



FARM ENVIRONMENT PLAN (FEP)
BRIEN FARM
140 MORRISON ROAD, PUKEKAWA



Version Control

Version 1	Draft FEP prepared to determine likely information requirements and associated costs	August 2016

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1. Company Overview

Balle Bros Group specialise in the growing, packing, and marketing of high quality produce for both local and overseas markets. We currently farm 2854ha within the Waikato region, producing a range of crops such as Potatoes, Onions, Carrots, Cabbage, Cauliflower and Pumpkin. We provide employment for 300 full time staff and 170 part time/seasonal staff. We hold 22 water take consents with the Waikato Regional Council.

2. Contact Details

Property Owner	Pukekawa Land Company Limited
Contact Person	Brendan Balle
Postal Address	166 Heights Road, RD1, Pukekohe
Contact Phone Number	09 2370880
Person responsible for implementing Farm Plan	Brendan Balle

3. Property Details

Legal description	ALLT 253 Onewhero SD ALLT 254 Onewhero SD LOT 1 DPS 50074 LOT1 DPS 5695 PT LOT 1 DP 4034 PT LOT 1 DP 4034
Valuation number	06310/05400
Total area covered by FEP (ha)	35.66
Effective Area (ha)	35.66
Annual rainfall (mm)	1096 (Pukekohe annual rainfall, 2015)
Soil Type	Patumahoe and Puni soils
Land Use	Rotational crops

4. Land Management Units (LMU)

4.1 LMU – Owned Land	Hectares
Brie01	2.72
Brie02	11.71
Brie03	3.05
Brie04	3.11
Brie05	7.70
Brie06	7.37
4.2 LMU – Leased Land	
Not applicable to this property	

5. Consents

Consent Type	Irrigation
Consent Number	120012
Consented volumes (m3)	Daily:1500 Annual:126000
Consent granted	22/07/2009
Consent expires	01/07/2021

6. Irrigation Details

Irrigated area (ha)	35.66
Irrigation type	Gun and hard hose (manual rotation)

The property is irrigated within the allocated consent volumes and in accordance with good management practices.

7. Erosion and Sediment Control

All erosion and sediment control on the property is carried out in general accordance with the HortNZ Erosion and Sediment Control Guidelines (2014) which stipulate industry best practice standards. Specific details are provided for each Land Management Unit (LMU) within the relevant section of this report.

9. Crop Rotation Details

This section has been left intentionally blank. HortNZ are seeking to develop representative crop rotations. Representative rotations may simplify the crop mix and seasonal variation based on differing intensities and an agreed model, possibly APSIM, can then be used to establish contaminant benchmarks for each representative rotation. Modelling can take into account variations in soil and climate (including rainfall) across different sub-catchments in the region.

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10. Nutrient Budget

This section has been left intentionally blank. HortNZ are seeking to develop representative crop rotations. Representative rotations may simplify the crop mix and seasonal variation based on differing intensities and an agreed model, possibly APSIM, can then be used to establish contaminant benchmarks for each representative rotation. Modelling can take into account variations in soil and climate (including rainfall) across different sub-catchments in the region.

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11. LMU BRIE01

11.1 LMU BRIE01 Farm Map



Figure 2. Map of LMU BRIE01

11.2 Paddock Details

Land area (ha)	2.72
Slope	Rolling
Irrigation type	Gun
Land use	Arable crops and Vegetables
Stream(s) present	To north of site
Wetland(s) present	To north west of site

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	2.26	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	0.46	Puni	Clay	Unlimited	Imperfectly Drained	46%

*All soil information derived from S-Map

11.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	Riparian Planting
N leaching								
P Leaching	5			5	5	5	N/A	4
Runoff	5			5	5	5	N/A	4
Erosion	5			5	5	5	N/A	4
Soil compaction	5			5	5	5	N/A	4

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

11.4 Observations and Recommendations BRIE01



Figure 3. Paddock view of BRIE01

		Priority	Time Frame	GPS Ordinates	Co-	Date Completed
Observation	Site is moderate in slope and appropriately contoured, with banded channels directing all runoff to a sediment trap at lowest point					
Recommendation	No recommendations for sediment control required.					
Observation	A stream runs to the north of this site, traversing retired pastoral land.					
Recommendation	It is recommended that if stock are to be grazed on the pastoral land to the north of this site, then the stream should be fenced off to prevent their access with a minimum 1m setback as slope is less than 15 degrees.	Low	If needed			
Observation	Existing vegetation in excess of 5m bounds stream to the north but is comprised of blackberry and long grasses.					
Recommendation	No recommendations					

