

**SANDSPIT MOTOR CAMP
ON-SITE WASTE DISPOSAL
MANAGEMENT PLAN**



Colin Ashby Consulting
Structural, Civil & Geotechnical Engineering
3 Elizabeth Street, P O Box 124, Warkworth
Ph 09 425 9422 Fax 09 425 9431 E-mail: cashbyc@wk.planet.gen.nz

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FILE No:	
UNIQUE No:	9858
RECEIVED	
- 9 JUL 1999	
Auckland <i>Regional</i> Council	
ATTENTION:	JULIAN ROBERTS
INFORMATION:	
ACTIONED:	

Introduction

In accordance with the Resource Consent granted by the Auckland Regional Council (Permit No 22315), a Management Plan is required for the Wastewater Treatment and Disposal Systems.

Resource Consent

The Resource Consent is a vital part of the overall Management Plan and the conditions outlined therein are to be complied with. A copy of the Resource Consent is Appendix to and forms part of this management plan.

The Resource Consent shall be carefully worked through and all matters contained therein implemented prior to exercising of the permit.

Letter of Verification

A letter of verification in accordance with clause 4 of the permit is herewith attached, verifying that all components of the wastewater treatment and disposal system have been inspected and installed in accordance with standard engineering practice, with plans submitted with this Application and with the specifications and conditions of the permit.

As Built Plans

'As built' plans are appendix to this management plan setting out the layout of the treatment disposal system.

Inspection & Operation Programme

(Refer clause 24 of Resource Consent Permit)

Plant

To include requirements (a), (b), (f), (h)

Daily

Read and record in log book meter reading (1 December to 28), (To be reviewed after first 12 months).

Inspect aeration tanks and clarifier tower and remove leaves and other debris if necessary.

~~Inspect U.V. lamp at least once ever second day and clean or replace if necessary?~~ A spare lamp must always be kept available.

Ensure correct functioning of plant.

Weekly

Clean scum build-up from walls of Aeration tanks if necessary.

Monthly

First day of every month read and record in log book meter reading (1 March to 30 November).

Dismantle and clean U.V. sterilization unit.

Test audible pump alarm.

Quarterly

Sample effluent from 2,700 litre storage tank (prior to discharge to the dosing syphon) on the last Monday morning of the months of January, April, July and October 2001 (Ref: Appendix C Item 20 – 25).

Six Monthly

Inspect and maintain septic tank, aeration tanks, treated wastewater holding tank, buffer tanks and the biosolid filters for sludge build up (if combined depth of sludge occupies more than half the tank depth, tank must be cleaned).

Sample effluent (after October 2001) last Monday morning of January and July (Ref: Appendix C Items 20-25)

Two Yearly

Early December. Desludge septic tank and clean biotube filter 1999, 2001 etc.

Disposal System

(To include requirements (d) (g)).

Shift dripper lines systematically across field at approximately one meter spacings.

24 Dec to 31 Jan at least every second day

1 Feb to Easter at least once a week

Easter to 24 Dec when mowing field

Maintenance Schedule

Disposal Field **(To include requirements (c) and (d)).**

Mow grass cover on disposal field on a regular basis so that grass cover does not exceed 100mm in length.

Six Monthly

Purge dripper lines of any accumulated solids.

Annually

Aeration pump dismantled and checked by a qualified pump technician in early December and veins replaced if deemed necessary.

All other pumps serviced or replaced if problems occur. A replacement pump is to be utilised during servicing.

Tank lines, meters etc visually inspected for defects.

General Maintenance

Good vehicular access to the treatment and disposal systems must be maintained at all times.

Signage to be erected (Appendix A)

- (1) Adjacent the disposal area
- (2) Kitchen
- (4) To be erected in a visible location close to the pump.

A log book recording complaints, emergencies, failures, problems and remedial action taken shall be kept onsite and be made available to ARC officers during normal working hours by appointment (Ref: Appendix C Item 17).

Ensure wastewater and recycled water meters are in good working order.

Contingency Plan

Actions to be taken in the event of failure of part of the system.

If audible alarm sounds:

1. Ascertain the cause of the problem.
2. If problem is deemed to take more than 1 hour to remedy, contact sewerage disposal contractor to remove waste.
3. Place notices in ablution block restricting water usage e.g. (no showering) (Ref: Appendix C (3)) until the problem is remedied. (Showers are metered so won't work anyway in the case of power failure).
4. Remedy problem as soon as possible.

Sufficient area has been set aside to enable the disposal fields to be increased in size by at least 200% if necessary.

The effectiveness of the disposal field area shall be kept under review particularly during periods of high patronage and if necessary the size of the fields shall be increased.

Emergency Procedures

Two hours emergency storage in the septic tanks and treated wastewater holding tank above the high water audible alarm system float, designed to sound in the event of any pump failure, shall be provided.

Note to achieve this it may be necessary to lower the level of the float switches and or raise the level of the emergency overflow outlet.

An agreement has been entered into (See Appendix B) with McJIMRAY Septic Tank Cleaners (Ph 09 423 7014 or 025 909 289) for 24 hour emergency attendance, with a response time of less than 2 hours so as to draw surplus effluent and or sludge promptly so as to avert or minimise the potential for an unauthorised discharge to occur.

Camp management shall also take the following steps to limit water usage and effluent generation during an emergency situation:

1. Turn off urinals.
2. Restrict or band use of the showers.
3. Erect temporary signs advising of the emergencies situation and requesting co-operation of campers to limit water usage while repairs to the sewage treatment system are underway.

Emergency Response Personnel

In accordance with clause 14 of the Resource Consent, a list is appendix of emergency personnel for call out on a 24 hours per day basis 7 days a week, giving the names of the people including contact phone number. The list is arranged in pecking order of priority.

Brian Morrison	(Owner)	425 8610		
Vanessa Morrison	(Owner)	425 8610		
Helen Lewis	(Assistance Manager)	425 9710	Private	
		425 8610	Business	
Graham Adolf	(Electrician)	425 9194		
McJIMRAY	(Septic Tank Cleaners)	423 7014		
		025 909 289	Mobile	
Colin Ashby	(Consultant Engineer)	425 9422		
		025 949 694	Mobile	

APPENDIX A

SIGNAGE

(1)

NO UNAUTHORISED ENTRY

BEYOND THIS POINT.

**EFFLUENT DISPOSAL DRIP
IRRIGATION**

SYSTEM OPERATING

Sandspit Motor Camp Management

(2)

**NO CHEMICALS OR TOXIC
SUBSTANCES OR FOOD WASTE**

**SHALL BE DISPOSED OF TO
WASTEWATER TREATMENT SYSTEM.**

**PLEASE USE BIO DEGRADABLE SOAP
POWDERS AND DISHWASHING LIQUIDS
ETC**

Sandspit Motor Camp Management

EMERGENCY

**YOUR CO-OPERATION IS
SOUGHT TO LIMIT WATER
USAGE**

AS

WE ARE CURRENTLY WORKING

ON

**REPAIRING THE SEWAGE
TREATMENT SYSTEM.**

Sandspit Motor Camp Management

**EMERGENCY RESPONSE PERSONAL
IF
ALARM SOUNDS**

(Please contact first on list and work downwards if no response)

Brian Morrison	(Owner)	425 8610	
Vanessa Morrison	(Owner)	425 8610	
Helen Lewis	(Assistance Manager)	425 9710	Private
		425 8610	Business
Graham Adolf	(Electrician)	425 9194	
McJIMRAY	(Septic Tank Cleaners)	423 7014	
		025 909 289	Mobile
Colin Ashby	(Consultant Engineer)	425 9422	
		025 949 694	Mobile

Sandspit Motor Camp Management

APPENDIX B

Letter of Agreement With Septic Tank Cleaner

**McJIMRAY**

Mac McLaren
Septic Tank Cleaning
R.D.3
Warkworth

Phone/Fax 09-4237014
Mobile 025 909 280

27 May 1999

Brian Morrison
Sandspit Motor Camp
R.D.
Warkworth

Sandspit Motor Camp

Dear Sir,

In response to your request re: call-out time in event of power failure at the Sandspit Motor Camp at Warkworth, please find the enclosed commitment.

