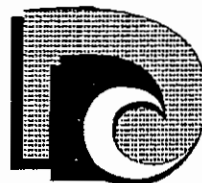


AUPOURI PENINSULA WATER RESOURCES ASSESSMENT

1991

References and Appendices

**NORTHLAND
REGIONAL
COUNCIL**



CARING FOR NORTHLAND AND ITS ENVIRONMENT

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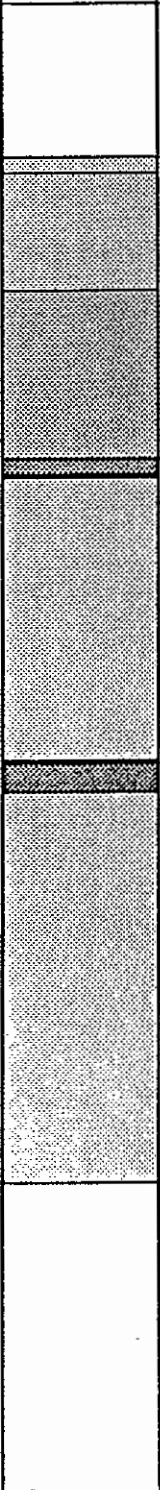
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Name : Hukatere		NRC Welarc No. 48		
Coords : N3:197017		R.L. Ground Level 22.87m		
Location : Hukatere		R.L. Top of casing 24.10m		
GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
fine sand S.W.L.>>		0	150 mm spiral welded casing to 18.8m ss screen 18.8-20.5m	Discharge 2300 gph
iron pan		10		
fine sand		20		
iron pan		30		
sand with thin pans		40		
sand		50		
		60		
		67		
Driller : Logged By :		Start End	PROJECT N.Z. Geological Survey Kaitaia Oct. 1975	

Name : Ogle Drive
 Coords : N4:286898
 Location : Awanui

NRC Wellarc No. 81
 R.L. Ground Level 35.65m
 R.L. Top of casing 36.85m

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
sand iron pan fine sand lignite sand, clay and iron pans lignite S.W.L. >> sand lignite sand		0 10 20 30 40 50 60 68	150mm spiral welded casing to 31.2m. ss screen 31.2-32.1m	Discharge 340 gph
Driller : Logged By :	Start End	PROJECT N.Z. Geological Survey Kaitia Oct. 1975		

NRC Welarc no. 157

PROJECT Aupouri

Name : Flood

Coords : 04:356869

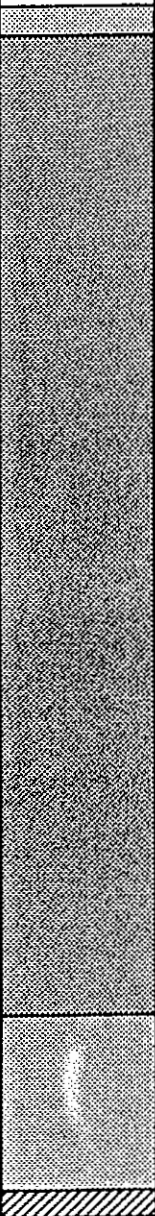
Location : Awanui

NRC Welarc no. 165

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
S.W.L.>> marine clays,peat beds and sands limestone with odd sandstone bands limestone moderately fractured limestone very fractured		0 20 40 60 80 100 106	100mm pvc casing to 23m	discharge 1200gph
Driller : Kiwi Logged By : Snow	PROJECT Aupouri Start End 31.5.85			

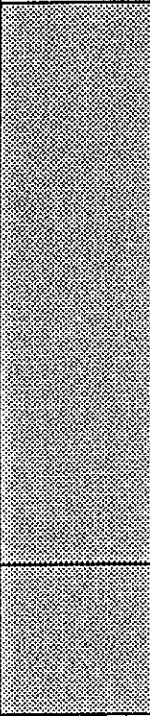
Name : Stanisich
 Coords : N4:286958
 Location : Waiharara

NRC Welarc no. 192

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
timber and topsoil S.W.L.>> dune sands interspersed with peat beds pipi shell bed mudstone		0 20 40 60 80	150mm pvc casing to 66m, 150mm ss screen to 74m	discharge 25000 gph
Driller : Kiwi Logged By : Snow	Start End 23.5.86 PROJECT Aupouri			

Name : Seymour
 Coords : N3:256016
 Location : Waiharara

NRC Welarc no. 197

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
S.W.L. >> dune sands sand with three shell beds		0 20 40 60 80 96	100mm pvc casing grouted to 76m, three 100mm by 3m screens	discharge 5000gph
Driller : Kiwi Logged By : Snow	PROJECT Aupouri Start End 20.10.87			

Name : Noosa Orchards

Coords : N4:291886

Location : Paparore

NRC Welarc no. 205

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
yellow brown sand S.W.L. >> peat and timber yellow grey sand shell bed approx 50% shell grey siltstone greywacke		0 20 40 60 80 100	150mm casing to 90m, ss screen to 96.5m	discharge 12000 gph
Driller : Kiwi Logged By : K.B.		PROJECT Aupouri Start End 10.9.87		

Name : Burnage Rd.

Coords : N3:225071

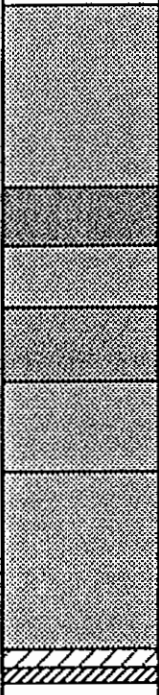
Location : Houhora

NRC Welarc no. 209

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
brown fine sand green-grey silt,peat S.W.L.>> @ 100m grey-brown silty fine sand,peat light grey silty fine sand,peat brown carbonaceous sand,peat grey-green silty fine sand ,peat grey fine sand with shell,peat,and gravel light green clayey silt basement		0 20 40 60 80 100	four 25mm pvc piezos set from 17-20m 36-39m 80-83m 97-100m	RL 23.5m
Driller : Kiwi Start 9.1.87 Logged By : WJR End 15.1.87			PROJECT Aupouri	

Name : Fitzwater
 Coords : N4:300905
 Location : Paparore

NRC Welarc no. 211

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
yellow brown S.W.L.>> sand grey black sand with peat yellow sand grey silty clay grey sand grey sand with shell and gravel grey mud basement		0 20 40 60 80 90	150mm pvc casing to 73m ,ss screen to 79m	discharge 9000 gph
Driller : Kiwi Start 2.2.87 Logged By : GGS End 5.2.87	PROJECT Aupouri			

Name : Karikari

Coords : 03:447022

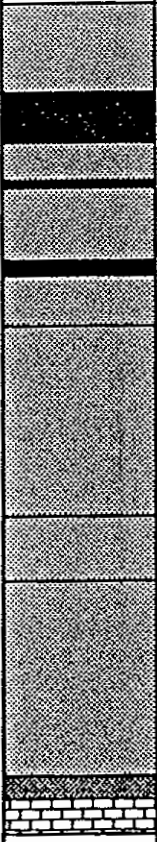
NRC Welarc no. 220

Location : Karikari

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
peat and marine marl, traces of shell, two 0.5m gravel beds S.W.L. >> greywacke		0 20 40 60 80 100 122	100mm pvc casing to 57.5m, 75mm slotted pvc to 122m	discharge 2400gph
Driller : Kiwi Logged By : Snow	Start End 28.9.88 PROJECT Aupouri			

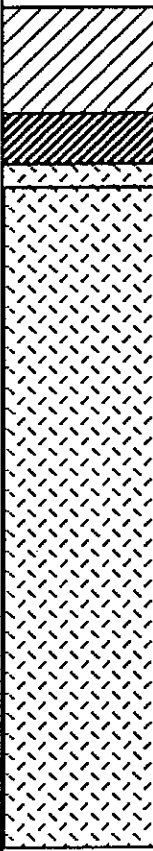
Name : Lake Heather
 Coords : N4:285834
 Location : Sweetwaters

NRC Welarc no. 226

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
yellow brown fine sand peat grey fine sand peat S.W.L. >> @ 100m peat orange brown fine sand more compacted dark green fine sand light grey fine sand, minor shell shell bed approx. 50% shell limestone		0 20 40 60 80 100 105	three 25mm pvc piezos set from 26-29m 59-62m 102-105m	RL 31.65m
Driller : Kiwi Start 23.3.88 Logged By : GGS End 6.4.88.	PROJECT Aupouri			

Name : Te Hapua
 Coords : N2:016428
 Location : Te Hapua

NRC Welarc no. 235

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
clay S.W.L. >> shear zone weathered basalt basalt with minor quatz veins		0 20 40 60 80 100 113	Exploratory bore.Abandoned.	Discharge 50 gph
Driller : GHK Logged By : G.Skuse	Start 13.5.91 End 16.5.91 PROJECT Aupouri			

Name : Sweetwaters		NRC Wellarc No. 1025		
Coords : N4:313846		R.L. Ground Level 3.98m		
Location : Awanui		R.L. Top of casing 7.78m		
GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
S.W.L.>> clay sand peat and wood fine sand iron pan fine sand peat and wood fine sand and silt		0 10 20 30 34	100mm galvanised casing to 27m.ss screen 27.5-30.5m	Discharge 2750 gph
Driller : Start Logged By : End		PROJECT N.Z. Geological Survey Kaitia Oct. 1975		

Name : Ahipara
 Coords : N4:249703
 Location : Ahipara

NRC Welarc no. 1307

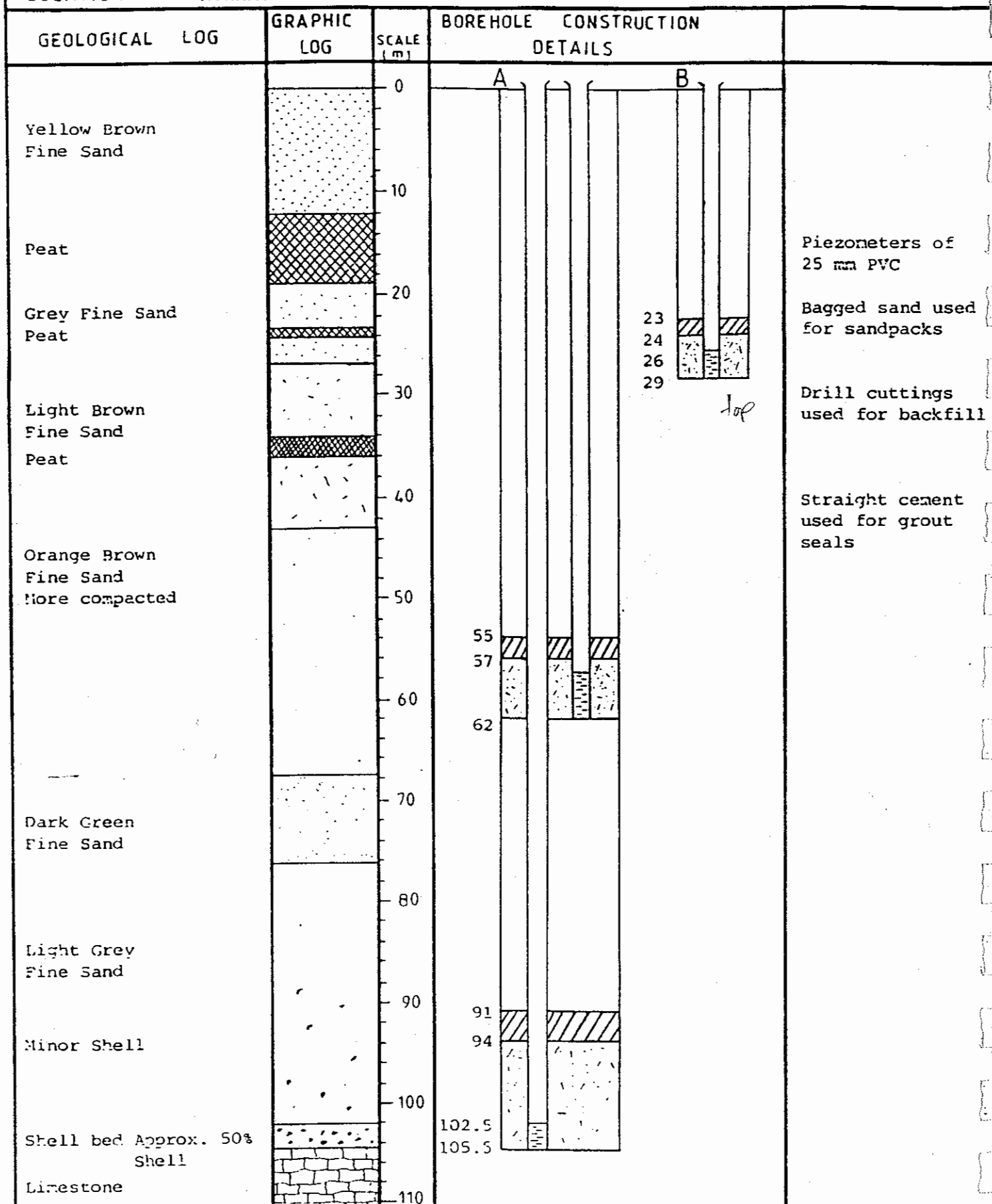
GEOLOGICAL LOG	GRAPHIC LOG	SCALE (M)	BOREHOLE CONSTRUCTION DETAILS	
surface fill and peat sands S.W.L.>> coarse sands very matrixed gravel sands,no aquifers		0 20 40 60 80 100 114	100mm pvc casing to 21m,ss screen to 23m	discharge 240 gph
Driller : Kiwi Start Logged By : Snow End 7.10.88			PROJECT Aupouri	