11.5 Overview of Sediment Traps on BRIE01

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m³)	Photograph
A	20 x 2 x 2	80	

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12. LMU BRIE02

12.1 LMU BRIE02 Farm Map

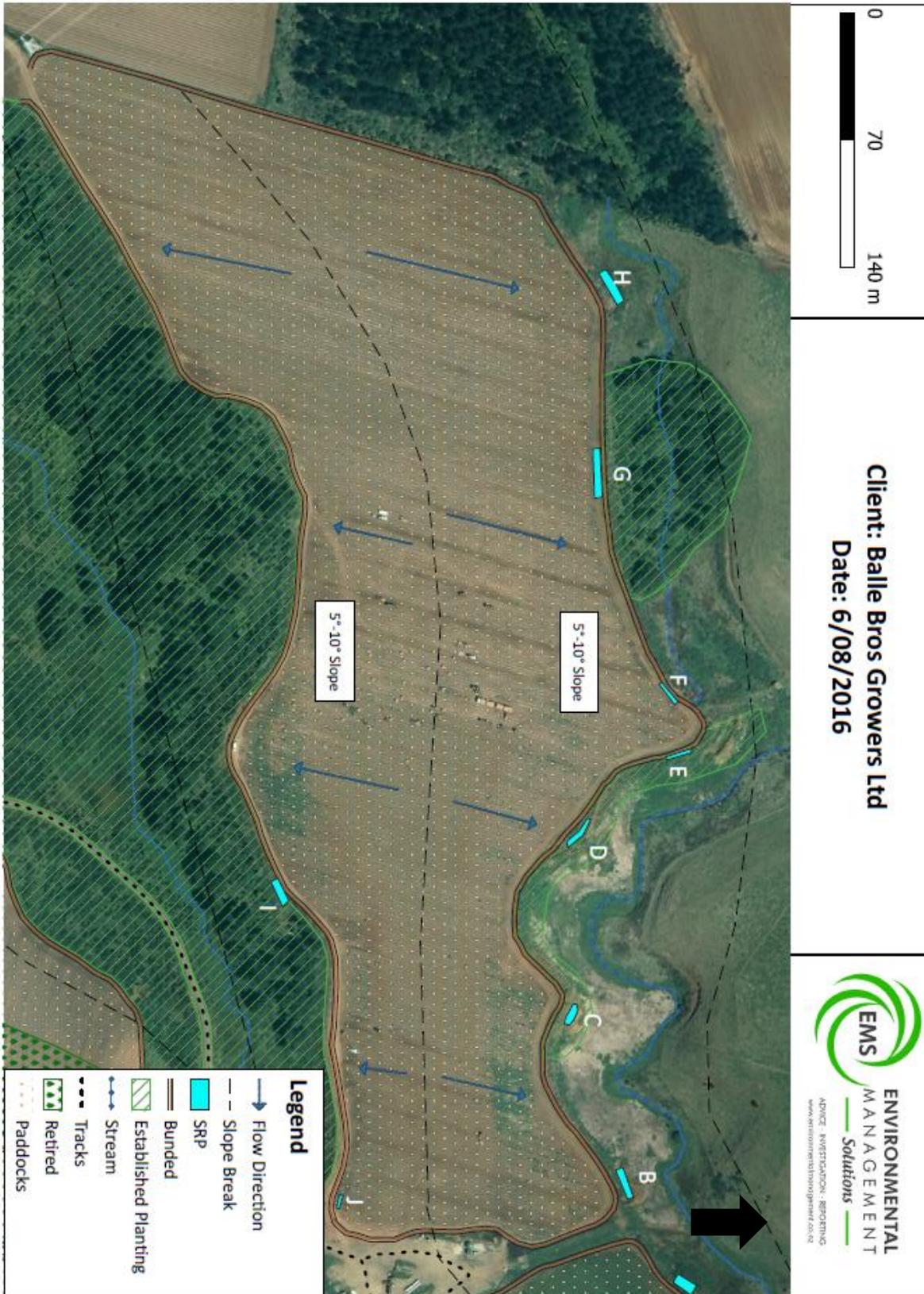


Figure 4. Map of LMU BRIE02

12.2 Paddock Details

Land area (ha)	11.71
Slope	Rolling to moderately steep
Irrigation type	Gun
Land use	Vegetables and arable crops
Stream(s) present	To north and south of site
Wetland(s) present	To south of site

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	7.26	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	4.45	Puni	Clay	Unlimited	Imperfectly Drained	46%

*Soil information derived from S-Map

12.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					Riparian Planting
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	
N leaching								
P Leaching	5	Extensive erosion and sediment control measures on site		5	5	5	5	5
Runoff	5	Channelling and bunding leading to sediment traps present		5	5	4	5	5
Erosion	5			5	5	5	5	5
Soil compaction	5			5	5	5	5	5

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

12.4 Observations and Recommendations

Observation	Priority	Time Frame	GPS Ordinates	Co-	Date Completed
LMU is moderately steep in grade 5-10°. Erosion and sediment controls are well positioned and maintained on site. There are currently nine sediment traps that exist on this site (refer to LMU Map). Excellent management of runoff.					