The call out time would be no longer than 2 hours, and the response vehicle would be a 9x9 cubic meter vacuum truck.

Yours faithfully,

Mac McLaren

APPENDIX C

AUCKLAND REGIONAL COUNCIL RESOURCE CONSENT

PERMIT No. 22315

AUCKLAND REGIONAL COUNCIL

RESOURCE CONSENT

PERMIT NO. 22315

CONSENT HOLDER: Brian Morrison Family Trust & Vanessa Morrison
Family Trust (operating as Sandspit Motor Camp)

FILE REFERENCE: 7835

CONDITIONS OF CONSENT

Date of Commencement of Consent: 30 June 1999

First Date of Review: 30 June 2000

Date of Expiry of Consent: 30 June 2014

Purpose of Consent: To discharge up to 25m³/day of contaminants to
land for the purpose of disposing of treated
wastewater to ground soakage in accordance with
Section 15(1)(b) of the Resource Management Act
1991.

Quantity: That the maximum daily discharge shall not exceed
25m³.

Site Location: Sandspit Motor Camp, 1334 Sandspit Road,
Sandspit.

Map Reference: NZMS 260 R09 655327

Definition: 'Council' means the Auckland Regional Council.

'Manager' means the Manager, Land and Water Quality Section, Auckland Regional Council, or nominated Council staff acting on the Manager's behalf.

General

1. This resource consent is granted by the Council subject to its servants or agents being permitted access to the relevant parts of the property at all reasonable times for the purpose of carrying out inspections, surveys, investigations, tests, measurements or taking samples.
2. The conditions of this consent (including any specified quantity) may be reviewed pursuant to section 128 of the Resource Management Act 1991, by the giving of notice pursuant to section 129 of the Act, in the year of 2001 and subsequently at two yearly intervals thereafter commencing in the month of July of that year, for any of the following purposes:
 - i. To deal with any significant adverse effect on the environment which may arise from the exercise of the consent and which was not apparent at the time of the granting of the consent; or
 - ii. To vary the maximum daily discharge volume in light of changed circumstances or the results of monitoring; or
 - iii. To vary the design requirements of the system in light of changed circumstances or the results of monitoring; or
 - iv. To require a Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment; or
 - v. To deal with any adverse effect on the environment arising or potentially arising from the exercise of this consent through altering or providing specific performance standards; or
 - vi. To alter monitoring requirements in light of previous monitoring results obtained from previous monitoring and/or changed environmental and/or hydrological knowledge.
3. The maximum daily discharge volume permitted by this consent will be reviewed 12 months from the granting of this consent and may be varied, with the agreement of the Council and the Consent Holder, according to the results of water meter readings taken from the water meter specified in condition 18.
4. The wastewater treatment and disposal system shall be constructed and installed in accordance with the conditions of this permit and in accordance with the Engineer's plans and, specifications submitted as the applicant's proposal, "Engineering Report for Sandspit Motor Camp Onsite Waste Disposal - Colin Ashby Consulting November 1998" which will form part of this permit.

5. Prior to the exercising of this permit, a Registered Engineer, experienced in wastewater treatment shall verify in writing to the Manager that all components of the waste water treatment and disposal system have been inspected and installed in accordance with standard engineering practice, with the plans submitted with this application and with the specifications and conditions of this permit.
6. The Consent Holder shall provide 'as-built' plans for the layout of the treatment and disposal system clearly showing the precise location of the treatment system and any modifications from that initially proposed and showing the location of the reserve area required by Special Condition 7 below. These plans shall be submitted to and approved by the Manager prior to exercising this permit.

Maintenance

7. Sufficient area shall be reserved on the same site as the disposal system to enable the disposal fields to be increased in size by at least 200%.
8. The septic tank, aeration tanks, treated wastewater holding tank buffer tanks and the biosolids filters shall be inspected and maintained on a six monthly basis, and the tanks cleaned out when the combined depth of sludge and scum occupies more than half the tanks depth, but in any event the tanks shall be desludged two yearly.
9. The UV disinfection unit shall be inspected at least once every 2 days and cleaned at least once every month, when inspection indicates appropriate. A spare UV lamp shall be kept available at all times.
10. The Consent Holder shall ensure that good vehicular access to the treatment and disposal systems is maintained at all times so that maintenance can be carried out.

Signage

11. The Consent Holder shall install appropriate signage adjacent to the disposal area to discourage access by unauthorised personnel.
12. The Consent Holder shall erect signs in the toilet block and kitchen advising that no chemicals or other toxic substances, or food waste, shall be disposed of to the wastewater treatment system.

Emergency Procedures

13.
 - i. The Consent Holder shall ensure there is 2 hours emergency storage in the septic tanks and treated wastewater holding tank above the high water level alarm specified in Special Conditions 14 below.
 - ii. Within the management plan, procedures shall be outlined to be put in place, to limit water usage and effluent generation during an emergency situation.
 - iii. Either a contract shall be entered into with a septic tank cleaning firm to respond to an emergency within 2 hours Or A standby (not electric) pump and a standby storage tank capable hour storage of effluent, shall be available.
14. The Consent Holder shall install an audible alarm system designed to sound in the event of any pump failure.
15. The Consent Holder shall ensure that appropriate persons shall be available and shall respond as soon as practicable to any alarm sounding in an emergency arising from the from the wastewater treatment and disposal system on a 24 hours a day, seven days a week basis. A copy of the names of the people including a contact number shall be submitted to the Manager and shall be appended to the management plan required by Special Condition 26 below.
16. That the Consent Holder shall install public notices providing 24 hour emergency numbers to be called in the event of any alarm sounding or an emergency arising from the treatment plant and disposal system. The signs should be placed in a prominent position next to the treatment plant.
17. That the Consent Holder shall maintain a log book recording complaints and emergencies from the treatment and disposal systems. The details which shall be recorded in this log book include the following;
 - The name of complainant, the time and date the complaint was made.
 - The nature of the complaint.
 - The time and date at which the complaint was responded to and remedial action taken.

The log book shall be made available to ARC officers during normal working hours by appointment. These results shall be forwarded to the Manager along with water meter readings.