HOLE No. / NAME LAKE HEATHER No. 1
 CO-ORDINATES No 4 285834
 LOCATION Sweetwaters, Awanui

Appendix 2.0

144

NRC Wellarc No. 226
 RL Ground level (a)31.65 (b)31.77
 RL Bore Cap (a)32.32 (b)32.47



DRILLER Snow Brown

START 23.3.83

LOGGED BY G Skuse

FINISHED 6.4.83

PROJECT:- SWEETWATERS
 INVESTIGATION DRILLING

NORTHLAND REGIONAL
 COUNCIL

DATE

DRAWING No

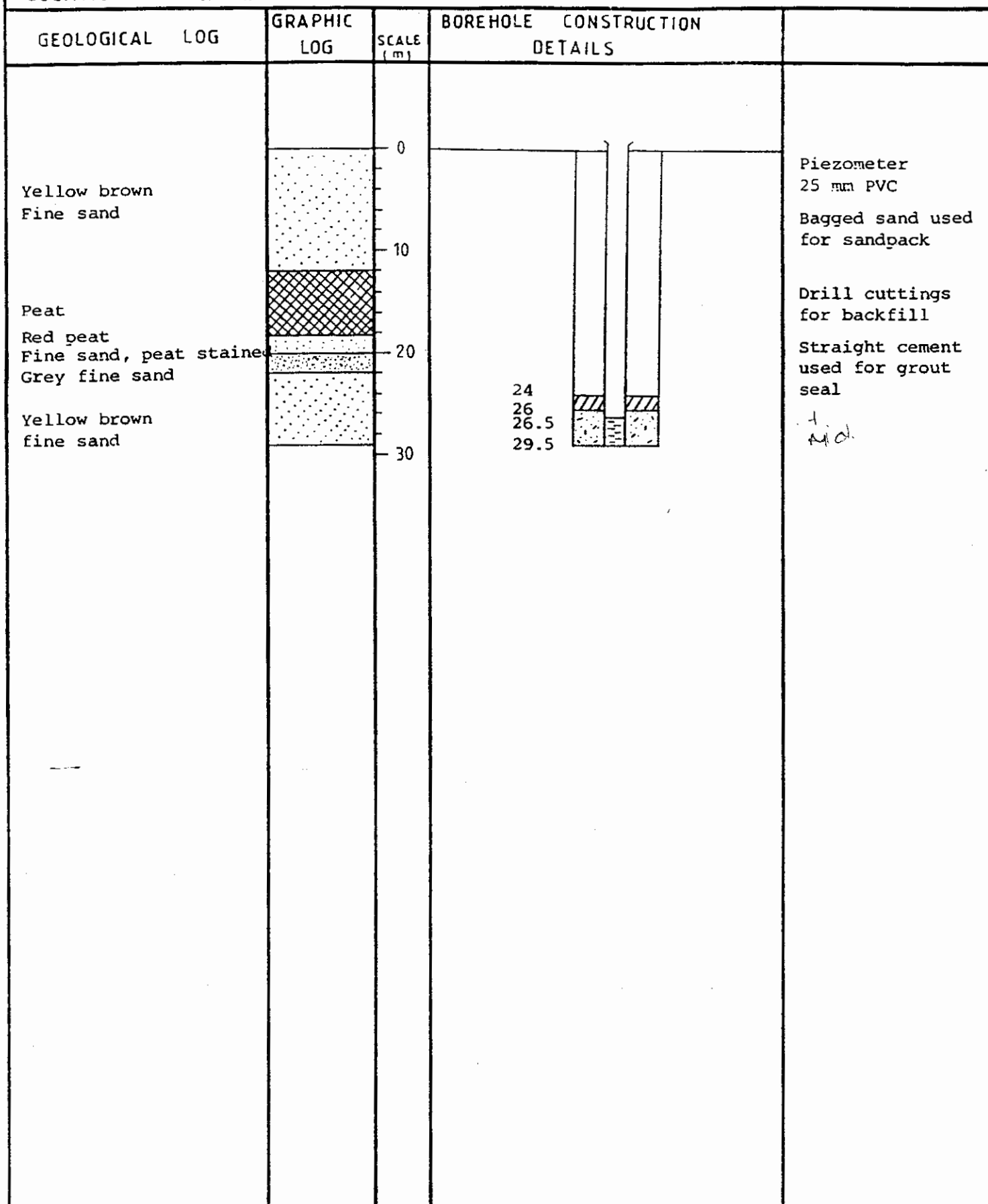
FIGURE No

HOLE No. / NAME Lake Heather No 2
CO-ORDINATES No 4 284835
LOCATION Sweetwaters, Awanui

Appendix 2 contd.

145

NRC Wolarc No. 227
RL Ground level 35.75
RL Bore Cap 36.83



DRILLER Snow Brown START 6.4.88
LOGGED BY G Skuse FINISHED 7.4.88

PROJECT:- SWEETWATERS
INVESTIGATION DRILLING

NORTHLAND REGIONAL
COUNCIL

DATE -

DRAWING No

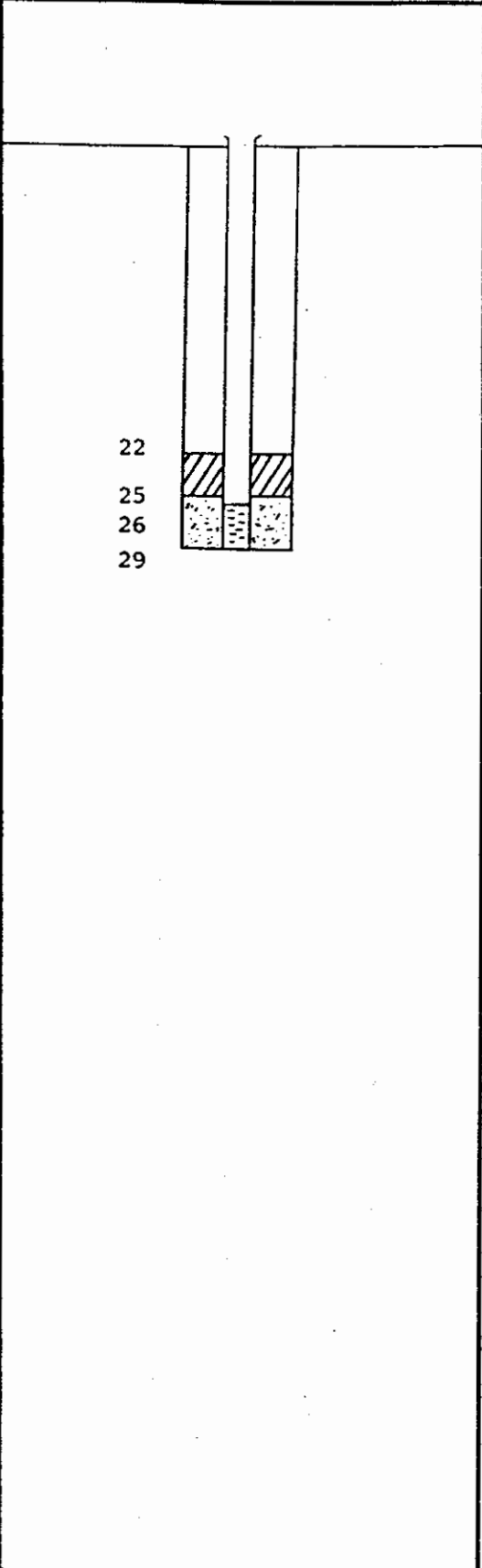
FIGURE No

HOLE No. / NAME Lake Heather No. 3
CO-ORDINATES No 4 286837
LOCATION Sweetwaters, Awanui

Appendix 2 contd.

146

NRC Wellbore No. 228
RL Ground level 33.40
RL Bore Cap 33.95

GEOLOGICAL LOG	GRAPHIC LOG	SCALE (m)	BOREHOLE CONSTRUCTION DETAILS	
Yellow brown fine sand Peat Grey fine sand		0 10 20 30	 22 25 26 29	Piezometer 25 mm PVC Bagged sand used for sandpack Drill cuttings used for backfill Straight cement used for grout <i>W. Skuse</i>
DRILLER Snow Brown LOGGED BY G Skuse	START 7.4.88 FINISHED 7.4.88 PROJECT:- SWEETWATERS INVESTIGATION DRILLING			
NORTHLAND REGIONAL COUNCIL			DATE -	DRAWING No FIGURE No

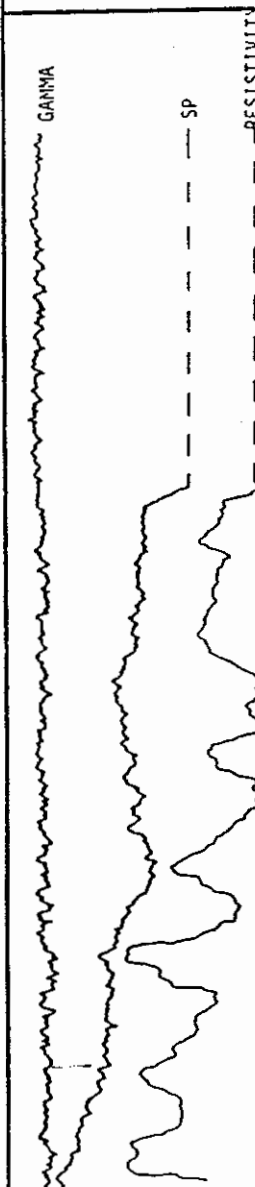
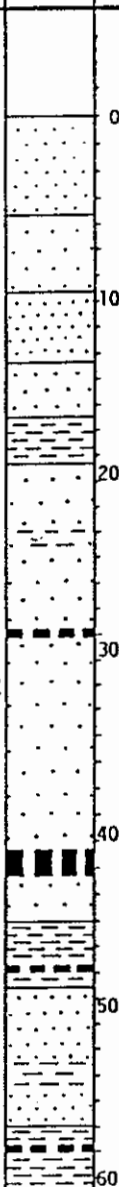
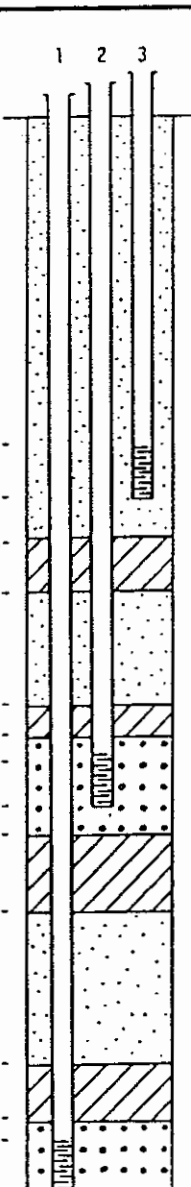
HOLE No.
CO ORDINATES
LOCATION

N03: 197017
HUKATERE ROAD

Appendix 2 contd.

147

NRC Wellarc No. 206
RL Ground level 23.37
RL Bore Cap 23.97

GEOPHYSICAL LOG	graphic log	scale (m)	Geological Log	Borehole Construction Details	boiling yield and additional observations
			GOLDEN BROWN VF SAND		Piezometers of 25 mm PVC
			WHITISH VF SAND		Bore Backfilled w/natural sands and/or bagged sand
			LIGHT GREY-GREEN VF SAND		
			WHITISH SILTY VF SAND		
			ORANGE CLAY WITH VF SAND		
			LIGHT BROWN SILTY VF SAND		
			- Orange Iron Staining, some clay		Straight cement used for grout seals
			- Peat		
			- Clean, Well-Sorted Sands		
			- Rock Fragments, some Mica		
			- Carbonaceous Silt		
			BANDED ORANGE, WHITE & GREY CLAYS W/CARB MATERIAL		
			LIGHT BROWN SILTY VF SAND		
			- Yellow-White Clays		
			- Some Mica		
			GREEN-GREY CLAY, SOME CARBONACEOUS MATERIAL		

DRILL TYPE .Mud Rotary.....
FEED
DRILLER .Kiwit Welldrillers.....
COMMENCED ..6.1.87.....
COMPLETED ..9.1.87.....
LOGGED BY .WJR.....
CHECKED BY
VERTICAL SCALE

KEY

water
10.01.80
water level and date
water inflow
water outflow

CLIENT :

NORTHLAND CATCHMENT COMMISSION
AND REGIONAL WATER BOARD

PROJECT :

GROUNDWATER INVESTIGATION
LOG OF BORE

GROUNDWATER CONSULTANTS
(N.Z.) LTD.

