards:

1. BOD5 – not greater than 20mg/litre
2. Suspended solids – not greater than 30mg/litre.
3. Faecal coliforms – not more than 30cfu/100 mls, when disinfected.
4. Free chlorine – not less than 0.5mg/litre, when chlorinated.

Servicing.

Servicing of the system is recommended at six monthly intervals

05 1197

17 Feb 06

Site visit GB & Murray W + Gary + David Price
9.00 — 11.30

Agreed: house now not well loc. wrt. to property boundaries.
G+D. Price spend ± 1 hr repositioning pegs. Reposition drip line field with NW → will fit before ROW on NE side.

NORTH

11m R.O.W.

AVERAGE LENGTH 52 m

creek bed

approx. pit (3)

100 DIA SW to DISCHARGE over Bank into dry watercourse

9m

Existing 100 DIA PVC DRAIN

WC FU GT DP

WC AAV GT WC AAV DP

APPROX SIZE OF NEW BUILDING

100 DIA SS DRAIN-LOAD AT 1 IN 100

90 DIA SW

100 DIA SW

90 DIA SW

100 DIA SS DRAIN-LOAD AT 1 IN 100

DP AAV GT WC

100 DIA SW

3900 Litre EVERHARD TANK

3000 Litre EVERHARD TANK WITH BAFFLE and BIO FILTER

3000 Litre EVERHARD FITTED WITH Wastreat 2 PUMP AERATION SYSTEM

Section of SW Pipe under driveway to be Packed in clay spoil (no aggregate used)

wooden peg set in ground

7m to edge first drip line

pit (2)

pit (1)

1.0 M SPACING

14m

creek bed

Drawn 1-11-05 For Gary Price Marahau Bay
Drawn By D. Worburton Draftsmans Reg No 13901
SCALE 1:250

Amended Waste Water System for G PRICE
Pt Sec 150 99 Maraetai Bay
tary Channel
Drawn by N. Warburton
Scale 1:500

N

creek

3900 Litre Effluent Tank

3600 Litre Effluent Tank with baffle and D10 Filter

3600 Litre Effluent Tank Fitted with Biofilter 2 pump aerobic system

605 m2 Areal Drip line Area

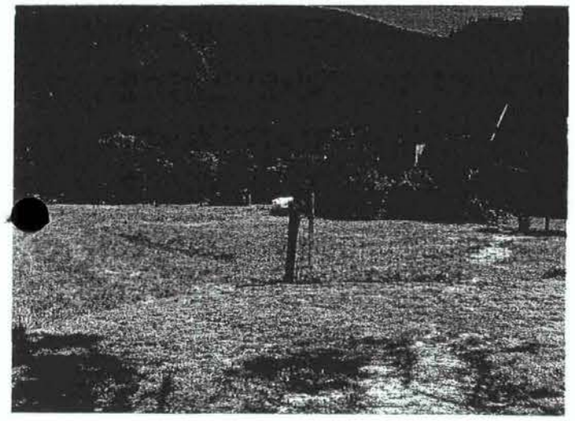
creek

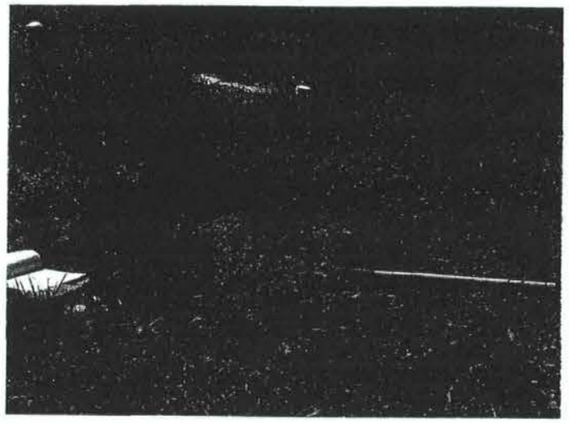
RECEIVED
- 3 FEB 2006
MARLBOROUGH DISTRICT COUNCIL

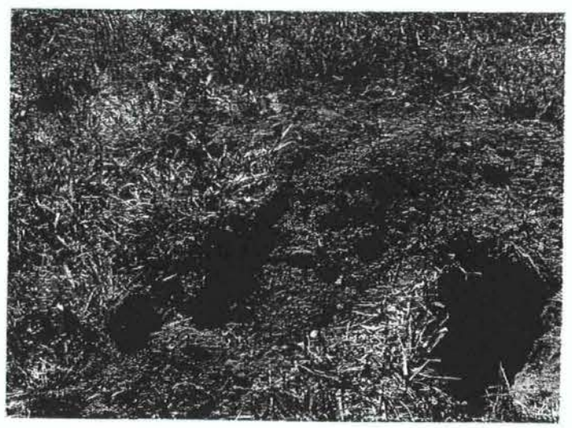
QuickMap
Custom Software Ltd

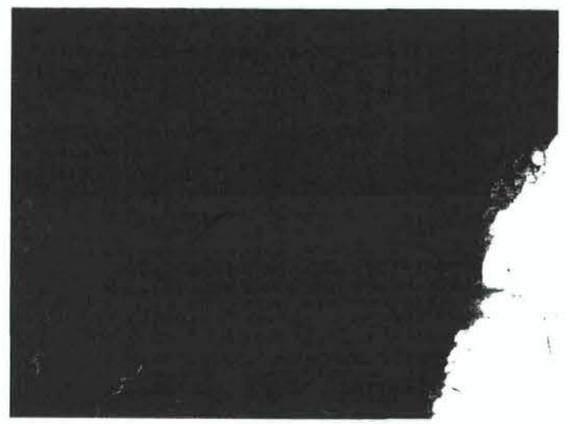
0 5 10 15 20 25 30 35 40 45 50 55 60 65m

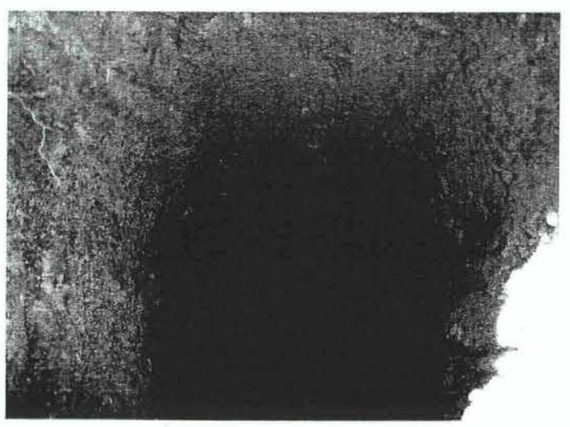
051197











Quality of photos as provided by applicant.