Central Victorian Livestock Exchange

Central Victorian Livestock Exchange (CVLX)

Contingency Effluent Disposal Report

June 2015

RLX
Regional Livestock Exchanges

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This report has been prepared by the office of Spiire

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Acknowledgements and Recognition

Stephen Carter – Central Highlands Water

Martin Haege – Geolyse Pty. Ltd.

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Contents

1. Introduction

RLX Investment Company Pty Ltd, as trustee for RLX Investment Trust (RLX IC), proposes to relocate the Central Victorian Livestock Exchange (CVLX) from its existing site in central Ballarat to the north-west outskirts of the city. This move will allow the development of a state-of-the-art facility that will provide livestock marketing and saleyard services for the Ballarat district and extending further into central Victoria.

The facility will include domestic sewer facilities, along with wash-down facilities which will generate effluent to be managed. The effluent system proposed for the facility is on site treatment and disposal through a septic system, lagoons and on site irrigation.

There is approximately 26.5 ha available for re-use on site which is sufficient for the projected treated effluent volume.

The purpose of this report is to identify potential methods of disposal as a contingency or alternative to onsite disposal of effluent.

Spiire Australia Pty Ltd have been engaged by RLX IC to provide feasibility advice in relation to the cost and options of the disposal of surplus or contingency effluent from site.

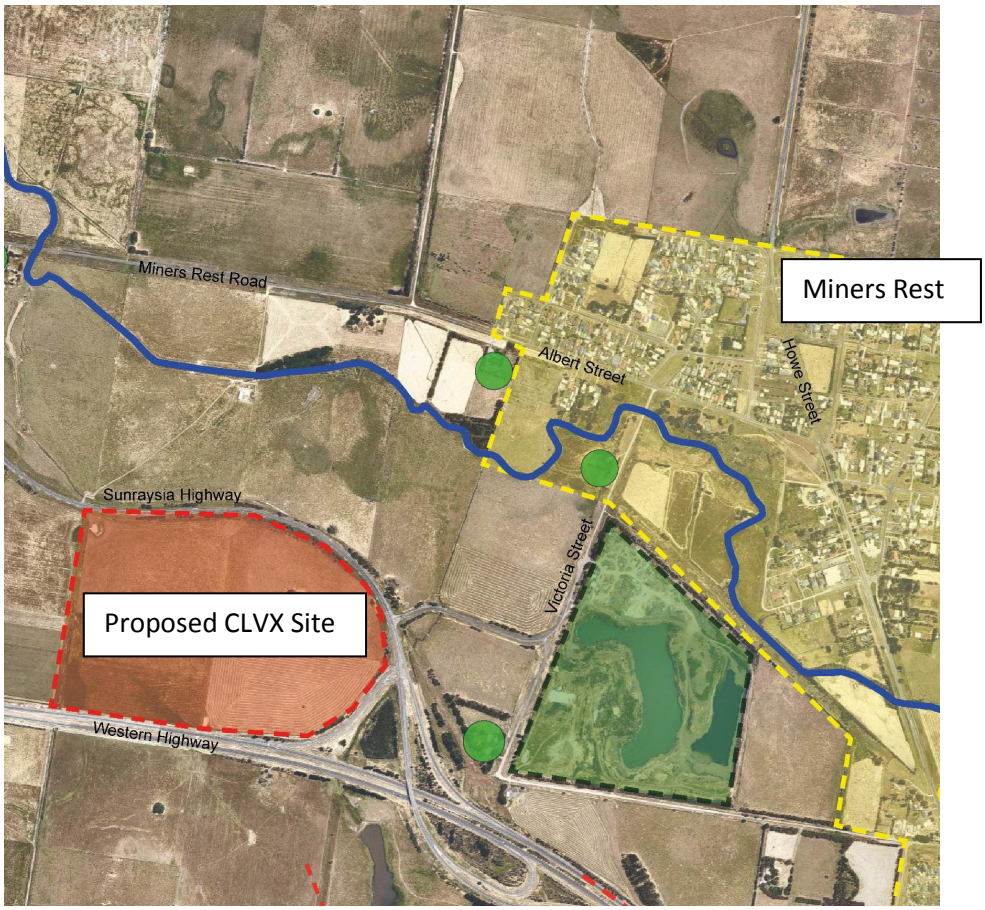

Figure 1 – Site Location Plan

2. Effluent Volumes

Advice received from Geolyse Pty. Ltd. Indicates that the overall discharge expected from the development is 33.7ML per annum, with average daily flows being in the order of 92.5KL per day (Refer Figure 2).