DATE

DRAWING NO

FIGURE NO

DRILL TYPE Mud Rotary FEED DRILLER Kiwi Well-drillers COMMENCED 15.12.86 COMPLETED 19.12.86 LOGGED BY MMR CHECKED BY VERTICAL SCALE		<u>KEY</u>  <u>water</u> 10.01.80 water level and date water inflow water outflow	
CLIENT : NORTHLAND CATCHMENT COMMISSION AND REGIONAL WATER BOARD		PROJECT : GROUNDWATER INVESTIGATION LOG OF BORE	
GROUNDWATER CONSULTANTS (N.Z.) LTD.		DATE :	DRAWING NO
			FIGURE NO

FIGURE NO

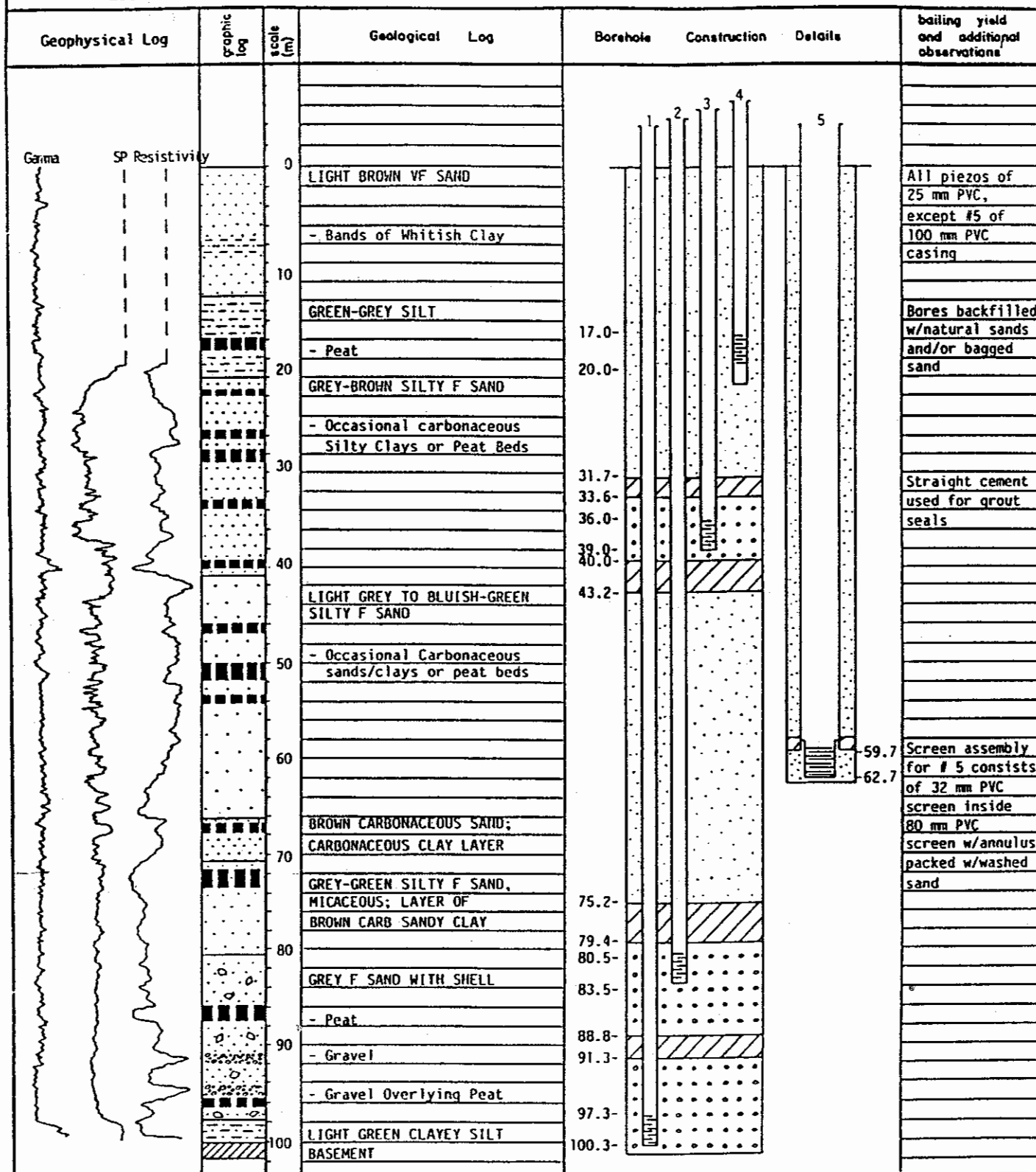
HOLE No.
CO ORDINATES
LOCATION

4
N03: 225071
BURNAGE ROAD

Appendix 2 contd.

150

NRC Welarc No. 209'
RL Ground level 23.50'
RL Bore Cap 24.10



DRILL TYPE Mud Rotary
FEED
DRILLER Kiwi Welldrillers
COMMENCED 9.1.87
COMPLETED 15.1.87
LOGGED BY NJR
CHECKED BY
VERTICAL SCALE

KEY

water
10.01.80
water level and date
water inflow
water outflow

CLIENT :

NORTHLAND CATCHMENT COMMISSION
AND REGIONAL WATER BOARD

PROJECT :

GROUNDWATER INVESTIGATION
LOG OF BORE

GROUNDWATER CONSULTANTS
(N.Z.) LTD.

DATE :

DRAWING NO

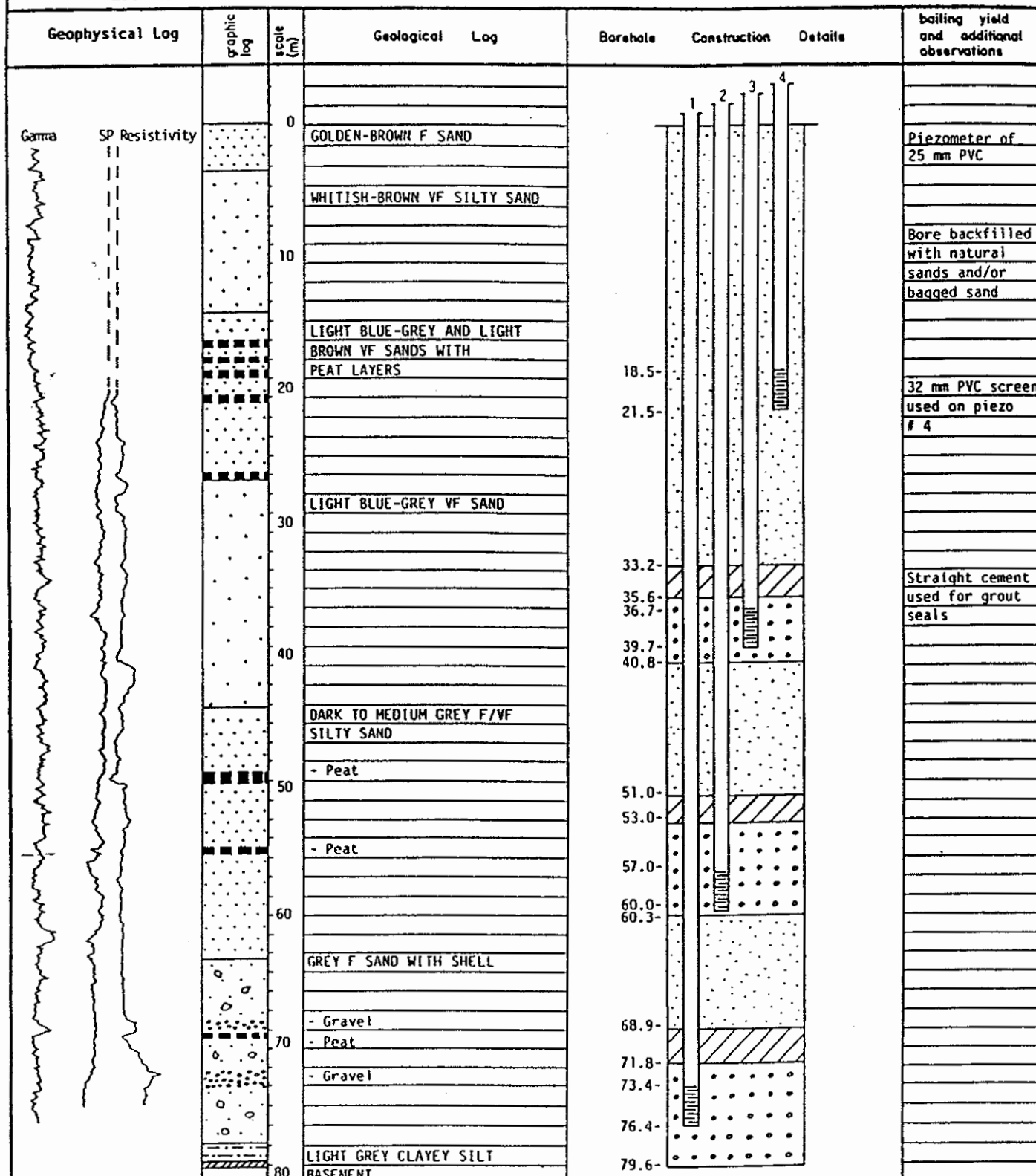
FIGURE NO.

5.
NO3: 226089
WATERFRONT, ROAD

Appendix 2 contd.

151

NRC Well No. 210
RL Ground level 12.50
RL Bore Cap 13.00



DRILL TYPE	Mud Rotary
FEED	
DRILLER	Kiwi Well-drillers
COMMENCED	16.1.87
COMPLETED	19.1.87
LOGGED BY	MMR
CHECKED BY	
VERTICAL SCALE	

KEY

water

10.01.80
water level and date

water inflow

water outflow

CLIENT :

NORTHLAND CATCHMENT COMMISSION
AND REGIONAL WATER BOARD

PROJECT :

GROUNDWATER INVESTIGATION
LOG OF BORE

GROUNDWATER CONSULTANTS
(N.Z.) LTD.

DATE _____

DRAWING NO

FIGURE NO

Date	Drawing No	Figure No.
------	------------	------------

Appendix 3.0: Aupouri and Karikari peninsulas, physical and chemical results of lake sampling

Lake	Rotokawau	Rotokawau	Rotokawau	Rotokawau	Rotokawau	Rotokawau
Site no	NLD001928	NLD000432	NLD000676	NLD000676	NLD000676	NLD001928
Site location	E. end	W. end	(composite)	Centre	Centre	E. end
Date	12-Aug-1987	12-Aug-1987	12-Aug-1987	22-Feb-1989	09-Aug-1989	21-Jan-1991
Time (NZST)	14:10	14:20		11:35	09:50	12:05 hrs
Chlorophyll <i>a</i>	-	-	-	<0.002	0.007	0.078 g/m ³
Secchi	>1.6	>1.0		1.15	1.05	0.41 m
Depth	1.6	1.0		1.5	1.75	1.1 m
Faecal coliforms	2	4		12	140	130 n/100ml
Faecal Streps.	2	4		6	-	- n/100ml
Dissolved oxygen	8.2	7.5		8.5	8.4	9.5 g/m ³
Temperature	14.7	14.4		20.0	15.0	24.0 Deg.C.
pH	-	-		9.5	6.23	9.4 pH
Conductivity	26.1	26.3		27.0	16.7	28.0 mS/m @25Deg.C.
Alkalinity - bicarbonate			0.2	1.5	<2.0	5.5 g/m ³ HCO ₃
Alkalinity - total			0.2	1.2	<2.0	4.5 g/m ³ CaCO ₃
Alkalinity - carbonate			0.0	0.0	0.0	0.0 g/m ³ CO ₃
Hardness - calcium			6.6	6.0	4.7	12.1 g/m ³ CaCO ₃
Hardness - magnesium			23.3	15.6	10.7	21.1 g/m ³ CaCO ₃
Hardness - total			29.9	21.6	15.4	33.2 g/m ³ CaCO ₃
Calcium			2.64	2.40	1.90	4.80
Magnesium			5.66	3.80	2.60	5.10 g/m ³
Iron - total			<0.02	0.03	0.06	0.15 g/m ³
Potassium			3.32	2.92	2.22	3.00 g/m ³
Sodium			45.2	30.0	20.8	36.0 g/m ³
Chloride			76.0	254.0	36.0	65.6 g/m ³
Silica			0.35	0.70	1.70	0.80 g/m ³
Sulphate			17.0	11.5	7.3	13.4 g/m ³
Diss. Reactive Phosphorus			<0.001	<0.01	0.054	0.029 g/m ³
Ammoniacal nitrogen			<0.001	<0.01	0.038	0.097 g/m ³
Nitrite/nitrate nitrogen			-	<0.002	0.012	0.061 g/m ³
Nitrate nitrogen			0.011	-	-	- g/m ³
Suspended Solids			-	-	-	37 g/m ³
Stratified ?	no	no	-	no	-	no

See notes following tables.