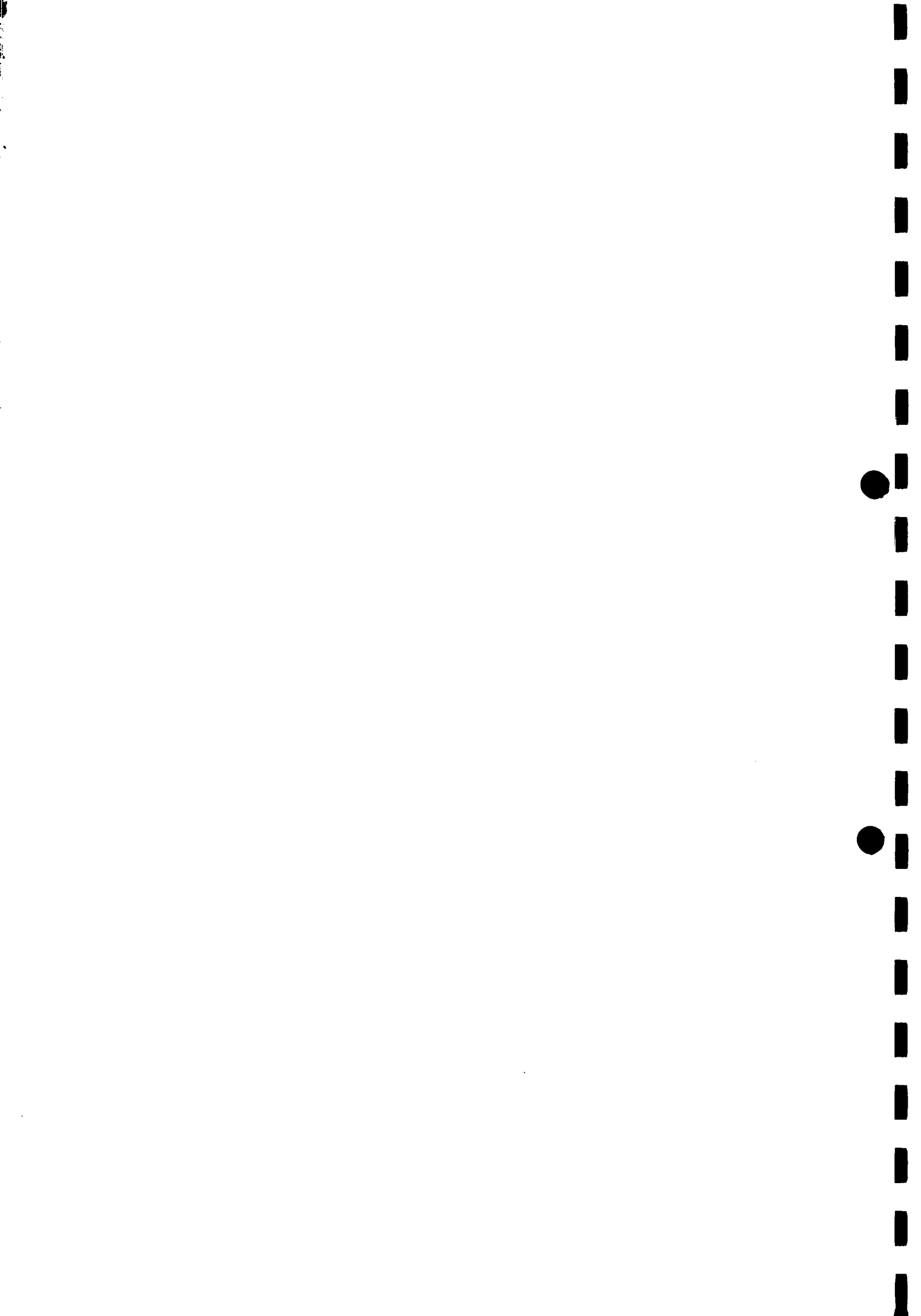
Monitoring

18. The Consent Holder shall continuously measure the flows to wastewater disposal systems and to the recycled water volume with water meters capable of measuring to an accuracy of plus or minus 5 %. The meter shall be installed in accordance with the manufactures specifications and shall be maintained in good working order at all times.

19. The Consent Holder shall ensure that meters required by Special Condition 18 above, are read on the following basis:
- i. During the period 1 December to 28 February of each year, the meters shall be read on a daily basis at the same time of each consecutive day; and
 - ii. During the period 1 March to 30 November of each year the meters shall be read on a monthly basis at the same time of the first day of each month.

These readings shall be recorded in a log book and the flow records shall be forwarded to the Manager quarterly by 1 March, 1 June, 1 September and 1 December of each year.

20. An effluent sample shall be taken from the 2,700 storage tank prior to discharge to the dosing syphon on the last Monday morning of the months of January, April, July, & October until October 2001 and then twice annually on the last Monday morning of the months of January & July in accordance with the schedule and procedure specified in the Management Plan required by Special Condition 26 below.
21. The samples required by Special Condition 20 above shall be analysed within 12 hours of sample collection for biochemical oxygen demand, suspended solids and faecal coliforms and shall be collected and analysed in accordance with latest edition of the "Standard Methods for the Examination of Water and Wastewater", published by the American Public Health Association, the American Water Works Association and the Water Environment Federation, or equivalent as approved in writing by the Manager.
22. The results obtained in accordance with Special Condition 21 above shall be recorded in a log book and a copy forwarded to Manager within one month of the date the sample was taken.
23. The samples required by condition 20 shall; be analysed for the following parameters:
 - Suspended Solids
 - Faecal Coliforms
 - Enterococi
24. The quality of the wastewater discharged to the irrigation system shall conform with the following standards:
 - Suspended Solids better than 20 mg /l.



25. In the event of any sample having a contaminant quality that exceeds the maximum limits specified in Special Condition 24 above, the following action shall be taken:
- The Manager shall be advised of the analysis results identified within 7 days of receipt of the result; and
 - The Consent Holder shall ensure action is taken immediately to address and remedy the problem and advise the Manager immediately of actions taken; and
 - A further sample shall be taken within 7 days of receipt of the analysis results for the previous sample and analysed in accordance with Special Condition 21 above and these results forwarded to the Manager within 7 days of receipt of the result.

Management of the System

26. A Registered Engineer or suitably qualified consultant experienced in wastewater engineering shall prepare a management plan for the wastewater treatment and disposal systems. This plan shall be prepared in accordance with the conditions of this permit and shall contain the following;
- a. An inspection programme to verify the correct functioning of the wastewater treatment and disposal systems.
 - b. A schedule for the daily, weekly, monthly and annual operational requirements including reading of the water meter.
 - c. A schedule of maintenance requirements for the pumps, septic tanks, biotubes, recirculation tanks, treated effluent holding tank, UV disinfection unit, water meters, and disposal field.
 - d. A schedule of maintenance requirements for management of vegetation on the wastewater ground disposal area.
 - e. A contingency plan specifying the actions to be taken in the event of failure of any component of the system and any other non-compliance with the conditions of this permit.
 - f. Details of a schedule for the desludging of the septic tanks and cleaning of the biotubes.
 - g. Details of how the ground disposal system will be managed.
 - h. A sampling and monitoring program in accordance with Special Conditions 20-22 of this consent including sample site locations, sample method and sample timing.

A copy of this management plan shall be forwarded to and approved in writing by the Manager prior to the exercising of this permit.