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Recommendation	No recommendations				
Observation	Extensive established riparian planting to the south of the LMU exists (>10ha). To the north of the site there is a small area of riparian planting between sediment traps G and J. The remainder of the northern boundary is in pasture, with eucalyptus trees planted along the boundary line.				
Recommendation					
Observation	Control of runoff to the west of the site exists, although disperses into paddock at lowest point. Runoff is derived from sediment trap P of MARS03 and also from site TOWN02.				
Recommendation	Sediment trap to be developed in north western corner of LMU BRIE02.	High			
Observation	Three minor breaches in the bund on the southern margin of the site were observed, please refer to LMU Map for locations.				
Recommendation	Recontour bund on southern margin to rectify breaches.	High			-37.322707, 175.005152



Figure 5. Paddock view of BRIE02 (above)



Figure 6. Established Riparian Vegetation on Southern Boundary (right)

12.5 Overview of Sediment Traps on BRIE02

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m ³)	Photograph
B	32 x 2 x 1.5	96	
C	13 x 2 x 1.5	39	
D	22 x 2 x 1.5	66	

<p>E</p>	<p>21 x 2 x 1.5</p>	<p>63</p>	
<p>F</p>	<p>19 x 2 x 1.5</p>	<p>57</p>	
<p>G</p>	<p>16 x 1.5 x 1.5</p>	<p>36</p>	

<p>H</p>	<p>9 x 2 x 2</p>	<p>36</p>	
<p>I</p>	<p>14 x 4 x 1.5</p>	<p>84</p>	
<p>J</p>	<p>10 x 2 x 1.5</p>	<p>30</p>	

13. LMU BRIE03

13.1 LMU BRIE03 Farm Map



Figure 7. Map of LMU BRIE03

13.2 Paddock Details

Land area (ha)	3.05
Slope	Rolling
Irrigation type	Gun
Land use	Vegetables and arable crops
Stream(s) present	To north and south of LMU
Wetland(s) present	To north and south of LMU

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	2.59	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	0.46	Puni	Clay	Unlimited	Imperfectly Drained	46%

*Soil information derived from S-Map

12.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	Riparian Planting
N leaching	4							
P Leaching	4	Small breach in bund evident on northern margin		5	5	4	4	4
Runoff	4			5	5	4	4	4
Erosion	4			5	5	4	5	4
Soil compaction	5			5	5	5	5	4

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

13.4 Observations and Recommendations

		Priority	Time Frame	GPS Co-Ordinates
Observation	Paddock is moderate in slope with two sediment traps for catchment. Majority of site has good channelling, bunding and management of runoff to sediment traps. One breach noted on northern margin requiring repair as depicted on LMU map			
Recommendation	Breach in bund on northern margin requires repair to ensure that all runoff is channelled to sediment trap K. To achieve this, sediment trap K shall be extended 2m to the west.	High		-37.320532, 175.009954

Observation	Watercourse to the south of LMU BRIE03 has in excess of 5m established riparian planting adjoining access way/paddock. Paddock to north has stream, although no riparian planting has been undertaken on this margin. Existing vegetation in this location includes blackberry and long grasses in excess of 5m, making this compliant with WRC PC1 requirements.			
Recommendation	No required recommendations.			

13.5 Overview of Sediment Traps on BRIE03

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m ³)	Photograph
K	19m x 2m x 3m	114	
L	20m x 2m x 2m	80	

14. LMU BRIE04

14.1 LMU BRIE04 Farm Map



Figure 8. Map of LMU BRIE04

14.2 Paddock Details

Land area (ha)	3.11
Slope	Rolling
Irrigation type	Gun
Land use	Forage crops / Arable crops / Vegetables / Pastoral
Stream(s) present	Present to north west and south east of portion of property
Wetland(s) present	No

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	1.90	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	1.21	Puni	Clay	Unlimited	Imperfectly Drained	46%