Appendix 3.0: contd.

Lake	Waiporohita	Kihona	Morehurehu	Te Kahika	Salt	Bullrush	Ngakapua	Waimimiha	Forest HQ
Site no	NLD001930	NLD001907	NLD001908	NLD001909	NLD001911	NLD001910	NLD001913	NLD001914	NLD001912
Date	21-Jan-1991	16-Jan-1991	16-Jan-1991	16-Jan-1991	16-Jan-1991	16-Jan-1991	17-Jan-1991	17-Jan-1991	17-Jan-1991
Time (NZST)	13:50	08:35	11:00	11:45	13:15	17:30	09:50	11:30	08:20 hrs
Chlorophyll a	0.004	0.002	<0.001	0.001	0.003	0.019	0.006	0.418	0.004 g/m3
Secchi	>2.8	2.75	-	-	1.4	1.1	1.75	0.23	2.4 m
Depth	2.8	6.0	-	-	3.2	1.3	5.2	1.3	4.9 m
Faecal coliforms	2	2	<1	<1	95	90	10	180	2 n/100ml
Dissolved oxygen	9.5	8.6	9.6	8.7	7.4	10.0	7.6	10.0	3.3 g/m3
Temperature	23.5	23.5	23.5	23.5	24.0	25.0	22.5	21.8	23.25 Deg.C.
pH	8.6	6.7	7.2	6.2	6.5	6.8	6.3	8.7	5.5 pH
Conductivity	15.6	26.4	24.3	32.0	29.5	25.5	21.0	36.7	11.0 mS/m @25Deg.C.
Alkalinity - bicarbonate	24.4	23.5	9.4	4.9	28.9	14.2	10.4	58.6	9.5 g/m3 HCO3
Alkalinity - total	20.0	19.3	7.7	4.0	23.7	11.6	8.5	48.0	7.8 g/m3 CaCO3
Alkalinity - carbonate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 g/m3 CO3
Hardness - calcium	20.9	8.8	5.7	7.8	21.1	13.2	7.9	23.7	5.2 g/m3 CaCO3
Hardness - magnesium	10.1	21.8	19.4	29.6	27.2	22.5	13.8	37.0	8.3 g/m3 CaCO3
Hardness - total	31.0	30.6	25.1	37.4	48.3	35.7	21.7	60.7	13.5 g/m3 CaCO3
Calcium	8.40	3.50	2.30	3.10	8.40	5.30	3.20	9.50	2.10 g/m3
Magnesium	2.50	5.30	4.70	7.20	6.60	5.50	3.40	9.00	2.00 g/m3
Dissolved Iron	<0.02	0.02	<0.02	0.18	0.38	0.68	0.02	1.12	0.16 g/m3
Potassium	2.24	1.46	1.00	0.97	1.07	4.60	6.20	3.20	3.94 g/m3
Sodium	16.4	35.0	27.0	39.0	39.0	39.0	25.0	39.0	13.6 g/m3
Chloride	27.4	54.8	46.8	71.2	72.0	75.6	47.2	65.6	26.8 g/m3
Silica	0.70	4.50	0.10	1.10	5.40	3.00	1.30	12.30	1.90 g/m3
Sulphate	5.4	5.9	4.5	16.9	5.3	4.3	3.6	4.3	0.3 g/m3
Diss. Reactive Phosphorus	<0.01	<0.01	<0.01	<0.01	0.034	0.011	<0.01	0.034	<0.01 g/m3
Ammoniacal nitrogen	0.314	<0.01	0.044	0.645	0.059	0.191	0.017	0.154	0.013 g/m3
Nitrite/nitrate nitrogen	0.018	0.017	0.014	0.019	0.011	0.014	0.013	0.101	0.017 g/m3
Suspended Solids	2	1	1	<1	1	9	3	91	3 g/m3
Stratified ?	no	yes	-	-	yes	no	no	no	yes

Morehurehu - Sampled by swimming, 5m out from reeds.

Te Kahika - Sampled by wading to above knees, sparse reeds.

See notes following tables.

Appendix 3.0: contd.

Lake	Heather	Heather	Heather	Heather	Heather	Heather	Heather	Heather	Heather
Site no	MLD000386	MLD000390	MLD001031	MLD000386	MLD000390	MLD000386	MLD000390	MLD001031	MLD000386
Site location	N. end	S. end	(composite)	N. end	S. end	N. end	S. end	(composite)	N. end
Date	11-Aug-1987	11-Aug-1987	11-Aug-1987	22-Feb-1989	22-Feb-1989	08-Aug-1989	08-Aug-1989	08-Aug-1989	21-Jan-1991
Time (NZST)	13:10	13:30		09:00	09:10	15:48	15:40		09:10 hrs
Chlorophyll <i>a</i>	-	-	-	0.077	-	-	-	0.037	0.009 g/m3
Secchi	1.0	0.8		0.85	0.85	1.15	1.15		1.200 m
Depth	4.1	4.2		5.0	5.3	5.75	6.45		4.500 m
Faecal coliforms	26	54		126	116	32	196		13 n/100ml
Faecal Streps.	<3	<3		16	30	6	12		- n/100ml
Dissolved oxygen	8.6	7.7		6.2	6.3	8.0	8.4		8.1 g/m3
Temperature	14.3	14.0		21.0	21.0	14.0	14.0		22.0 Deg.C.
pH	7.6	7.0		8.1	8.6	-	-	7.15	7.3 pH
Conductivity	20.7	21.5		28.1	28.1	17.7	17.7	-	24.6 mS/m @250deg.C.
Alkalinity - bicarbonate			37.5	40.3				35.3	43.7 g/m3 HCO3
Alkalinity - total			30.7	33.0				28.9	35.8 g/m3 CaCO3
Alkalinity - carbonate			0.0	0.0				0.0	0.0 g/m3 CO3
Hardness - calcium			8.9	11.0				9.3	12.9 g/m3 CaCO3
Hardness - magnesium			23.6	24.6				21.0	24.6 g/m3 CaCO3
Hardness - total			32.5	35.6				30.3	37.5 g/m3 CaCO3
Calcium			3.56	4.40				3.70	5.20 g/m3
Magnesium			5.73	6.00				5.10	6.00 g/m3
Iron - total			0.32	0.01				0.28	0.24 g/m3
Potassium			7.70	8.50				7.80	9.10 g/m3
Sodium			30.0	26.8				23.8	28.0 g/m3
Chloride			56.5	53.0				42.4	49.6 g/m3
Silica			0.47	0.50				1.20	0.40 g/m3
Sulphate			0.96	1.10				<0.5	0.50 g/m3
Diss. Reactive Phosphorus			<0.001	<0.01				0.076	<0.010 g/m3
Ammoniacal nitrogen			<0.001	<0.01				0.028	0.071 g/m3
Nitrite/nitrate nitrogen			-	0.009				0.017	0.013 g/m3
Nitrate nitrogen			0.021	-				-	- g/m3
Suspended Solids			-	-				-	9 g/m3
Stratified ?	no	no	-	no	no	-	-	-	yes

See notes following tables.

Appendix 3.0: contd.

Lake	Ngatu	Ngatu	Ngatu	Ngatu	Ngatu	Ngatu	Ngatu	Ngatu	Ngatu
Site no	NLD000402	NLD000406	NLD001032	NLD000402	NLD000406	NLD000402	NLD000406	NLD001032	NLD000406
Site location	S. end	N. end	(composite)	S. end	N. end	S. end	N. end	(composite)	N. end
Date	11-Aug-1987	11-Aug-1987	11-Aug-1987	21-Feb-1989	21-Feb-1989	08-Aug-1989	08-Aug-1989	08-Aug-1989	21-Jan-1991
Time (NZST)	14:30	14:40		15:20	15:04	16:45	16:40		07:35 hrs
Chlorophyll <i>a</i>	-	-		-	0.004	-	-	0.002	0.001 g/m3
Secchi	>3.6	>3.0		3.15	2.3	3.75	>2.55		2.23 m
Depth	3.6	3.0		3.6	2.5	4.45	2.55		2.30 m
Faecal coliforms	2	16		10	<2	32	52		8 n/100ml
Faecal Streps.	2	<2		14	<2	4	10		- n/100ml
Dissolved oxygen	8.1	7.6		7.6	8.2	8.3	8.7		8.6 g/m3
Temperature	14.6	14.7		22.0	22.0	14.0	14.5		23.5 Deg.C.
pH	-	-		8.9	8.4	-	-	6.95	7.4 pH
Conductivity	17.5	-		21.2	21.7	13.9	13.6	-	19.0 mS/m @25Deg.C.
Alkalinity - bicarbonate			13.4		9.8			8.1	15.4 g/m3 HCO3
Alkalinity - total			11.0		8.0			6.6	12.6 g/m3 CaCO3
Alkalinity - carbonate			0.0		0.0			0.0	0.0 g/m3 CO3
Hardness - calcium			9.1		6.6			5.3	9.3 g/m3 CaCO3
Hardness - magnesium			19.9		17.8			15.5	18.9 g/m3 CaCO3
Hardness - total			29.0		24.4			20.8	28.2 g/m3 CaCO3
Calcium			3.64		2.60			2.10	3.70 g/m3
Magnesium			4.84		4.30			3.80	4.60 g/m3
Iron - total			0.03		<0.02			1.01	<0.02 g/m3
Potassium			3.00		3.02			2.70	3.60 g/m3
Sodium			26.8		23.6			20.0	24.0 g/m3
Chloride			47.8		44.0			32.8	40.0 g/m3
Silica			0.20		0.20			0.66	1.70 g/m3
Sulphate			13.2		13.8			10.5	9.3 g/m3
Diss. Reactive Phosphorus			<0.001		<0.01			0.054	<0.01 g/m3
Ammoniacal nitrogen			<0.001		0.053			0.021	<0.01 g/m3
Nitrite/nitrate nitrogen			-		<0.002			0.015	0.030 g/m3
Nitrate nitrogen			0.177		-			-	- g/m3
Suspended Solids			-		-			-	4 g/m3
Stratified ?	no	no	-	no	no	-	-	-	no

See notes following tables.

Appendix 3.0: contd.

Lake	Rotorua	Rotorua	Rotorua	Rotorua	Rotorua	Rotorua	Rotorua	Rotorua	Rotorua
Site no	NLD000425	NLD000428	NLD000426	NLD000425	NLD000428	NLD000425	NLD000426	NLD000428	NLD000425
Site location	N. end	S. end	Centre	N. end	S. end	N. end	(composite)	S. end	N. end
Date	11-Aug-1987	11-Aug-1987	11-Aug-1987	22-Feb-1989	22-Feb-1989	08-Aug-1989	08-Aug-1989	08-Aug-1989	21-Jan-1991
Time (NZST)	11:15	11:45	11:30	08:25	08:15	14:55		14:50	08:25 hrs
Chlorophyll <i>a</i>	-	-	-	-	0.004	-	0.001	-	<0.001 g/m3
Secchi	>1.7	>2.1	2.6	1.5	1.45	>2.45		2.05	>2.0 m
Depth	1.7	2.1	2.7	1.8	2.00	2.45		3.15	2.0 m
Faecal coliforms	9	10	8	70	176	48		166	8 n/100ml
Faecal Streps.	<1	<1	<1	82	190	4		2	- n/100ml
Dissolved oxygen	7.9	6.9	7.2	7.6	7.6	8.3		8.2	8.0 g/m3
Temperature	14.1	14.1	13.9	21.0	20.5	14.0		14.0	22.0 Deg.C.
pH	6.1	6.6	6.4	7.0	7.1	-	7.04	-	7.1 pH
Conductivity	30.3	27.8	27.9	33.5	33.8	21.5	-	21.5	29.2 mS/m @25Deg.C.
Alkalinity - bicarbonate			20.0		17.1		11.8		14.6 g/m3 HCO3
Alkalinity - total			16.4		14.0		9.7		12.0 g/m3 CaCO3
Alkalinity - carbonate			0.0		0.0		0.0		0.0 g/m3 CO3
Hardness - calcium			11.1		12.5		9.4		11.6 g/m3 CaCO3
Hardness - magnesium			27.2		24.8		21.0		25.8 g/m3 CaCO3
Hardness - total			38.3		37.3		30.4		37.4 g/m3 CaCO3
Calcium			4.44		5.00		3.80		4.60 g/m3
Magnesium			6.61		6.00		5.10		6.30 g/m3
Iron - total			0.06		0.03		0.03		<0.02 g/m3
Potassium			6.60		6.80		5.60		7.00 g/m3
Sodium			40.0		36.0		29.2		36.0 g/m3
Chloride			77.0		75.0		54.4		65.6 g/m3
Silica			0.28		0.20		0.83		1.00 g/m3
Sulphate			12.0		12.3		9.4		12.4 g/m3
Diss. Reactive Phosphorus			0.006		0.050		0.040		<0.01 g/m3
Ammoniacal nitrogen			0.252		0.250		0.045		0.309 g/m3
Nitrite/nitrate nitrogen			-		0.012		0.190		0.022 g/m3
Nitrate nitrogen			0.137		-		-		- g/m3
Suspended Solids			-		-		-		<1 g/m3
Stratified ?	no	no	-	no	no	-	-	-	no

See notes following tables.