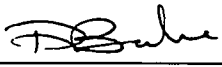
27. The Consent Holder shall maintain the system in an efficient and professional manner in accordance with the management plan and the conditions of this permit, to ensure that any works that are necessary to this shall be done by the Consent Holder within one month of written notice from the Manager.
28. That the Consent Holder shall record in the log book, required in Condition 17 above, any problems which are detected within the system and shall outline the action taken to remedy such problems.

Advice Notes

1. The consent holder is advised that should he/she/it wish to transfer this permit to any other person he/she/it must do so by advising the Council in writing in accordance with Section 135(1)(a) of the Resource Management Act 1991. A fee is payable at the time of transfer to cover the cost of administration.
2. The consent holder is advised that he/she/it is required to comply with all relevant provisions of the Building Act 1991, prior to commencing work.
3. The consent holder is referred to Section 125 of the Resource Management Act 1991, which provides for the lapsing of a consent two years after the commencement date, if it is not given effect to within that period.
4. The consent holder is referred to Section 124 of the Resource Management Act 1991, which provides for the exercising of a consent while applying for a new consent.
5. The consent holder shall pay to the Council any administrative charge fixed in accordance with s.36(1) of the Resource Management Act 1991, or any additional charge required pursuant to s.36(3) of the Resource Management Act 1991, payable in respect of this resource consent.

This Consent has been granted by the Auckland Regional Council pursuant to the Resource Management Act 1991. The date of commencement of this consent is determined by Section 116 of the Resource Management Act 1991, unless a later date is stated as a condition of this consent. The provisions of Section 116 of the Resource Management Act 1991 are summarised in the covering letter issued with this consent.

**Ian Mayhew
Manager
Land and Water Quality Section
Auckland Regional Council**

Per: 

Date: 11/6/99

APPENDIX D

ENGINEERING REPORT

FOR

**SANDSPIT MOTOR CAMP
ONSITE WASTE DISPOSAL**

ENGINEERING REPORT
FOR
SANDSPIT MOTOR CAMP
ONSITE WASTE DISPOSAL

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Colin Ashby Consulting.

Structural, Civil, & Geotechnical Engineering.

PO Box 124 Warkworth
Rodney District. N.Z.

Ph. 09 425 94 22 , Fax 09 425 94 31
Mobile 025 94 96 94

Job No 1939
ca/lc/dp

12 November 1998

Mr Brian Morrison
Sandspit Motor Camp
Sandspit Road
RD 2
WARKWORTH

Dear Mr Morrison

Re: SANDSPIT MOTOR CAMP ONSITE WASTE DISPOSAL

As requested, I have carried out a review of the onsite waste disposal at the Motor Camp. I record that I visited the site on Wednesday 21 October 1998 and reviewed the setup with yourself.

Auckland Regional Council Concerns

A copy of a letter dated 15 October 1998 addressed to you from the Auckland Regional Council is appendix hereto. In summary test results show that all the limits with respect to effluent quality are been exceeded consistently.

From the records, it would appear that there have been occasions when the standards for individual constituents have been met. However, I understand that this was more than likely a result of incorrect sampling. For example taking a sample on the down stream side of the ultraviolet light sterilizing unit shortly after the plant had been shut down and the effluent sampled may have been sitting in the ultraviolet unit for some time.

The Consent is due to expire on 31 December 1999 and in its current state, it is extremely unlikely that the permit would be renewed. ARC have requested that a Registered Engineer be engaged and a copy of his report forwarded by Friday 13 November 1998.

Observation

From my observations it would appear that the carry over of suspended solids, from the septic tank and into the rest of the system is the principle cause of the problem. Also the Aeration tanks appear to be incorrectly connected.

Because of the carry over of solids and the incorrect connection of the aeration units, although apparently working hard. The system is not functioning properly and the ultraviolet sterilization unit, because of the turbidity of the effluent, is all but useless.

Septic Tank

The septic tank measures approximately 6.6m long x approximately 2.2m wide x approximately 1.8m deep containing approximately 1.5m depth of effluent.

I understand that the tank has a central dividing wall lengthwise along the tank, effectively providing two chambers. The tank capacity is therefore of the order of 21,000lts. This size does meet the minimum requirements of TP58, however, a larger tank would have been advantageous. It is noted that there is from time to time a need to "muck rake" the silage within the tank to get things moving.

To reduce carry over of solids, it is recommended that an Innoflow standard commercial biotube screen filter, type FT1254, be fitted to the outlet of the septic tank before entering the wet well. It is further recommended that a riser kit be installed above the biotube screen filter to facilitate ease of cleaning.

It is anticipated that such a filter will significantly reduce the carry over of solids into the wet well and improve the quality of effluent quite measurably even though the septic tank is of minimal size.

The use of such a filter may not be a "cure all", but its installation will definitely assist in improving matters.

Wet Well

It is noted that the wet well use is approximately 2m in diameter and the depth between float switches is approximately 1m. It is noted that sometime in the past, one of the float switches failed to operate because of accumulation of fat around the float preventing it from rotating. This would indicate that the desirability of installing a grease trap on the waste pipes leading from the kitchen. It may also prove helpful to educate campers by requiring them to dispose of fat waste in the refuse rather than flushing it down the kitchen sink.

The wet well pump and float switches etc. appear to be reasonably sized and working acceptably.

Aeration

It is acknowledge that you have recently upgraded the aeration units using a larger pump. The aeration units consist of 3 concrete cylindrical towers 1.8mØ, 2.8m high, containing 2.4m depth of effluent and having central blower pipes. When the site was visited, the effluent in the 3 towers was bubbling well and aerating system was functioning, although the effluent was turbid and dark brown.

In carefully studying this system, I believe that it has been set up wrong from the outset and that the least treated effluent is short circuiting the system and finding its way into the clarifier.

Referring to the attached plan it would appear that raw effluent is directed into aeration tank No.3 instead of tank No.1. From aeration tank No.3 there is a direct connection to the clarifier. Thus aeration tanks No.1 & 2 become isolated satellite tanks serving very little useful purpose.

I would recommend that the raw effluent line be redirected to aeration tank No.1 and the valve from tank No.1 to No.3 are closed.

The flow path should be:

Wet well → Aeration tank No.1 → Aeration tank No.2 → Aeration tank No.3 → Clarifier → via top outlet to UV Sterilizer / or via bottom outlet to Aeration tank No.1 → etc.

Clarifier Unit

Following the aeration tower is a clarifier unit stilling tower, where small suspended solid particles gravitate out of suspension and then are syphoned off from the bottom of the tank back to the No.1 aeration tank by air venturi action within the clarifier outlet pipe. Clarified effluent from the top of the clarifier unit, is drawn off via a centrally located "V" notched weir dish via an outlet pipe to then pass through an ultraviolet light sterilizing unit.

With respect to the clarifier unit, it is noted that there is concern with respect to mosquito breeding during the summer. It is suggested that a summer house/turret type structure be constructed over the clarifier tower. The roof to be waterproof and mosquito proof with netted covered walls and door. It would be a challenge to construct and make mosquito proof, particularly around the walkway and door, but not impossible.

UV Sterilization

The UV sterilizer used is a "Steriflo" model 1000S unit with a treatment capacity of clear water of 6000 to 10,000 litres per hour.