*Soil information derived from S-Map

14.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	Riparian Planting
N leaching		Steep portion of site requires retiring						
P Leaching	4			5	4	5	5	5
Runoff	4			5	4	5	5	5
Erosion	4			5	5	5	5	5
Soil compaction	5			5	5	5	5	5

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

14.4 Observations and Recommendations

		Priority	Time Frame	GPS Co-Ordinates	Date Completed
Observation	Slope at steep portion of site is in excess of 15° (clinometer assessed to be 20°). This area has been retired. The remainder of the site is low gradient around 2-3° and is suitable for productive use.				
Recommendation	No recommendations				

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Observation	Erosion and sediment controls are well positioned and maintained. Three large sediment traps are located at the base of the paddock. All runoff channelled, banded and directed to sediment traps.				
Recommendation	No further recommendations for erosion and sediment control beyond routine maintenance.				
Observation	Existing well established riparian planting in excess of 5m on the eastern margin protecting adjoining watercourse (See Figure 11).				
Recommendation	No recommendations.				

14.5 Overview of Sediment Traps on BRIE04

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m ³)	Photograph
N			
O			
P			

15. LMU BRIE05

15.1 LMU BRIE05 Farm Map



Figure 9. Map of LMU BRIE05

15.2 Paddock Details

Land area (ha)	7.70
Slope	Flat to rolling
Irrigation type	Gun
Land use	Vegetables and arable crops
Stream(s) present	To south of LMU
Wetland(s) present	No

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	4.85	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	2.85	Puni	Clay	Unlimited	Imperfectly Drained	46%

*Soil information derived from S-Map

15.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	Riparian Planting
N leaching								
P Leaching	5		5	5	5	5	5	5
Runoff	5		5	5	5	5	5	5
Erosion	5		5	5	5	5	5	5
Soil compaction	5		5	5	5	5	5	5

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

15.4 Observations and Recommendations

		Priority	Time Frame	GPS Co-Ordinates	Date Completed
Observation	Slope of paddock is moderate to flat. Bunding and channels provide well defined route for directing runoff. Bunding adjoining the northern margin has several minor breaches leading into gully containing sediment traps. Remainder of site has excellent sediment controls in place.				
Recommendation	Recontour bund to remove minor breaches.	Low			

15.5 Overview of Sediment Traps on BRIE05

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m ³)	Photograph
R	24m x 2m x 0.5m	24	
S	5m x 2 x 0.5m	5	