Appendix 3.0: contd.

Lake	Wahakari	Wahakari	Wahakari	Wahakari	Wahakari	Wahakari	Wahakari	Wahakari
Site no	MLD000410	MLD000417	MLD001034	MLD000410	MLD000417	MLD000410	MLD000417	MLD001034
Site location	S. end	N.W. end	(composite)	S. end	N.W. end	S. end	N.W. end	(composite)
Date	12-Aug-1987	12-Aug-1987	12-Aug-1987	21-Feb-1989	21-Feb-1989	08-Aug-1989	08-Aug-1989	08-Aug-1989
Time (NZST)	10:15	10:30		11:15	10:40	11:33	11:20	hrs
Chlorophyll <i>a</i>	-	-	-	-	0.008	-	-	0.002 g/m3
Secchi	2.2	2.4		2.35	2.05	2.75	3.39	m
Depth	10.2	9.4		10.5	7.5	9.85	8.2	m
Faecal coliforms	8	9		2	2	8	8	n/100ml
Faecal Streps.	2	2		<2	14	4	<2	n/100ml
Dissolved oxygen	6.5	7.0		7.1	7.6	9.2	9.2	g/m3
Temperature	14.0	14.0		21.5	21.5	14.0	14.0	Deg.C.
pH	-	-		6.9	7.1	6.5	6.8	7.05 pH
Conductivity	16.5	15.2		20.3	19.8	14.6	14.6	- mS/m @25Deg.C.
Alkalinity - bicarbonate			13.9		13.4			11.7 g/m3 HCO3
Alkalinity - total			11.4		11.0			9.6 g/m3 CaCO3
Alkalinity - carbonate			0.0		0.0			0.0 g/m3 CO3
Hardness - calcium			5.5		6.1			5.3 g/m3 CaCO3
Hardness - magnesium			15.4		15.0			14.8 g/m3 CaCO3
Hardness - total			20.9		21.1			20.1 g/m3 CaCO3
Calcium			2.20		2.40			2.10 g/m3
Magnesium			3.74		3.60			3.60 g/m3
Iron - total			0.08		0.37			0.27 g/m3
Potassium			2.12		2.20			2.06 g/m3
Sodium			26.0		23.8			23.0 g/m3
Chloride			46.5		51.0			39.2 g/m3
Silica			5.40		5.00			5.50 g/m3
Sulphate			0.6		4.1			5.0 g/m3
Diss. Reactive Phosphorus			<0.001		0.041			<0.01 g/m3
Ammoniacal nitrogen			<0.001		0.282			<0.01 g/m3
Nitrite/nitrate nitrogen			-		<0.002			0.067 g/m3
Nitrate nitrogen			0.001		-			- g/m3
Suspended Solids			-		-			- g/m3
Stratified ?	no	no	-	no	no	-	-	-

See notes following tables.

Appendix 3.0: contd.

Lake	Waiparera	Waiparera	Waiparera	Waiparera	Waiparera	Waiparera	Waiparera	Waiparera	Waiparera
Site no	NLD000394	NLD000397	NLD001033	NLD000394	NLD000397	NLD000394	NLD000397	NLD001033	NLD001033
Site location	S.E. end	N.W. end	(composite)	S.E. end	N.W. end	S.E. end	N.W. end	(composite)	Centre
Date	11-Aug-1987	11-Aug-1987	11-Aug-1987	21-Feb-1989	21-Feb-1989	08-Aug-1989	08-Aug-1989	08-Aug-1989	21-Jan-1991
Time (NZST)	13:45	14:00		13:55	13:40	13:18	13:29		06:50 hrs
Chlorophyll <i>a</i>	-	-	-	-	0.019	-	-	0.015	0.006 g/m3
Secchi	2.6	3.4		1.2	1.2	1.15	1.25		1.6 m
Depth	3.8	4.0		3.1	5.0	4.25	4.85		2.9 m
Faecal coliforms	18	108		2	8	28	26		1 n/100ml
Faecal Streps.	5	<1		4	<2	2	12		- n/100ml
Dissolved oxygen	7.6	7.2		7.9	8.5	8.2	8.2		8.3 g/m3
Temperature	14.6	14.5		21.5	21.5	14.0	14.0		23.0 Deg.C.
pH	-	-		7.6	7.6	6.8	6.4	7.09	7.3 pH
Conductivity	27.5	27.5		32.6	32.6	22.8	22.8	-	29.0 mS/m @25Deg.C.
Alkalinity - bicarbonate			24.4		50.9			24.4	28.8 g/m3 HCO3
Alkalinity - total			20.0		41.7			20.0	23.6 g/m3 CaCO3
Alkalinity - carbonate			0.0		0.0			0.0	0.0 g/m3 CO3
Hardness - calcium			20.4		21.4			19.4	21.5 g/m3 CaCO3
Hardness - magnesium			50.8		53.2			38.0	42.2 g/m3 CaCO3
Hardness - total			71.2		74.6			57.4	63.7 g/m3 CaCO3
Calcium			8.16		8.60			7.80	8.60 g/m3
Magnesium			12.34		12.90			9.20	10.30 g/m3
Iron - total			0.04		0.08			0.19	0.07 g/m3
Potassium			2.48		3.82			3.30	3.60 g/m3
Sodium			35.6		29.0			26.0	32.0 g/m3
Chloride			56.0		229.0			40.4	49.6 g/m3
Silica			0.31		0.80			1.10	1.00 g/m3
Sulphate			44.4		29.4			27.4	29.2 g/m3
Diss. Reactive Phosphorus			0.022		0.019			0.086	<0.01 g/m3
Ammoniacal nitrogen			0.003		0.014			0.175	0.169 g/m3
Nitrite/nitrate nitrogen			-		0.005			0.090	0.015 g/m3
Nitrate nitrogen			0.016		-			-	- g/m3
Suspended Solids			-		-			-	4 g/m3
Stratified ?	no	no	-	no	no	-	-	-	no

See notes following tables.

Appendix 3.0: contd.

Lake	Unnamed	Unnamed	Unnamed	Unnamed
Site no	MLD000435	MLD000435	MLD000435	MLD000435
Site location	Centre	Centre	Centre	Centre
Date	12-Aug-1987	22-Feb-1989	09-Aug-1989	21-Jan-1991
Time (NZST)	12:30	10:55	10:45	11:15 hrs
Chlorophyll <i>a</i>	-	0.046	0.031	0.031 g/m3
Secchi	0.2	0.3	0.55	0.31 m
Depth	1.2	0.9	1.15	0.67 m
Faecal coliforms	90	40	482	80 n/100ml
Faecal Streps.	40	230	122	- n/100ml
Dissolved oxygen	8.3	7.5	8.4	6.8 g/m3
Temperature	14.3	20.0	15.0	23.5 Deg.C.
pH	-	10.6	6.49	6.3 pH
Conductivity	22.6	22.0	13.9	29.6 mS/m @25Deg.C.
Alkalinity - bicarbonate	2.4	6.1	5.5	7.3 g/m3 HCO3
Alkalinity - total	2.0	5.0	4.5	6.0 g/m3 CaCO3
Alkalinity - carbonate	0.0	0.0	0.0	0.0 g/m3 CO3
Hardness - calcium	18.0	9.4	8.0	16.6 g/m3 CaCO3
Hardness - magnesium	20.7	11.7	8.3	19.3 g/m3 CaCO3
Hardness - total	38.7	21.1	16.3	35.9 g/m3 CaCO3
Calcium	7.20	3.80	3.20	6.60 g/m3
Magnesium	5.03	2.80	2.00	4.70 g/m3
Iron - total	0.11	0.07	0.05	0.13 g/m3
Potassium	4.16	4.08	2.84	5.10 g/m3
Sodium	37.6	23.2	14.3	38.0 g/m3
Chloride	73.5	670.0	25.2	72.0 g/m3
Silica	2.90	2.10	2.60	7.50 g/m3
Sulphate	22.0	10.1	7.0	8.4 g/m3
Diss. Reactive Phosphorus	0.001	<0.01	0.111	0.019 g/m3
Ammoniacal nitrogen	<0.001	<0.01	0.057	0.057 g/m3
Nitrite/nitrate nitrogen	-	0.008	0.017	0.031 g/m3
Nitrate nitrogen	0.075	-	-	- g/m3
Suspended Solids	-	-	-	27 g/m3
Stratified ?	no	no	-	no

Notes :-

- NZST is New Zealand Standard Time.
- Blank or "-" indicates no test done, no sample taken, or not applicable.
- ">" (Secchi) indicates that the disk can still be viewed when on the bottom.
- n/100ml is bacterial colonies found per 100 ml of sample.
- "<" (Bacteriological tests) indicates no colonies detected at that level of test sensitivity.
- "<" (Chemical tests) indicates that levels are below the sensitivity of the test as shown.
- Composite samples were made by sub-sampling bulked samples from two open water sites in the lake, they were used for chemical analysis and registered against the centre of the lake.
- Site locations for open water sites are approximate in that samples taken on consecutive runs are from the same general area, e.g. N for northern end of lake.

HABITAT RANKING

Criteria for Ranking Sites of Special Biological Interest (SSBI) (Ogle 1987)

1. Outstanding

- (a) Presence or regular use by population of an endangered native species.
- (b) Areas vital to internationally uncommon species (breeding and/or migratory).
- (c) Areas vital to internally migratory wildlife species with very limited distribution or abundance.
- (d) Largely unmodified ecosystem or example or original habitat type not represented elsewhere in the country, of large size and containing viable populations of all or almost all species which are typical of the ecosystem or habitat type.

2. High

- (a) Site containing a vulnerable* native species.
- (b) A major habitat of a regionally threatened species.
- (c) Example of a largely unmodified site which is not represented to the same extent elsewhere in the ecological region and is used by most species which are typical of that habitat type for the region.
- (d) Presence of a species of an endemic family which is of limited abundance throughout the country although adequately represented in one ecological region but whose habitat is at some risk.

3. Moderate-High

- (a) Presence of a rare native species.
- (b) Areas containing high numbers of breeding or moulting birds or where breeding or moulting areas are of inter-regional significance to wildlife.
- (c) A large and fairly unmodified site or ecosystem which is represented elsewhere in the ecological region and contains all, or almost all, species typical of that habitat type for a particular region.
- (d) An area where any particular species is exceptional in terms of, say, abundance or behaviour but which is otherwise widespread.

4. Moderate

All sites supporting good numbers of species which are typical of that type of habitat within an ecological region and which have not been heavily modified by man's influence.

Appendix 4 contd.

5. Potential

All areas of some biological significance whose biological values are limited by small size, heavy modification or other factors, but which would have increased biological value if left to regenerate or if managed or developed for wildlife. (May include wildlife habitat which functions as a corridor, or which is sub-optimal habitat which may be necessary for maintaining genetic diversity.)