This equates to 100 to 167ℓ/min, which should be more than sufficient, providing the turbidity of the effluent can be reduced. The peak discharge 18m³ per day over a 12 hour period equates to 25ℓ/min.

Effluent Discharge

After UV Sterilization, effluent can either be discharged directly to the estuary as per the discharge consent or to a PVC storage tank of approximately 1800lt capacity. From this, it is pumped within the site up a hill to a 2700lt tank with a dosing syphon. From the syphon tank, the syphoned discharge loads a network of RAMM drip irrigation lines feeding an olive tree orchard.

It is anticipated that with a biotube filter and grease trap installed, the quality of effluent will improve markedly, however, it may possibly still not reach the standards required to meet the discharge consent. There may be a need for further plant upgrading, possibly including a sand contact filter at the outlet of the clarifier unit stilling chamber and prior to the ultraviolet light treatment.

In my view it would be prudent to utilize the irrigation system which has been set up rather than discharge to the estuary. Because of the quantity of effluent involved, a discharge consent for this alternative irrigation system will be required, however, it is much more likely to be granted than for a discharge direct to the estuary, particularly since the Resource Management Act came into force.

Whichever method is used, there is a need to scrub up the quality of the effluent, as in time the drip irrigation system will fail to function if there are too many suspended solids carried over.

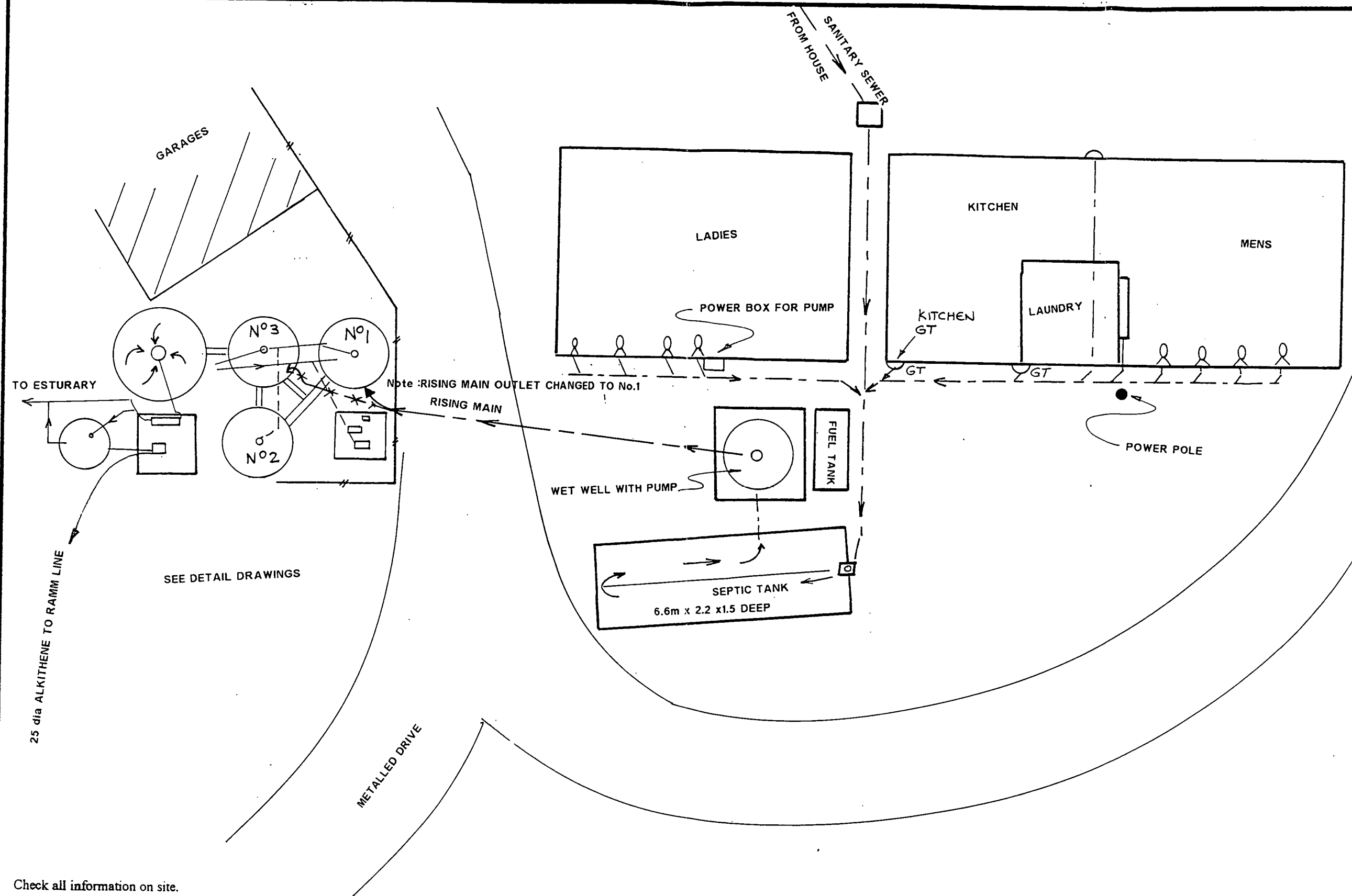
Conclusion and Recommendations

1. Erect signs in the kitchen advising campers not to dispose of fats or chemicals down the waste water system.
2. Fit a grease trap between the kitchen waste and the septic tank.
3. Although the existing septic tank is of minimum size for the peak volume at the height of the season, it may prove satisfactory providing a standard commercial biotube screen filter type FT1254 is fitted to the tank outlet.
4. The raw effluent outlet to be redirected to Aeration tank No. 1 and that the valve between tanks 1 & 3 to be closed.
5. It is suggested that the top of the clarifier unit stilling chamber should be roofed and walled in such a way as to prevent ingress of mosquito.
6. A consent to discharge to land will be required with respect to the very good irrigation setup which you have established. This is considered as a superior discharge system, rather than discharge to the estuary as per the existing discharge consent.
7. The quality of effluent following the recommended upgrade should be monitored and if necessary the septic tank size increased and/or a sand contact filter place between the clarifier unit stilling chamber and the ultraviolet light unit, so as to enhance effluent quality. However, it is anticipated that if the upgrades as specified are carried out, that the effluent quality targets set will be achieved.

Yours faithfully



Colin W. Ashby
MIPENZ. BE. NZCE. Reg. Eng.