Source	Annual Volume, ML/year	Average daily kL/day	Peak Daily kL/day
Domestic	0.9	2.5	5.8
Truck wash/wash down	32.8	90	986

Figure 2 – Discharge Table

3. Disposal Options

The proposed development has been determined to be capable of management of waste water on the land itself. The proposed irrigation system is subject to a detailed monitoring regime. The following options are identified as alternatives in the event that the monitoring detects that the land is not capable of sustained irrigation of part or all of the waste water generated.

In all offsite disposal options, it is assumed that on-site treatment is provided such that effluent complies with Central Highland Water required parameters. This may be provided through the incorporation of coagulant dosing and clarification into the treatment process.

3.1 Option A - Pumping Minor Flows

This option provides for pumping a percentage of daily flows back into Central Highland Waters sewer reticulation system. The amount of flows pumped would be such that the remaining effluent to be discharged on site does not exceed the lands capacity to take up the effluent.

It has been assumed that a constant effluent volume would be drawn off to reduce the annual volume of onsite discharge by 25%. Based on 25% of the annual volume of truck wash down discharge (0.25x32.8ML), being pumped over 365 days, a daily discharge requirement of approximately 22.5kL/day is required. When the average daily domestic discharge (2.5kL/day) is included, a total daily discharge required is calculated to be 25kL/day.

Central Highlands Water indicate that the relatively low flows (25kL/day) could be discharged into the existing reticulation system in the area of Cummins Road, approximately 2.5km east of the site.

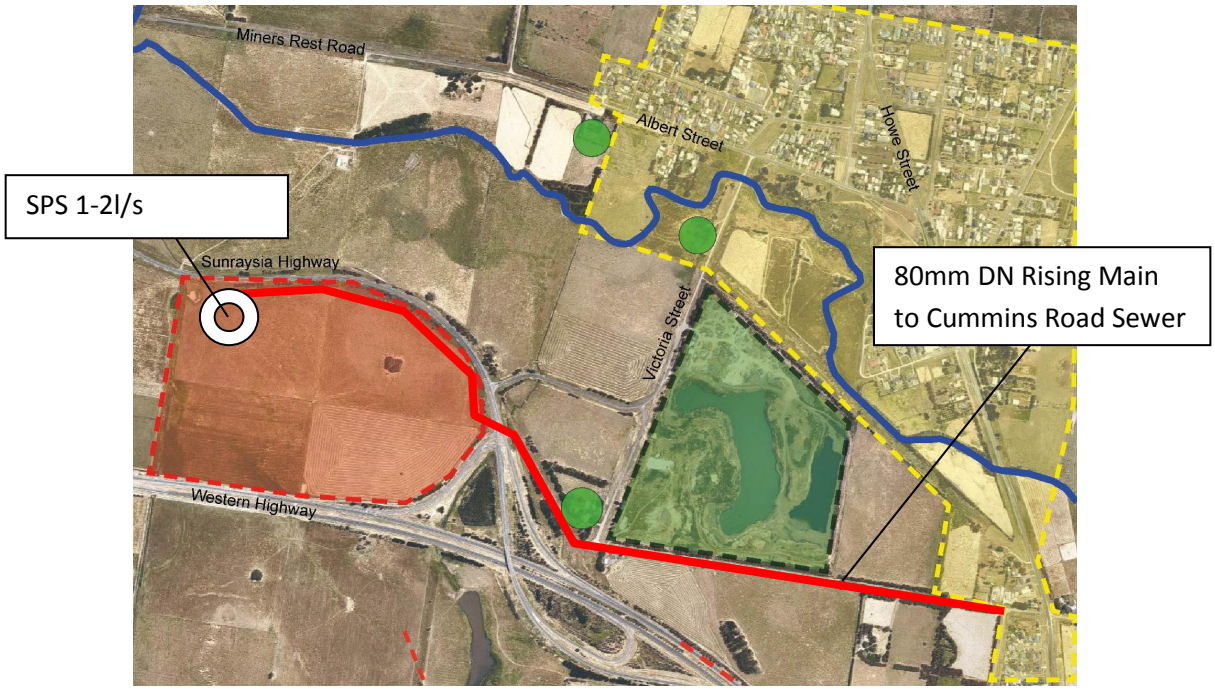

Figure 3 – Pumping Minor Flows Alignment

A small pre-packaged pump station could be installed on site to pump flows via a rising main of approximately 80mm diameter, to the existing sewer reticulation in Cummins Road. The flow rate of discharge would be in the order of 1-2l/s pumping at a head of approximately 20m.