- * IUCN definition (= "threatened" in Bell 1986)

SCHEDULE : DESCRIPTION OF SITES OF SPECIAL BIOLOGICAL INTEREST

Freshwater Wetlands - Outstanding Value

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Kaimaumau-Motutangi Wetlands	55	Scientific Reserve, DoC Motutangi Swamp, DoC, rest is Land Corp or Private	O03,O04, N03/300000	To the north of Kaimaumau township and Rangaunu Harbour and between SH 1 and Eastern Beach	4,400ha comprising 3,000 freshwater wetland plus 1,400ha dune/coast	Aupouri	A very large contiguous wetland complex system which has an unbroken zonation of wetland sequences from seawater to freshwater. The wetland complex contains a sandy beach, small dunes, estuarine, peat bogs, semi-fertile swamp, and stabilised dunes with native shrubland. This habitat is home to a very large number of threatened flora and fauna which includes black mudfish, Northland green gecko, NZ dotterel, Australasian bittern, NI fernbird, banded rail, spotless crane, <i>Cyclosorus interruptus</i>, <i>Thelypteris confluentis</i>, <i>Lycopodium serpentinum</i>, <i>Cryptostylis subulata</i>, <i>Calochilus compesitris</i> - <i>Thelymitra</i> sp. The main vegetation includes <i>Baumea</i> spp, <i>Schoenus brevifolius</i>, wire rush, raupo, umbrella fern, hakea, <i>Acacia</i>, manuka, kanuka, <i>Coprosma</i> spp, and mingimingi. Unfortunately, 90% of this wetland was modified by fire two years ago, but it is recovering. This area (along with the three northern harbours of Rangaunu; Houhora and Parengarenga) is being investigated for RAMSAR status as a wetland of International significance.
Lake Ohia Catchment and Adjoining Sedge-shrublands	111	Scientific Reserve	O04/440920	Adjacent to Inland Road off State Highway No. 10, Karikari Peninsula	830ha	Aupouri	A mosaic wetland of temporary pan/hard sand in the middle and eastern margins, with a semi-peat/sand bottom along the western edge. Remnant exposed kauri stumps date to 30,000 to 40,000 years ago. Within old lakebed "islands" with manuka dominant and hakou, mingimingi and sedges are to be found. Adjoining sedge-shrublands of manuka, <i>Baumea</i>, <i>Schoenus</i>, <i>Lepidosperma</i> spp. This habitat supports a diversity of birds in high numbers including the threatened: Australasian bittern, NZ dotterel, banded dotterel, sharp-tailed sandpiper, caspian tern - as well as the regionally significant spotless crane, NI fernbird and Northland green gecko. There are also threatened plants present: <i>thelypteris confluentis</i>, <i>Thelymitra malvina</i> and <i>Cryptostylis subulata</i>, <i>Todea barbara</i> as well as the threatened black mudfish.

Freshwater Wetlands - High Value

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Andrews Swamp	88	Private	N04/293843	1.5km south Paparore School off Sweetwaters Road.	3	Aupouri	Small, good quality swamp with <i>Eleocharis</i> dominated reed bed with sphagnum moss mat underneath and a manuka periphery. No open water. Australasian bittern and NI fernbird present.
Lake Austria	16	Unknown	M02, N02/957369	6km south of Waitiki Landing.	13	Aupouri	An undisturbed dune lake and associated swamp wetland with 45% open water and dominant <i>Baumea articulata</i> and <i>Eleocharis</i> sp with infrequent <i>Leptocarpus similis</i> successional to manuka-bracken fern periphery. Spotless crane, NI fernbird and scaup present. Water level affected by surrounding pines.
Butrush Lake	36	DoC	N03/106215	End of private road, 4km north of Ngataki on left.	25	Aupouri	Dune lake with extensive swamp on one side. One sandy shore backed by manuka/kanuka scrubland. <i>Eleocharis</i> fringe on one side. 30% open water. NZ dabchick and grey teal present. Trampled by stock.
Dabchick Lake	39	DoC	N03/107190	4km west of Ngataki	5	Aupouri	An excellent quality small dune lake with a broad <i>Eleocharis</i> fringe and a raupo swamp at the northern end. Australasian bittern and NZ dabchick present.
Half Lake	41	DoC	N03/109185	4.5 km west of Ngataki	26	Aupouri	An excellent quality dune lake with a dividing peninsula and raupo/ <i>Eleocharis</i> fringe. Two areas of raupo swamp at northern end. 50% open water, 40% raupo, surrounded by manuka/kanuka periphery. High numbers of NZ dabchick, with Australasian bittern, Australian little grebe and shoveler ducks present.
Headquarters Pond	74	Juken-Nissho Corp (covenanted)	N04/283875	Turn off Far North Road at Juken-Nissho Corp. Headquarters, 1km down Headquarters Road on the north side.	6	Aupouri	Very good quality semi-fertile wetland containing a dense sward of <i>Baumea articulata</i> , <i>Eleocharis sphacelata</i> and raupo. Little open water with some peripheral stock damage. <i>Myriophyllum robustum</i> present. Also NI fernbird, spotless crane and brown teal (1978)
Lake Heather	90	DoC	N04/285835	Off Sandhills Road (east of Awanui), take DoC road just north of Land Corp woolshed and yards.	11	Aupouri	Good quality dune lake in old consolidated dune depression, 75% open water with <i>Eleocharis</i> and <i>Juncus</i> spp. Kikuyu periphery except NE edge of bracken/tobacco weed/gorse. Marshfern <i>Thelypteris confuans</i> and <i>Myriophyllum robustum</i> present. NZ dabchick with Australasian bittern, Australian little grebes, grey teal and good duck numbers also present.

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Karatia Swamp	13	Private (P Nilsson)	M02, N02/970393	Off Far North Road, 1km south Thoms Landing	45	Aupouri	Very good quality swamp in two sections. Top section of 10 ha in a ravine basin surrounded by steep bluffs. <i>Eleocharis sphacelata</i> and <i>Empodisma minus</i> successional to flax/raupo/manuka. Bottom section of 25ha with small amount open flowing water with raupo, <i>Baumea</i> spp., manuka and flax successional to bracken/manuka. Healthy NI fernbird population with Australasian bittern also present. <i>Todea barbara</i> fern.
Lake Kihona	24	Aupouri Forest	N03/020304	300m west of No. 3 arterial road (6km west of Tangoake).	10	Aupouri	Excellent quality unmodified dune lake with clear water and pine surround. Narrow discontinuous raupo- <i>Eleocharis</i> fringe with rushes- <i>Gleichenia-Blechnum</i> -manuka bog and raupo swamp on eastern end. Manuka buffer to pines. NI fernbird present.
Mini and Round Lakes (Reservoir Lake)	96	Land Corp	N04/282807 279807 279804	500m west of Sandhills Road. 8km from Awanui	15	Aupouri	Long narrow lake and small round lake set in undulating low-lying sandhills. 50% open water and <i>Eleocharis sphacelata</i> -raupo- <i>Baumea articulata</i> . Good habitat for Australasian bittern; NZ dabchick present, black swan breeding.
Lake Morehurehu	26	Carter-Holt Harvey	N03/107288	Forestry road off Harawira Road, 2km north of Te Kao.	47	Aupouri	Good quality unmodified large dune lake with clear water. Discontinuous <i>Eleocharis</i> fringe with narrow shrub fringe between reeds and pines. Connected to another small lake with raupo- <i>Eleocharis</i> fringe. NI fernbird present with <i>Todea barbara</i> fern.
Lake Ngakapua	78	Private (unknown)	N04/285868	Turn off Far North Road at Forestry Headquarters. 500m south of Headquarters Road.	11	Aupouri	Scenic dune lake with 60% open water (small island of manuka/flax). Part of Ngakapua Lake chain. Vegetation consists of <i>Eleocharis</i> spp., raupo and <i>Juncus</i> sp., some stock encroachment. Australasian bittern, NI fernbird, NZ dabchick and grebe species present.
Whataru Bay Swamp	104	Maori	O03/474108	Inland from Whataru Bay, Karikari Peninsula	4	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed). A swamp of dense <i>Eleocharis</i> /raupo with some <i>Juncus</i> and very little open water. Sand encroachment occurring. Good crane habitat. Australasian bittern present.

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	DESCRIPTION
Lake Ngakapua West	80	Private (Unknown)	N04/280866	1km south of Headquarters Road, 2km west of turn off from Far North Road.	0.5	Aupouri	Good quality dune lake of 85% open water. Vegetation includes: Eucalypts over gorse-manuka-tree ferns (periphery) over dominant <i>Eleocharis</i> sp., <i>Juncus</i> sp.- <i>Lemna minor</i> - <i>Azolla rubra</i> . NZ dabchick and Australasian bittern.
Lake Ngatu	83	DoC	N04/290855	2.5 km east of Waipapakauri Beach.	75	Aupouri	A large dune lake with 80% open clear water. Reed beds <i>Eleocharis sphacelata</i> , <i>Baumea</i> spp., <i>Leptocarpus</i> and manuka. Wetland supports a range of bird species including: NZ dabchick, and rarities white heron (1978), Glossy ibis (1978) and yellow-billed spoonbill (1978). High recreational use.
Ngatu Pond	85	Private (unknown)	N04/286847	Near access from Lake Ngatu recreation area.	4	Aupouri	Excellent quality small wetland between sand dune ridges. 50% open water. <i>Eleocharis</i> spp.-manuka- <i>Baumea ariculatus</i> - <i>Scirpus prolifer</i> .
Ngatumoroki Lake and swamp system	34	Crown?	N03/086224	5km south of Te Kao	100	Aupouri	High quality deep dune lake bounded to the south by steep dunes and to the north by twin lowland basins with rush and shrub vegetation. 60% open water with <i>Eleocharis sphacelata</i> , <i>Eleocharis acuta</i> , manuka/kanuka margin. NI fernbird and NZ dabchick present.
Pumphouse Pond	76	Private (unknown)	N04/283873	Turnoff Far North Road at Forestry Headquarters. South of Headquarters Road.	5	Aupouri	Good quality dune lake with an adjoining swamp. 30% open water with remainder <i>Baumea articulata</i> , <i>Eleocharis sphacelata</i> and kanuka. Used as water source for Juken-Nissho Corp. dwellings. Scaup, NI fernbird and dabchick sp. present. <i>Mysiophyllum robustum</i> aquatic plant reported.
Lake Rotokawau	79	Private (unknown)	N04/296870	Off Rotokawau Road, 1km from Far North Road turnoff.	20	Aupouri	Very good quality shallow lake with reedbeds. 75% open water with the remainder <i>Eleocharis</i> , <i>Baumea</i> spp and manuka. Excellent for NI fernbird, grebe and water fowl. NZ Dabchick, Australian little grebe and Australasian bittern present.
Rotokawau Lakes Wetland	106	DoC	O03/395034	Between Puheke Rd and Puheke Beach, Karikari Peninsula	145	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed.) Two lakes, the main to the west having relatively clear water with pohutukawa emergent over hakea, wattle, with <i>Pseudopanax lessonii</i> , <i>Eleocharis sphacelata</i> and <i>Lepidosperma</i> sedge surround. The smaller lake has similar vegetation and turbid water. Habitat supports: NZ dotterel, Caspian tern, NI fernbird, marsh crane and 4 shag species breeding.

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Lake Rotoroa	93	DoC	N04/288827	2km west of Sandhills Rd	32	Aupouri	Unconsolidated dune lake with 95% open water. Part of a chain of lakes with high biological values. <i>Baumea</i> spp. with manuka/kanuka/gorse adjoining northern shoreline. Some cattle encroachment into periphery. NZ dabchick and Australian little grebe present. Unmodified.
Sandhills Road Wetland No. 1	101	Land Corp	N04/284758 286763	500m east of Sandhills Rd, 8km from Ahipara	23	Aupouri	Lake and swamp lying within undulating consolidated grass covered sand dunes. Mosaic of open water (35%) and <i>Eleocharis</i> spp, <i>Baumea</i> spp occasional <i>Myriophyllum</i> spp (including the endangered <i>Myriophyllum robusta</i>). Good diversity of bird species including Australasian bittern and pied stilt hybrids (D2 or E phase).
Selwyn Flat Wetland	58	Juken-Nissho Corp (covenanted with DoC)	N04/253974	2.5km north-west of Lake Waiparera (access via No. 3 arterial Road)	10	Aupouri	Very good quality eutrophic swamp, one of very few fertile swamps in the area. Dense sward of <i>Baumea</i> spp, raupo, <i>Coprosma</i> spp and flax. Marsh fern <i>Thelypteris confluentis</i> and two swamp mairas (very rare in the ecological region) located. NI fernbird present.
Spains Road Swamp	89	Private	N04/300840	Adjacent to Spains Road 1.5km from Sweetwater	10	Aupouri	A shallow swamp of rushes with scattered patches of manuka and small muddy bottomed areas of open water. Dense <i>Eleocharis</i> bed with <i>Baumea</i> spp also present. Australasian bittern present.
Spilt Lake Wetland	94	DoC	N04/278815	2km west of Sandhills Road 5km from Awanui	16	Aupouri	An excellent quality suspended floating bog in a shallow depression located in undulating grass covered sand dunes. Vegetation includes raupo, <i>Baumea articulata</i> , <i>Eleocharis</i> spp., <i>juncus</i> sp, <i>carex</i> sp, <i>Myriophyllum robustum</i> and 10% open water. Australasian bittern and crakes present.
Swan Lake	43	DoC	N03/111172	4km west of Ngataki	26	Aupouri	An Excellent quality swamp with areas of open water. <i>Eleocharis</i> spp, raupo, <i>Baumea</i> spp, and manuka/kanuka. <i>Myriophyllum propinquum</i> and <i>Lepiocarpus</i> present. Good NI fernbird numbers with Australasian bittern also present.
Sweetwater Road Swamp	87	Private (N Andrews)	N04/293846	2km south of Paparore School, west of Sweetwaters Road	12	Aupouri	Mostly unmodified peat swamp of manuka, <i>Eleocharis sphacelata</i> , <i>Baumea</i> spp. and open water. Australasian bittern present.
Lake Taore	33	DoC (reserve)	N03/130250	East of Far North Road, 6km south of Te Kao	35	Aupouri	Shallow lake with small islands and a raupo swamp at the northern and southern ends. 30% open water with stock trampled raupo fringe. Good bird numbers including grey teal, cattle egret, little egret, shoveler duck and Australasian bittern (1978).