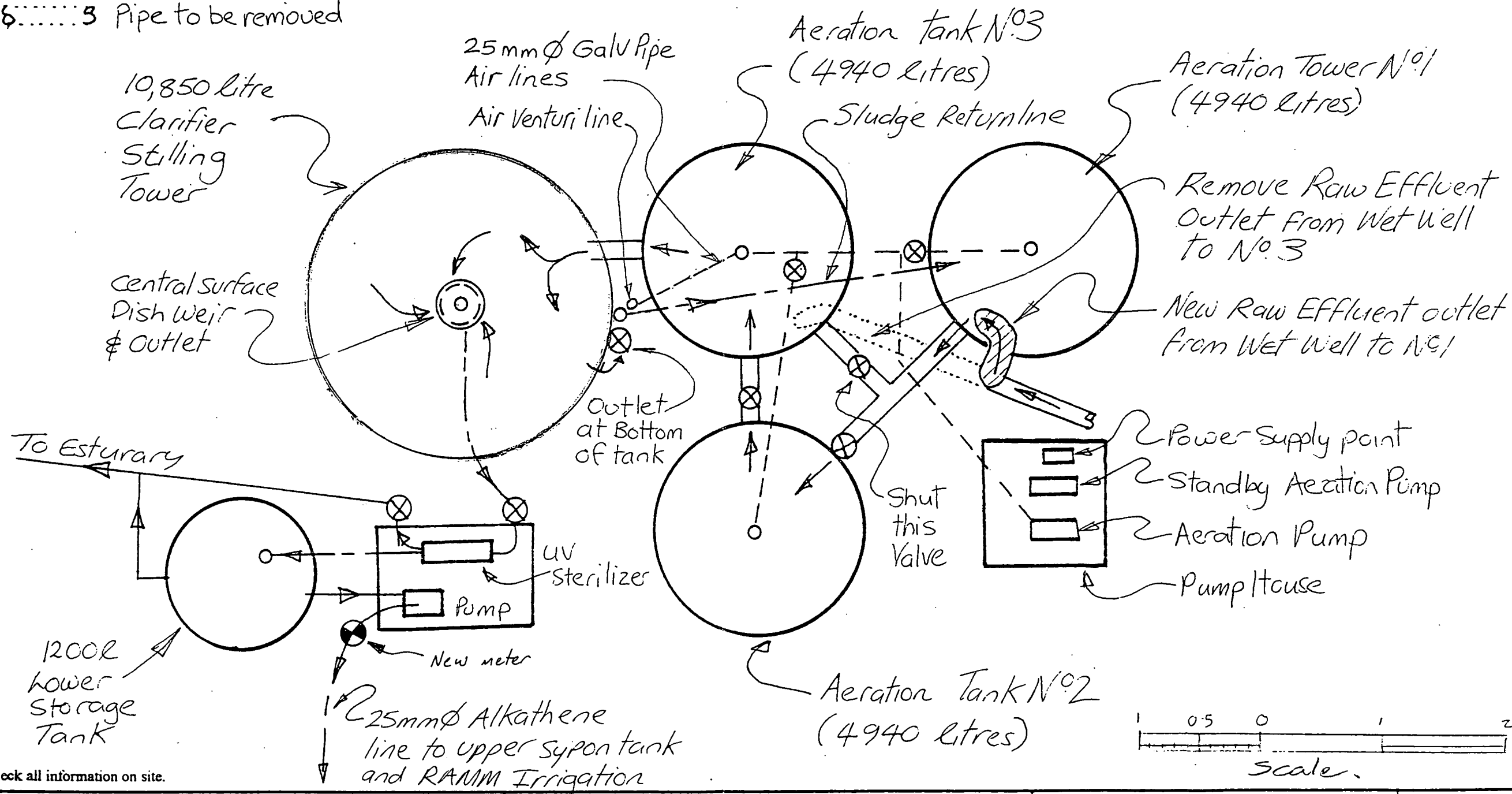
Check all information on site.

Key

----- Air line

----- Effluent Line

⋯⋯⋯ Pipe to be removed



Colin Ashby Consulting.
Structural, Civil, & Geotechnical Engineering
P.O. Box 124 Warkworth,

**SANDSPIT MOTOR CAMP
ON SITE WASTE WATER
TREATMENT PLANT**

Plan No. 1939

Scale :

Drawn :

Date : 11/98

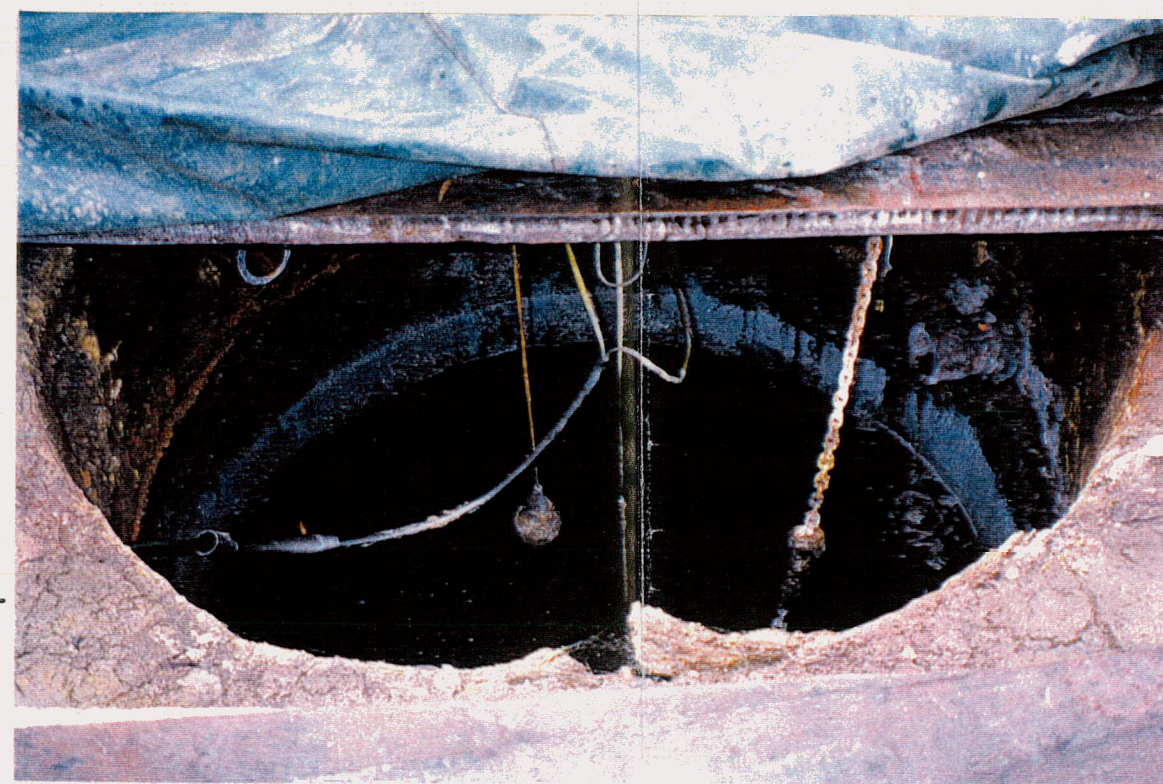
Sheet. 2 R1

Series of



OUTLET FROM
SEPTIC TANK
INTO WET WELL
PUMPING CHAMBER

WET WELL
PUMPING
CHAMBER



AERATOR PUMP
AND AERATION
TOWER

5000 LITRE
AERATION
TOWERS



Check all information on site.



Colin Ashby Consulting.