Indicative feasibility estimate cost of such a system are in the order of $676,000 (Refer Figure 4).

High Level Estimate Total				**$675,896**
Item	Quantity	Unit	Rate	Amount
Prefabricated Pump Station	1	No	$25,000	$25,000
On Site Treatment	1	No	$75,000	$75,000
80mm diameter rising main (internal)	840	lm	$80	$67,200
80mm diameter rising main	1660	lm	$200	$332,000
Road Crossings	2	No.	$5,000	$10,000
Electrical connection	500	lm	$50	$25,000
Connecting pipework	200	lm	$50	$10,000
Subtotal				$544,200
Contingency			15%	$81,630
Fees			8%	$50,066
Construction Estimate Total				**$675,896**

Figure 4 – Minor Pump Capital Costs

3.2 Option B – Truck Collection and Disposal

On the basis of flow reduction outlined in Option A above and on site treatment being provided to meet CHW discharge parameters ($100,000 approximate capital cost), an alternative to adopting a pump system would be to have a daily collection of 25kL/day by a vacuum truck system, and disposed of at the treatment plant site.

Large vacuum trucks have the capacity to take 25kL, as such a single load per day could be collected.

Costs associated with collection and disposal are in the order of $800 per load (25kL) or $208,000pa excluding trade waste disposal charges.

Central Highlands Water Trade waste charges are currently in the order of 40c per KL + $135/kg for BOD and $135/kg Suspended Solids.

3.3 Option C - Additional Land Irrigation

This option has not formed part of Spiires engagement and has not been investigated at this time, however it is an option that CVLX could explore through discussion with adjoining land owners to expand the irrigation area to match land areas to capability, as determined by the ongoing monitoring regimes (and subject to testing of additional sites), to allow for contingency discharge requirements.

3.4 Option D - No Onsite Disposal

Should RLX IC consider a complete alternative to onsite disposal, a sewerage pump station could be adopted to transfer all effluent from the site to Central Highland Water's sewer reticulation system.

Peak flows generated from the site including wash-down flows are in the order of 1000kL/day with average daily flows estimated at approximately 95kL/day. To reduce the capacity requirements of a pump station, it is assumed that onsite storage could be provided to provide a buffer for peak flows.

This would reduce the capability requirement of the pump station to approximately 250kL/day with the average discharge being in the order of 95kL/day.

Central Highland Water has indicated that to discharge this volume into the reticulation network, a connection point to the existing system would be required at the Maryborough Pumpstation No. 2 site, approximately 4 km south east of the site (Refer figure 5).