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Tangaonge Wetlands	100	DoC	N04/004/705770	4km west of Kaitaia	120	Aupouri	A poor quality (due to ongoing development) but large semi-mineralised wetland which is seasonally wet. Zones of semi-acid peat bog. Thickets of manuka with <i>Baumea</i> spp, <i>Juncus</i> spp, <i>Glechnia</i> fern and bracken. NI fernbird, Australasian bittern, spotless crane and hundreds of water fowl and waders present when seasonally flooded.
Te Kao (south) Swamp	32	Crown	N03/090256	Adjacent to Far North Road. 1km south of Te Kao	100	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed) Excellent large habitat for swamp birds. A shallow freshwater lake of 15% open water with <i>Eleocharis</i> spp. throughout. Periphery of manuka and lupins. Australasian bittern present.
Lake Te Kahika	23	Carter-Holt Harvey	N02, M02/111309	3km east of Tangoake	19	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed) Excellent quality unmodified lake and swamp system with clear water. <i>Eleocharis</i> fringe and peat bog of rushes, wire-rush, <i>Gleichenia dicarpa</i> . Raupo swamp extends towards the beach. Buffer of hakea, manuka and rushes. <i>Todea barbara</i> fern present. NI fernbird and spotless crane present.
Te Werahi Wetland	5	DoC	M02, N02/ 1. 810486 2. 824480 3. 845472	Extending over 10km west of Cape Reinga Road	525	Te Pahi	Large unmodified habitat with a slow moving stream, lagoons and swamp. Habitat consists of 3 distinct sections (1) tidal inlet and dunes, (2) Raupo dominant freshwater wetland, (3) inland open water system including lagoons. Large paradise shelduck moulting site, NZ dotterel and banded dotterel breeding, and NI fernbird present.
Upper Karatia Swamp	14	Leased to Juken-Nissho Corp	M02, N02/948384	3km south-west of Karatia	25	Aupouri	Good quality dune swamp on a large flat beach. Vegetation consists of mainly <i>Baumea</i> spp, manuka and <i>Aleironia dicarpa</i> . <i>Todea barbara</i> fern present. NI fernbird present.
Lake Wahakari	28	Juken-Nissho Corp	N03/040277	Adjacent to Te Ahu Road near Ngatiwhetu	150	Aupouri	A good quality large lake with discontinuous raupo and <i>Eleocharis</i> fringe and rushes- <i>Gleichenia</i> -manuka bog at the western end. Manuka-Hakea shrub on the eastern side. NI fernbird and good scaup numbers present.
Lake Waihanae	22	Juken-Nissho Corp and Parengarenga Maori Trust	M02, N02/996330	1km SE of Toetoe trig	5	Aupouri	A good quality, steeply-sided, long, narrow dunelake. Good sheltered bays and arms for chick rearing. 60% open water with toetoe, raupo, <i>Eleocharis sphacelata</i> and manuka/kanuka shrubland. Good selection of water fowl. NZ Dabchick and shoveler duck present.
Waipapakauri Beach "Lake"	86	Private	N04/284842	1km south of lake Ngatu	18	Aupouri	An overgrown dunelake with dense luxurious <i>Eleocharis</i> beds. <i>Scirpus prolifer</i> also dominant with <i>Baumea articulata</i> and <i>Polygonum hydropiper</i> . Good kanuka/manuka along northern edge. Some stock access. Excellent habitat for Australasian

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Lake Waiparera	62	Private (various incl. FNDC)	N04/274952	Adjacent to Waiharara township	135	Aupouri	A large lake of 95% open water with a sandy shore on the eastern side, behind which is a <i>Leptocarpus</i> fringe with manuka. A good variety of birds including moderate numbers of waterfowl.
Wairahi Swamp	31	Private (various)	N03/120270	Running from 1km east of Te Kao to the coast.	180	Aupouri	A pristine large swamp with a mosaic of two vegetation types. Raupo-manuka/ <i>Gleichenia</i> dicarp-rushes and manuka- <i>Baumea articulata</i> -rushes. Raupo is dominant in some areas and manuka-rushes in other areas. Some stock encroachment. <i>Thelypteris confluens</i> fern, Caspian terns and NI fernbird (1978) present.
Western Waiparera Wetlands	63	Juken-Nissho Corp (covenanted)	N04/260947 267949 254942	West of Lake Waiparera	110	Aupouri	A high quality large semi-fertile wetland containing a small lake. 90% of the area is a dense sward of <i>Baumea articulata</i> , <i>Eleocharis sphacelata</i> , <i>scirpus</i> sp and <i>Juncus</i> spp. One of best wetlands in the ecological region. Contains threatened plants <i>Cyclosorus interruptus</i> , <i>Thelypteris confluens</i> and <i>Myriophyllum robustum</i> . NZ dabchick, Australian little grebe, scaup and good NI fernbird numbers.
Whakatereohao Stream Swamp	15	Leased to Juken-Nissho Corp	M02, N02/9983385	West of Far North Road. 2km south of Karatia	30	Aupouri	High quality dune swamp in a long, narrow valley with a tidal stream across the bottom edge. Vegetation includes: <i>Baumea</i> spp, <i>Eleocharis</i> spp, flax, raupo and <i>Gleichenia dicarpa</i> . Good habitat for NI fernbirds which are present.
Lake Wingy	42	DoC and Juken-Nissho Corp	N03/106176	5km west of Ngataki	15	Aupouri	Excellent quality dune lake with adjoining areas of swamp. Lake is divided in two by a bracken and gorse covered sandy ridge. The eastern larger part is an extensive area of raupo, <i>Eleocharis sphacelata</i> and 25% open water. Smaller western part is 80% open water and raupo. There is a narrow raupo fringe around half the circumference. NZ Dabchick, shoveler duck and spotless crane present.
Ponaki Lagoons	6A	DoC, Maori	N02, M02/105460	4km north of Parengarenga harbour entrance	117	Te Pahi	Complex mosaic of sand beach, dunes, tidal lagoon, brackish to freshwater lagoons. Supports coastal breeding waders (NZ dotterel, variable oystercatcher) and lagoons, (waterfowl, spotless crane and fernbird). (Total area 520 ha, freshwater wetland 117ha.)
Tapotupotu Wetland	4	DoC	M02, N02 850500	4km SE of Cape Reinga	25	Te Pahi	Brackish to freshwater estuary wetland. Lack of modification. Contiguous with estuarine flora and fauna.

NAME	HABITAT NUMBER	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Tom Bowling Bay Wetland	1	DoC and Maori	N02,M02/100530	5km SE of North Cape.	370	Te Pahi	Wetland mosaic, freshwater swamp and pond complex, sand beach and dunes. Nationally important habitat of breeding NZ dotterel and pied shag, also spotless crane and fernbird. (Total area 800ha, freshwater wetland 370ha.)
Waitahora Wetland	3	DoC	N02,M02948497	12km E of Cape Reinga (Spiritus Bay)	255	Te Pahi	Complex mosaic of sand beach, dunes, tidal flats, brackish to freshwater stream, lagoons and swamps. Breeding NZ dotterel, fernbird.
Whareana Bay Environs	6	DoC, Maori	N02,M02/108494	7.5 km south west of North Cape.	17	Te Pahi	Beach, dunes, swamp with open water and raupo. Breeding NZ dotterel. Fernbird on margins. <i>Placostylus ambagiosus whareana</i> colony. (Total area 100ha, freshwater wetland 17ha.)
Northern Tokerau Swamp	108	DoC	O04/440990	Between Inland Road and Tokerau Beach, north of Dick Ulrich Road, Karikari Peninsula	80	Aupouri	(Based on 1985 information.) A semi-fertile peat swamp of scattered emergent cabbage trees, over sporadic to clumped manuka, raupo, NZ flax, pampas and gorse. Vegetation also includes: <i>Baumea</i> , wire rush, umbrella fern and <i>Lepidosperma</i> sedge. More fertile areas have NZ flax, raupo and <i>Carex</i> sedges. Pond areas have <i>Carex virgata</i> , <i>Eleocharis acuta</i> and pond weed. Good numbers and diversity of wetland birds including Australasian bittern, NI fernbird, Australian red-breasted shelduck.
Southern Tokerau Swamp	109	DoC	O04/450957	Between Inland Rd and Tokerau Beach, north of Tokerau Beach Road Karikari Peninsula	90	Aupouri	A peat-bog with some fertile areas. Scattered to moderate areas of emergent manuka and <i>Baumea</i> sedges, <i>Schoenus</i> sedge, wire rush and umbrella fern. More fertile areas of raupo, NZ flax and willow weed. Habitat supports NI fernbird and <i>Galaxias</i> sp fish. Threatened <i>Lytopodium serpentinum</i> present.
Upper Waimango Swamp	105	DoC and Private	O03/435045	Inland from Karikari Bay	590	Aupouri	(Based on 1985 information.) A freshwater to brackish swamp of dominant manuka with NZ flax, raupo, <i>Baumea</i> sedges, <i>Schoenus</i> sedges and <i>Carex</i> spp. Cattle encroachment and drainage. Supports Australasian bittern, NI fernbird, NZ dotterel and variable Oystercatcher.
Lake Waiporohia	107	DoC	O03,O04/428000	Adjacent to the intersection of Inland Road and Rangiputa Road Karikari Peninsula	12	Aupouri	(Information based on 1985 data) A freshwater lake of 90% open water. Vegetation includes peripheral of poplar and pohutukawa, manuka, raupo, <i>Baumea articulata</i> and <i>Eleocharis sphacelata</i> . Threatened bird species present are: Australasian bittern, Caspian tern and Australian red-breasted shelduck.

Freshwater Wetlands - Moderate-High Value

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Bacica Road Lake	57	Juken-Nissho Corp. (Covenanted)	N04/258995	1.5 km west of the Far North Rd, 5km north of Waiharara.	6.5	Aupouri	Very good quality unmodified dunelake with some swamp vegetation, <i>Eleocharis</i> spp, <i>Baumea</i> spp, <i>Juncus</i> sp, cabbage tree, manuka, raupo and flax. 50% open water. Forms an ideal habitat for NZ dabchick, Australasian bittern, crane and waterfowl. Five swamp maire found which is very rare in the Ecological Region.
Dunes "Swamps"	82	Private (Dunn)	N04/277862, 280861, 284863	Adjacent to the Lake Ngatu Motorcamp.	10	Aupouri	Three small remnant swamps, one fenced, the others with stock encroachment. Vegetation includes: <i>Baumea</i> spp, <i>Eleocharis</i> spp, <i>Polygonum hydropiper</i> , <i>Myriophyllum propinquum</i> , <i>Scirpus prolifer</i> and <i>Leptocarpus similis</i> . Australasian bittern, pied stilt present and a breeding site for water fowl.
East Coast Roadway Swamp and Lake	29	Carter-Holt Harvey	N03/114280	At the end of East Coast Rd, Te Kao.	9	Aupouri	An excellent quality unmodified small dunelake and swamp with an <i>Eleocharis</i> fringe and 70% clear open water. NI fernbird present.
Waiparera Creek Wetland	59	Private (Shine)	N04 004/303965	2.5km up Kaimaumau Road.	20	Aupouri	A freshwater swamp either side of a tidal creek. Vegetation includes: <i>Leptocarpus</i> , raupo, manuka and <i>Baumea juncea</i> . Severe cattle damage upstream of the bridge. NI Fernbird present.
Forestry Swamp	73	Unknown	N04/286881	500m past forestry headquarters and west of the Far North Road.	5	Aupouri	A good quality swamp with a dense bed of <i>Baumea</i> spp and clumps of manuka trees with occasional <i>Eleocharis sphacelata</i> , NI fernbird present.
Hearlings Swamp	68	Private (Hearling)	N04/299917	East of the intersection of Paparore and Heath Roads, (turn off Far North Road 3.5 km south of Waiharara).	25	Aupouri	A swampy modified mosaic of vegetation with two drains through it. Dominant species are: raupo, <i>Cyperus usulanus</i> , manuka and <i>Baumea articulata</i> . Highly modified, however, Australasian bittern present.
Johnson Swamp	64	Private (Johnson)	N04/300940	To the east of Heath Road, 2km west of Waiharara.	1	Aupouri	A small swamp with a shallow <i>Eleocharis sphacelata</i> bed covering the entire habitat, with occasional <i>Baumea</i> sp and a manuka surround. Severely modified and cutover, however, Australasian bittern and good pukeko numbers present.