Structural, Civil, & Geotechnical Engineering

P.O. Box 124 Warkworth,

Ph / Fax 09 425 94 22, Mobile 025 94 96 94

**SANDSPIT MOTOR CAMP
ON SITE WASTE WATER
TREATMENT PLANT**

Plan No. 1939

Scale :

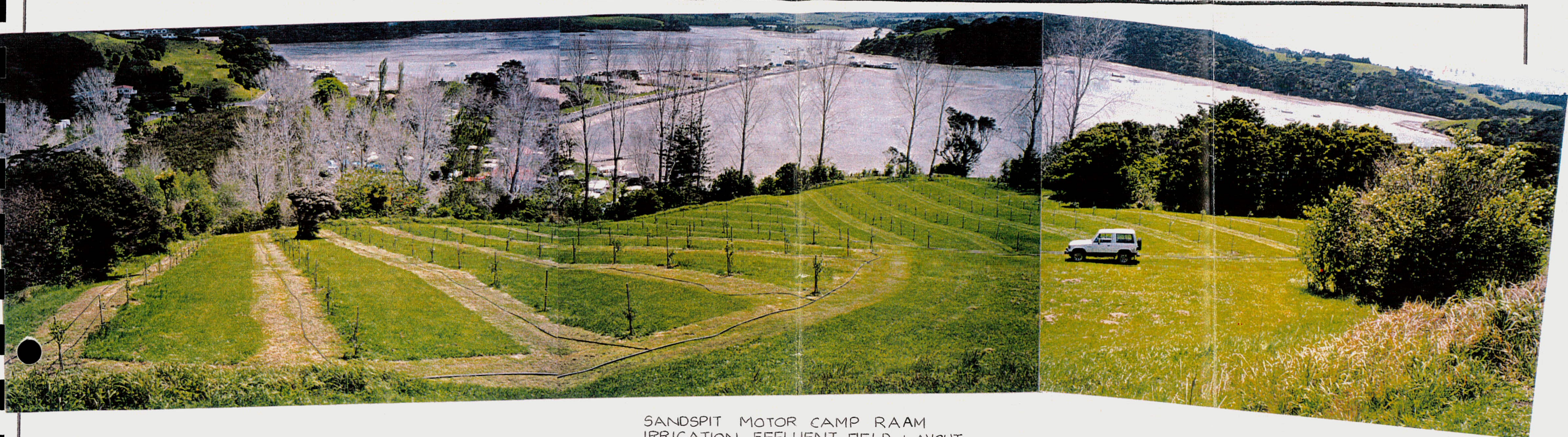
Drawn :

Date : 11 / 98

Sheet.

3

Series of



SANDSPIT MOTOR CAMP RAAM
IRRIGATION EFFLUENT FIELD LAYOUT



1800 LITRE
LOWER HOLDING
TANK PRIOR TO
PUMPING TO UPPER
SYPHON DOSING TANK

2100 LITRE
UPPER SYPHON
DOSING TANK



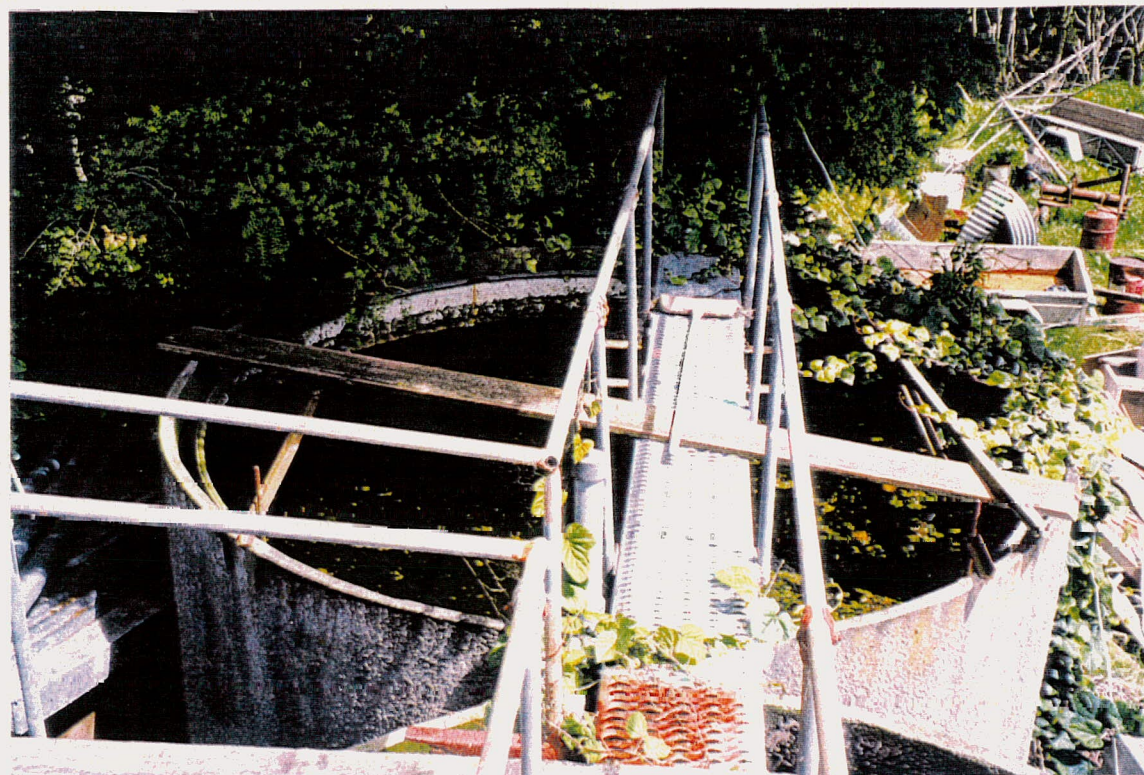
Check all information on site.



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**SANDSPIT MOTOR CAMP
ON SITE WASTE WATER
TREATMENT PLANT**

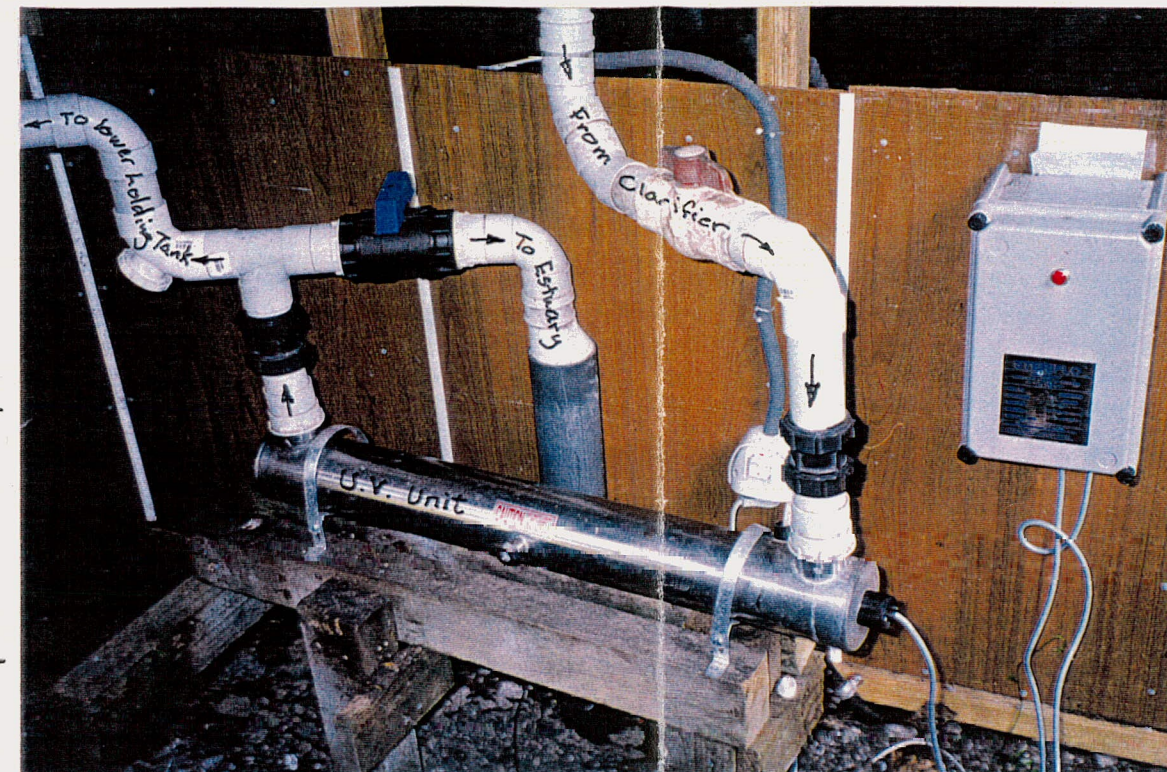
Plan No. 1939		Sheet. 5
Scale :		
Drawn :	Date : 11/ 98	Series of