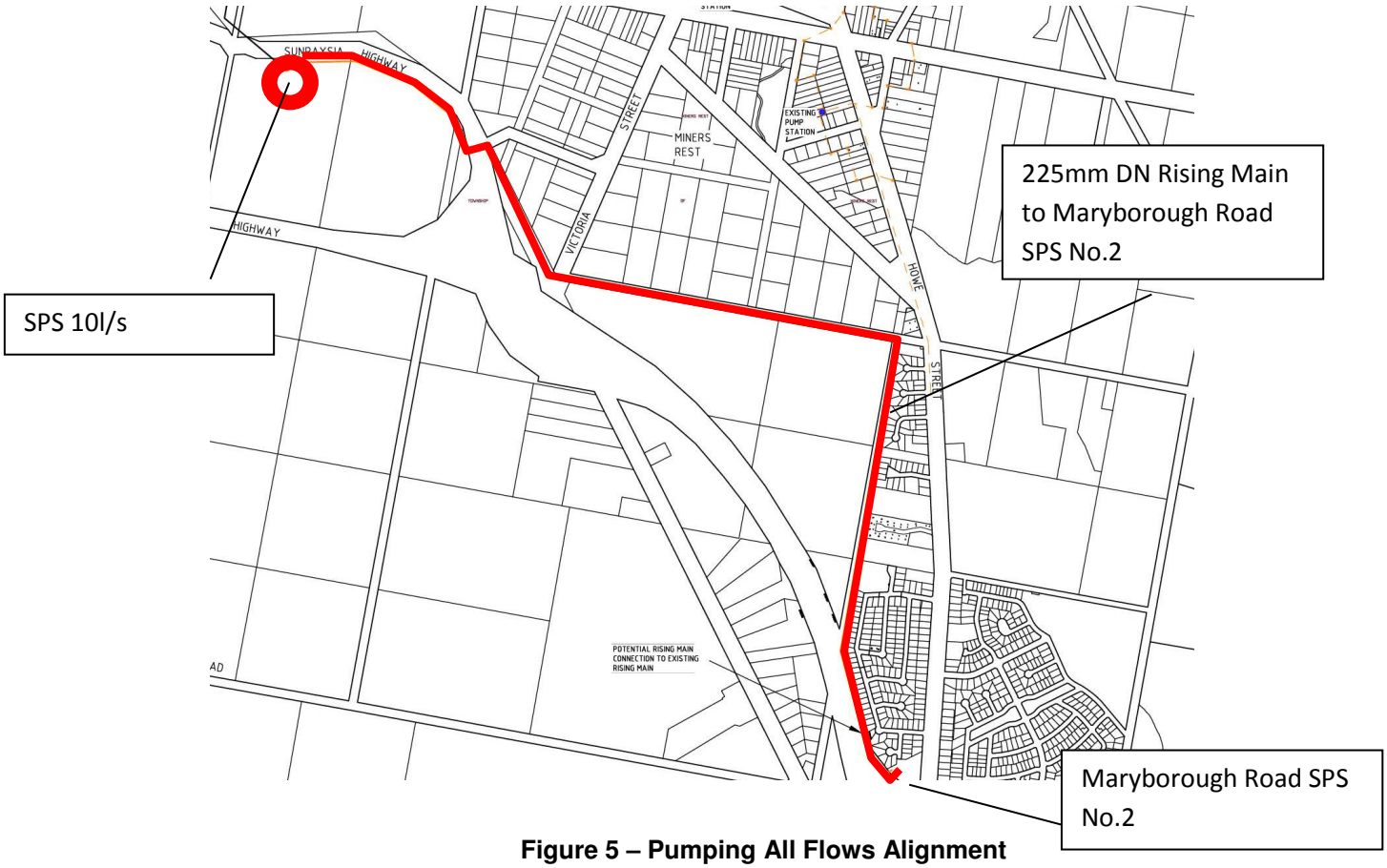

Figure 5 – Pumping All Flows Alignment

Indicative feasibility estimate costs of such a system are in the order of $1.44M.

Item	Quantity	Unit	Rate	Amount
Prefabricated Pump Station	1	No	$60,000	$60,000
On Site Treatment	1	No	$75,000	$75,000
150-225mm diameter rising main (internal)	840	lm	$150	$126,000
150-225mm diameter rising main	3360	lm	$250	$840,000
Road Crossings	3	No.	$8,000	$24,000
Electrical connection	500	lm	$50	$25,000
Connecting pipework	200	lm	$50	$10,000
Subtotal				$1,160,000
Contingency			15%	$174,000
Fees			8%	$106,720
Construction Estimate Total				**$1,440,720**

Figure 6 – Major Pump Capital Costs

4. Conclusion

There are various options to handle contingency or surplus effluent flows from the proposed livestock exchange should ongoing monitoring determine this an appropriate outcome. Ultimately if contingency disposal is required, the options should be weighted in the following order of preference:

1. Option C: Additional Irrigation offsite on adjacent land
2. Option A: Offsite disposal via pump station of regular minor flows ($0.68M)
3. Option D: Offsite disposal via pump station of all flows ($1.44M)
4. Option B: Truck Collection ($0.10M + $208,000 p.a)

Given the level of investment required to deliver the CVLX is in the order of $25M, all methods of disposal form a small percentage (approximately 6% at worst for Option D, or 3% for Option A) of the overall costs and as such the management of surplus and/or contingency flows should not be deemed to be a constraint to the viability of the development of the site.