16. LMU BRIE06

16.1 LMU BRIE06 Farm Map

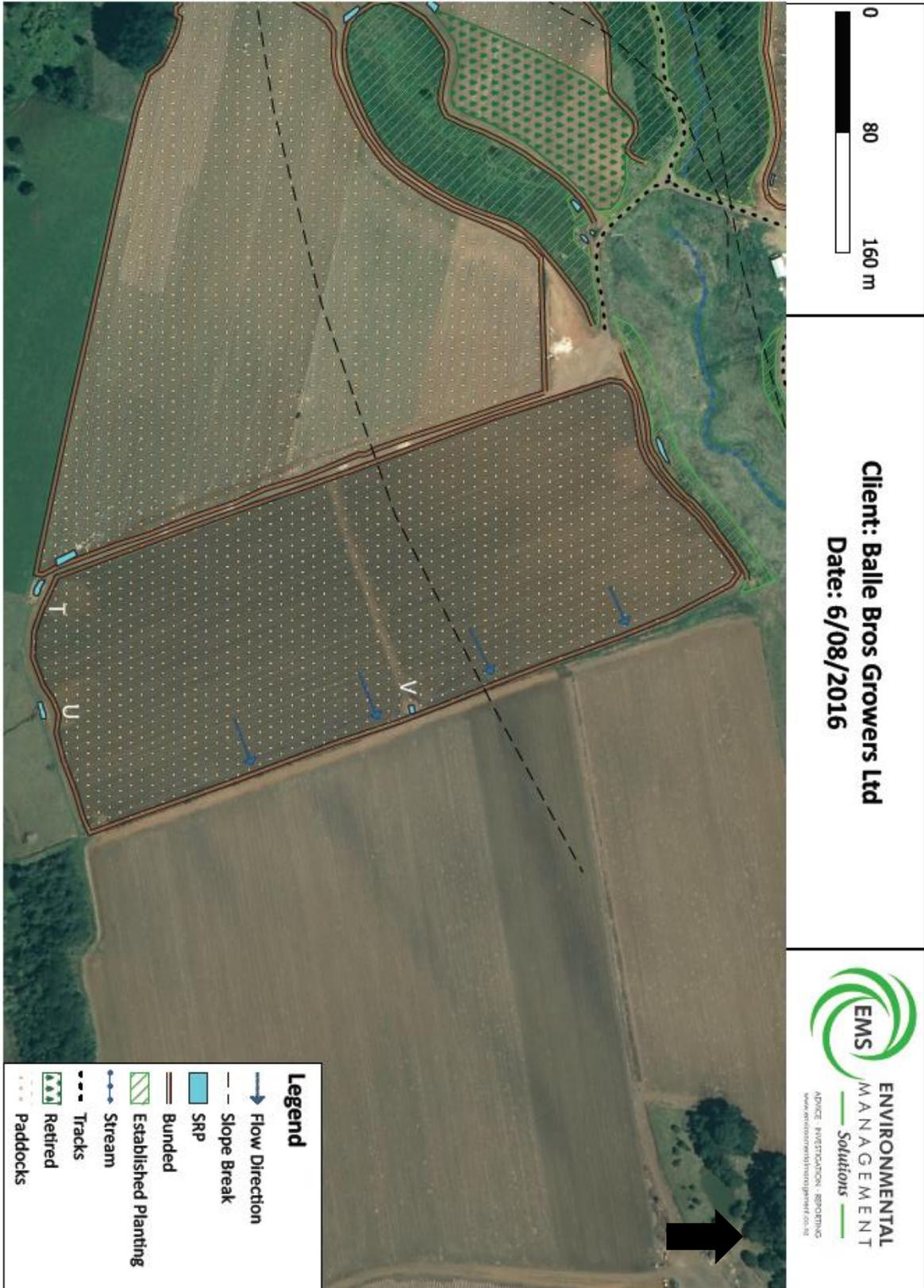


Figure 10. Map of LMU BRIE06

16.2 Paddock Details

Land area (ha)	7.37
Slope	Flat to rolling
Irrigation type	Gun
Land use	Vegetables and arable
Stream(s) present	To south of LMU
Wetland(s) present	No

Soil Information						
S-Map Code	Area (ha)	Soil Series Name	Texture	PRD	Drainage	P Retention
Morr_8a.1	5.82	Patumahoe	Clay	Unlimited	Moderately Well Drained	46%
Puni_1a.1	1.55	Puni	Clay	Unlimited	Imperfectly Drained	46%

*Soil information derived from S-Map

16.3 Environmental Risk Assessment Table

Risk	Existing Risk Overall	Reason	Adequacy of Current Practice					
			Fertiliser Application	Irrigation	Cultivation	Erosion & Sediment Controls and Maintenance	Earthworks	Riparian Planting
N leaching	5							
P Leaching	5			5	5	5	5	4.5
Runoff	5			5	5	5	5	4.5
Erosion	5			5	5	5	5	4.5
Soil compaction	5			5	5	5	5	4.5

*Use a scale of 1 to 5 where 1=risk not managed at all; 5=risk fully managed.

16.4 Observations and Recommendations

		Priority	Time Frame	GPS Co-Ordinates	Date Completed
Observation	Moderate slope on property (refer Figure 15 above). Excellent sediment controls in place, contouring and bunding channels all runoff to a number of sediment traps on site (refer below for summary of sediment traps). Effective bunding and channelling through the middle of the paddock (towards the east) as shown in Figure 16 and table below.				
Recommendation	No recommendations				
Observation	The northern margin of the property has been extensively planted with native riparian vegetation in excess of 5m. A small area (15m) is yet to be planted.				
Recommendation	Remaining area to be planted	Low			

16.5 Overview of Sediment Traps on BRIE06

Sediment Trap	Dimensions (m) (Length x Width x Depth)	Volume (m ³)	Photograph
T	10 x 2 x 1	20	
U	5 x 2 x 1	10	
V	10 x 2 x 0.5	10	

W	4 x 2 x 1	8	
X	18 x 2 x 1.5	54	

17. Summary of Recommendations

LMU REFERENCE	RECOMMENDATION	DATE TO BE ACTIONED
BRIE01/02	If stock are to be grazed adjoining stream then fencing to ensure stock exclusion is required.	Low Priority
BRIE02/03	Sediment trap to be created in the north western corner, to the west of sediment trap J. Size is to be calculated based upon contributing catchment and in accordance with Industry Guidelines.	High Priority
BRIE02/04	Recontour channel and repair minor breaches in bund on southern margin.	Medium Priority
BRIE03/01	Repair breach in bund on northern margin and ensure that all runoff is channelled to sediment trap K.	High Priority
BRIE05/01	Recontour channel and bund along the north western margin of site to repair minor breaches in bund.	Low Priority

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