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Kaikoura Farms Wetland	99	Kaikoura Farms	N04/277769	500m west of Sandhills Road, 8km North of Ahipara.	1.5	Aupouri	A small peat depression amongst undulating grass-covered sanddunes. A good mixture of tall and short swamp vegetation and 25% open water. Raupo, <i>Scirpus prolifer</i> , <i>Baumen acticulata</i> , <i>Eleocharis sphacelata</i> , and small island. Stock have access and have trampled edge. Australasian bittern present.
Kapowairua Wetland	2	Crown	N02, M02/985527	Adjacent to spirits Bay campground	30	Te Pahi	(Information based on 1978 data. The wetland required an updated inspection as it may have been modified or developed.) Large swamp associations with dominant raupo. Outlet closed by sand. Surface water at the lower end. Manuka periphery. Spotless crane and Australasian bittern present.
Katavich Lake and Swamp	60	Private (Vuksich Bros)	N04/259953	1.5km west of Lake Waipera	7.5	Aupouri	A raupo dominant dunelake with 30% open water and good edge habitat. Stock have access to the swamp but cause little damage. Moderate numbers of common waterfowl. Spotless crane present and Australasian bittern reported.
Kowhai Swamp	51	Private (B Wagner)	N03/250118	Between Kowhai Beach and Houhora Bay, Mt Camel peninsula	20	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed.) A dense raupo swamp with <i>Phormium</i> , <i>Juncus</i> , <i>Lepiocarpus</i> , <i>Eleocharis</i> , manuka periphery. There is no open water, but good numbers of spotless crane and Australasian bittern.
Lake Ngakeketa	9	DoC	M02, N02/900425	Off Te Pahi Stream Road, 3km from turnoff.	15	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed.) Dunelake with 70% open water and a lake edge of mainly raupo, some <i>Eleocharis</i> . Surrounded by manuka, kanuka and some pine. Good diversity of bird species.
Salt Lake	35	DoC and Maori	N03/132217	4.5km north of Ngataki, west of Far North Road.	9	Aupouri	An excellent quality unmodified lake and swamp with a dense, broad, raupo fringe and area of manuka shrub. 20% open water. Good fernbird habitat although none recorded.
Te Hapua Swamps	7	DoC	M02, N02/982458, 971440	North of Te Hapua Road, 3km and 5km from Waitiki Landing.	50	Te Pahi	Two freshwater swamps with no open water, but raupo, rushes and sedges surrounded by manuka. Some pig and horse sign. NI Fernbird in manuka. Good spotless crane habitat.
Toetoe Road Pond	25	Carter-Holt Harvey	N03/015296	7km west of Tangoake	5	Aupouri	A good quality swamp and pond system with two areas separated by about 50m. The first area is a raupo/toetoe swamp with little open water (3ha). The second area is a small muddy-brown water lake of 80% open water with a narrow <i>Eleocharis</i> fringe right around. <i>Eleocharis</i> swamp at one end and raupo swamp at the other (2ha). Spotless crane and Australian little grebe present.

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Turks or Swan Lake and Swamp	56	Juken-Nissho Corp (covenanted)	N04/245995, 248998	5km NW of Lake Waiparera	15	Aupouri	A small lake with an adjoining, very good quality swamp. The dominant vegetation is <i>Eleocharis sphacelata</i> , <i>Baumea</i> spp, <i>Juncus</i> spp and manuka. The lake has 80% open water, however, the swamp make up 90% of the overall habitat. Australian little grebe and NI fernbird present.
Lake Waihopo	47	Private (T McManus) and DoC	N03/150160	3km west of Waihopo Landing	17	Aupouri	A dunelake with large reed fringe, mainly <i>Eleocharis sphacelata</i> , also <i>Baumea articulata</i> and raupo. 30% open water. Good numbers of ducks and spotless crane present.
Lake Waikanae Junior	21	Parengarenga Maori Trust	M02, N02/995335	Just north of Lake Waikanae, 500m east of Toetoe trig.	1	Aupouri	A good quality small, steep-sided dunelake. Bluffs and waterfalls exclude stock from an area of puriri/taraire, 95% open water with raupo, <i>Eleocharis</i> and <i>Scirpus prolifer</i> . Forest remnant contains rewarewa, puriri, taraire, titoki, kohekohe, <i>Pseudopanax</i> sp, <i>Coprosma rhamnoides</i> and <i>Peperomia</i> . Excellent little remnant of forest. Shag colony which is rare in the Ecological Region.
Lake Waimimiha and Other	103	Private (Masters)	N04/264730, 263735	500m west of Sandhills Road, 4km from Ahipara	25	Aupouri	Two lakes lying within undulating sand dunes. Open water 80% with patches of <i>Eleocharis sphacelata</i> , which is also in the fringe. Vegetation includes: raupo, <i>Scirpus prolifer</i> and surrounds of manuka, cabbage tree, and tree ferns. Large size, good habitat for breeding waterfowl and probably Australasian bittern. Shag breeding area. Good duck numbers and spotless crane.
West Coast Road Lake	82A	Unknown	N04/277855	Adjacent to West Coast Road, 1.5km from Lake Ngatu.	5	Aupouri	A dense bed of <i>Eleocharis sphacelata</i> with open water at the western end and a strip along the southern side. Stock have limited access. NZ dabchick and spotless crane present.

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Gully Lake	53A	Land Corp	N03/182088	3km west of Pukenui	3	Aupouri	Old consolidated dune lake, situated in a deep gully. Pasture and mature pines surrounding periphery of <i>Eleocharis sphacelata</i> . Grey duck present.
Heart Lake	11	Private	M02,N02/924408	4km southwest of Waitiki Landing	4	Aupouri	(Information based on 1978 data. The wetland required an updated inspection as it may have been modified or developed.) A small dune lake with surrounding swamp of <i>Baumea</i> , <i>Juncus</i> , raupo, flax, <i>Eleocharis</i> and manuka. Poor bird diversity. NI fernbird recorded.
Henderson Bay Rd Swamp 1	46	Private (Unknown)	N03/174167	South side of Henderson Bay Road, 1km from turnoff.	4	Aupouri	A reasonable quality swamp with a dense reed bed with some open water. Vegetation : <i>Eleocharis sphacelata</i> , manuka and <i>Baumea articulata</i> . Low bird count but possible crane and bittern habitat (crane present on swamp close by - Henderson Bay Road Swamp).

Freshwater Wetlands - Potential Value

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Alex Macrae Wetland	75	Private (Alex Macrae)	N04/302877	East of Far North Road, 1.5km south of Forestry Headquarters	0.4	Aupouri	Very good quality but small semi-infertile wetland in a consolidated dune gully. Dense shrubland periphery of manuka. Vegetation includes <i>Baumea teretifolia</i> , <i>Gleichenia dicarpa</i> , <i>sphagnum</i> moss, and mamaku. Poor bird count.
The Big Lake	12	Private (Maori)	N02,M02/952398	2km west of Karatia (Thoms landing)	1	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed.) A once large, now semi-drained lake of 50% <i>Eleocharis</i> and 50% open water with a manuka periphery. Paradise shelduck breeding and NI fernbird present.
Broadhursts Swamp	69	Private (Broadhurst)	N04/295909	West of Paparore Road (intersects with Far North Road. 3km south of Waiharara)	9	Aupouri	A raupo, <i>Cyperus</i> and manuka mosaic with a drain thorough it. Low bird numbers.
Bull Paddock Lake	38	Unknown	N03/109193	4.5 km northwest of Ngataki.	5	Aupouri	A degraded <i>Eleocharis</i> wetland with 50% open water. Trampled and pugged. Ducks and white-faced herons present.
Cemetery Road Pond	50	Land Corp	N03/194117	1km west of Houhora	1	Aupouri	A good quality small farm pond with muddied water and <i>Eleocharis sphacelata</i> . Small amount of raupo and poor bird count.
Clarke Road Wetland	102	Land Corp	N04/280746	50m east of Far North Road, 6km north of Ahipara	2	Aupouri	A small shallow pond depression. Limited by lack of plant diversity and stock presence. Low bird count.
Dean's Swamp	81	Private (Dean)	N04/286865	500m north of Lake Ngati	1	Aupouri	A small, highly modified swamp with sparse <i>Eleocharis sphacelata</i> and muddy puddles of water.
Eleocharis Lake	40	Nissho-Juken Corp	N03/103187	5km west of Ngataki	5	Aupouri	A swamp and wet pasture of 50% <i>Eleocharis</i> and <i>Baumea articulata</i> . No open water. Australian little grebe recorded 24.8.80.

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Heath Rd Powerline Swamp	65	Unknown	N04/297932	West of Heath Road, 2km from Waiharara	25	Aupouri	An area of short manuka with rushes and <i>Cassipha</i> , <i>Dracophyllum</i> mixed in forming an impenetrable mat 1.2m deep with <i>Acacia melanoxylon</i> tree emergent mainly along the edges. Low bird count.
Henderson Farm Pond	44	Private (Unknown)	N03/178174	North side of Henderson Bay Road, 1.5km from turnoff.	0.5	Aupouri	A small farm pond with mostly open water and narrow discontinuous <i>Eleocharis sphacelata</i> fringe. A small grass covered island in pond. Paradise and mallard duck present.
Lambs Road Swamps	53	Land Corp	N03/197090, 193091	2.5km west of Pukenui.	8	Aupouri	A moderate quality swamp with two areas. <i>Baumea articulata</i> and <i>Eleocharis sphacelata</i> with 20% open water. Tree stumps and logs.
New Lake	10	Private	N02 M02/921411	3km south of Te Pahi Station.	5	Aupouri	(Information based on 1978 data. The wetland requires an updated inspection as it may have been modified or developed.) A small lake almost completely covered in a dense <i>Eleocharis</i> stand. Little shag and paradise ducks present.
Onepu Swamp	37	Unknown	N03/128213	1.5km west of Far North Road, 4km north of Ngataki.	0.5	Aupouri	A good quality pond area associated small swamp enclosed by a fence. Raupo with bracken, grasses and <i>Baumea articulata</i> . Open water of about 10%. Low bird count.
Pages Lake	70	Private (N Page)	N04/280907	500m west of Far North Road, 4km south of Waiharara.	4	Aupouri	A raupo fringed lake with two manuka patches. 80% open water and some stock damage. Australian little grebe observed 1978.
Paparore Eleocharis Swamp	72	Private	N04/302836	1.5km northwest of Forestry Headquarters	1.3	Aupouri	A small swamp with a dense <i>Eleocharis</i> bed with clumps of manuka. Cattle have access but swamp is in good condition. An albino welcome swallow recorded.
Pretty Lake	17	Juken-Nissho Corp	M02, N02/955354	5km southwest of Karatia (Thoms landing)	12	Aupouri	A clean undisturbed dune lake with 95% surface water and the remainder <i>Eleocharis sphacelata</i> and <i>Baumea articulata</i> . Lack of cover makes this lake of limited value to swamp/water birds.
Rotokawau Road Pond	77	Private	N04/296874	500m down Rotokawau Road	1.25	Aupouri	A poor quality, shallow, muddy pond with severe stock damage and few birds. <i>Eleocharis sphacelata</i> and open water.

NAME	HABITAT NO.	TENURE	MAP GRID REF.	LOCATION	AREA (HA)	ECO REGION	HABITAT DESCRIPTION
Lake Rotoroa Swamp	92	Private (Joe King)	N04/293831	1km northeast of Lake Rotoroa.	1	Aupouri	An old arm of Lake Rotoroa, now a poor quality swamp with stock encroachment. <i>Baumea</i> spp., <i>Eleocharis</i> spp. and manuka periphery.
Salvation Road Swamp	52	Land Corp	N03/193099	2km west of Pukenui	5	Aupouri	A shallow, reedy swamp of 50% open water and <i>Eleocharis sphacelata</i> , <i>Baumea</i> sp. and tree stumps. Highly modified with stock grazing and trampling.