10,850 LITRE
CLARIFIER
STILLING TOWER

STERIFLOW
MODEL 1000S
(100-160 l/MIN
CAPACITY WITH
CLEAR WATER)

ULTRA VIOLET
LIGHT
STERILISATION
UNIT



ONGA OJ 5700 1500 W
PUMP FROM LOWER
HOLDING TANK TO
UPPER SYPHON DOSING
TANK

Check all information on site.



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**SANDSPIT MOTOR CAMP
ON SITE WASTE WATER
TREATMENT PLANT**

Plan No. 1939

Scale :

Drawn :

Date : 11/98

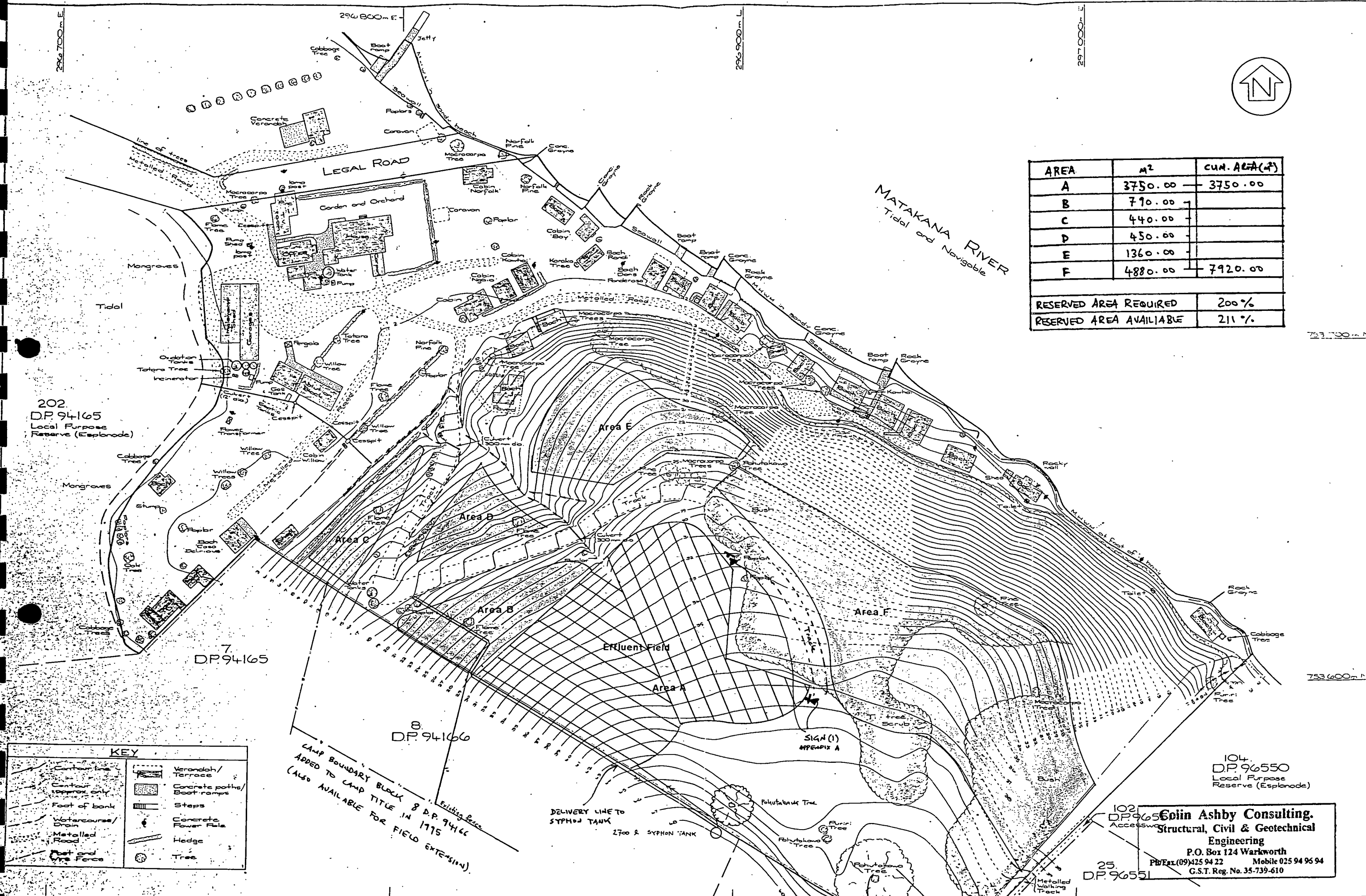
Sheet.

4

Series of

APPENDIX E

**Plan of existing effluent field, and
the reserved area for future
effluent field expansion.**



AREA	m ²	CUM. AREA (m ²)
A	3750.00	3750.00
B	790.00	
C	440.00	
D	450.00	
E	1360.00	
F	4880.00	7920.00
RESERVED AREA REQUIRED		200%
RESERVED AREA AVAILABLE		211%

KEY	
Contour line	Verandah/Terrace
Contour approx. only	Concrete paths/Boat ramps
Foot of bank	Steps
Watercourse/Drain	Concrete Power Pole
Metalled Road	Hedge
Foot and Fire Force	Tree

PREPARED FOR
E.B. AND S.P. EVANS
COMPRISED IN C.T. 878/220 LTD.
AREA 4.1480 ha.

TOPOGRAPHICAL PLAN OF PART ALLOTMENT 23 PARISH OF MAHURANGI SANDSPIT MOTOR CAMP

20
DP 96551

R.H. BUCKTON Registered Surveyor Warkworth		SHEET 2063
DRAWN K. Taylor	CHECKED	SCALES 1:1000
TRACED K. Taylor	DATE May 1981	SERIES OF REF

104 DP 96550
Local Purpose Reserve (Esplanade)

102 DP 96551
Accessway

25 DP 96551

Golin Ashby Consulting.
Structural, Civil & Geotechnical Engineering
P.O. Box 124 Warkworth
Ph/Fax (09) 425 94 22 Mobile 025 94 96 94
G.S.T. Reg. No. 35-739-610