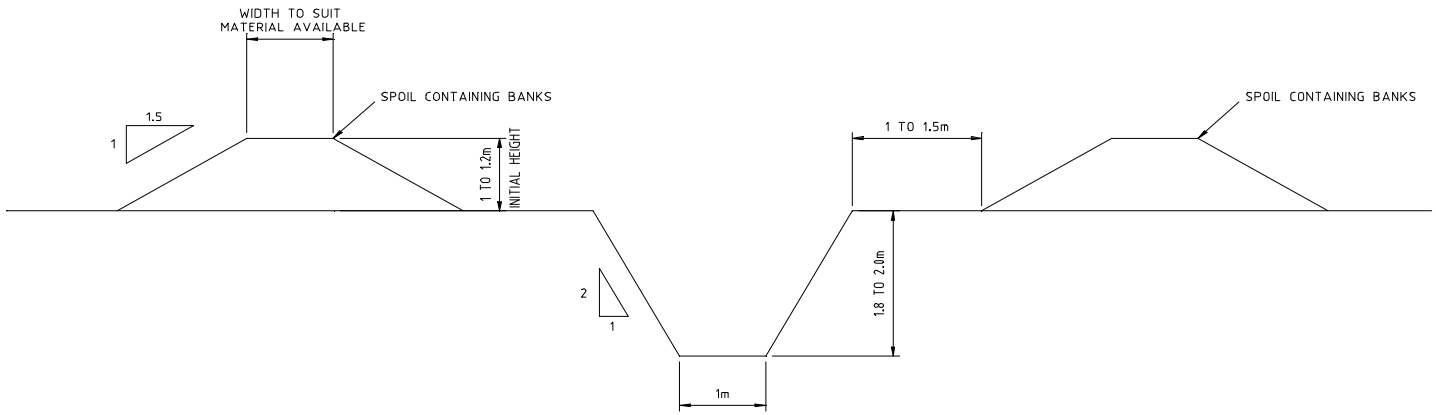
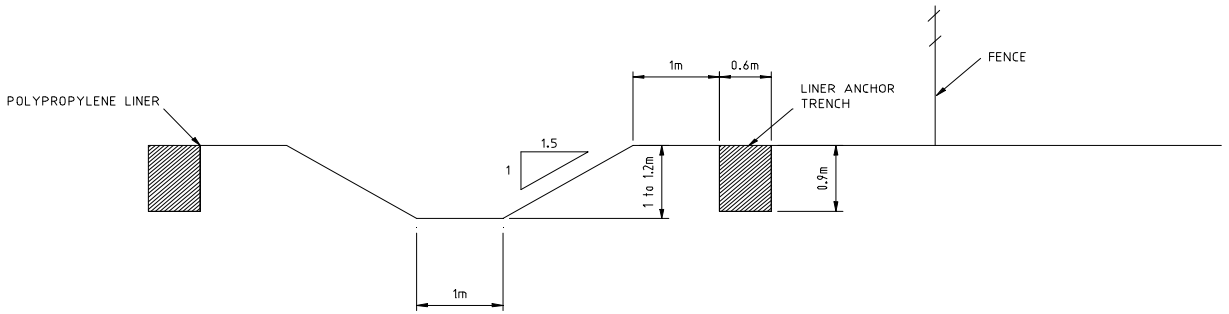


UNLINED DRAIN - PROPOSED SECTION



LINED DRAIN - TYPICAL SECTION

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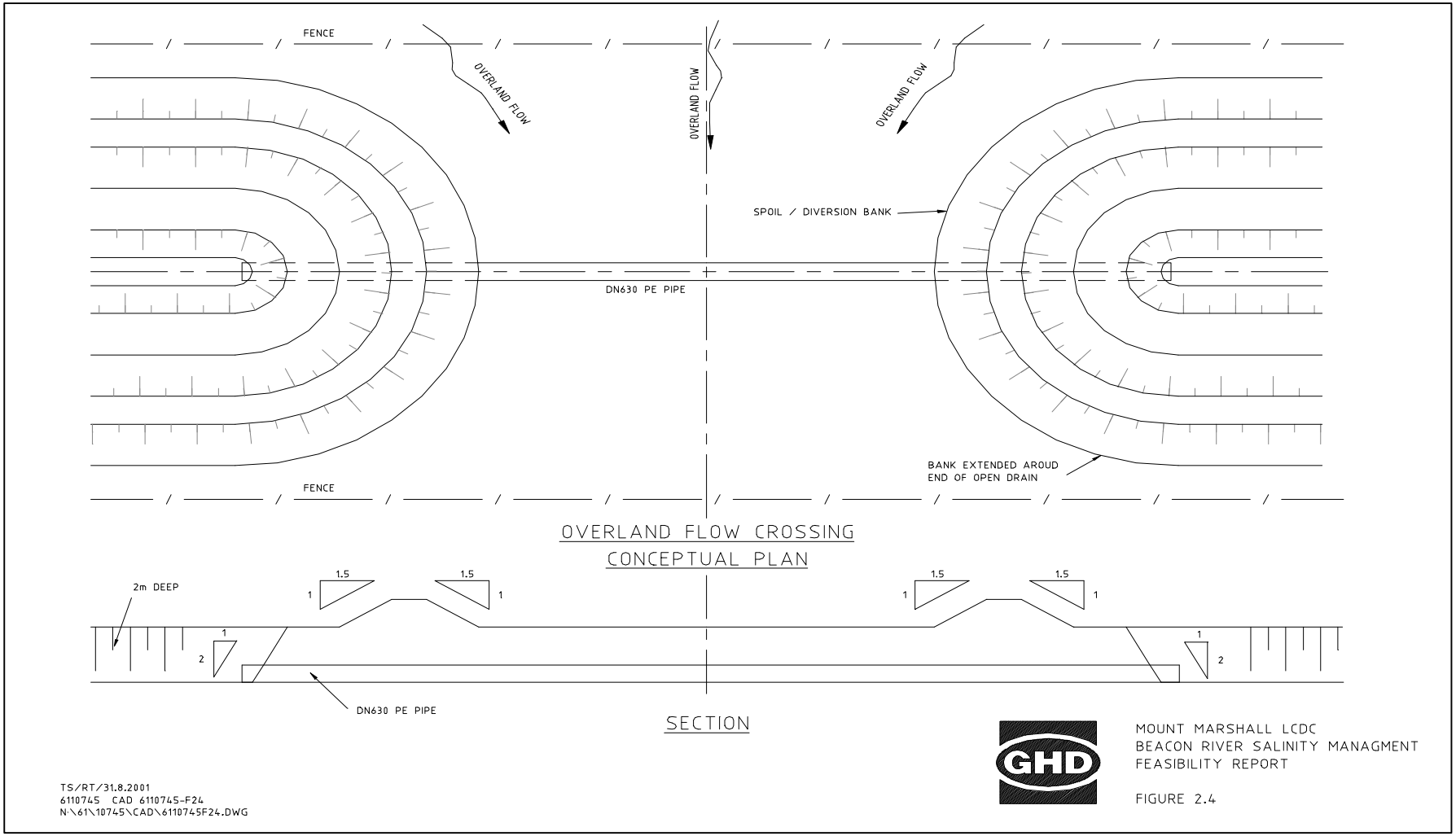
MOUNT MARSHALL LCDC
BEACON RIVER SALINITY MANAGMENT
FEASIBILITY STUDY

FIGURE 2.1



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FEASIBILITY REPORT

FIGURE 2.4

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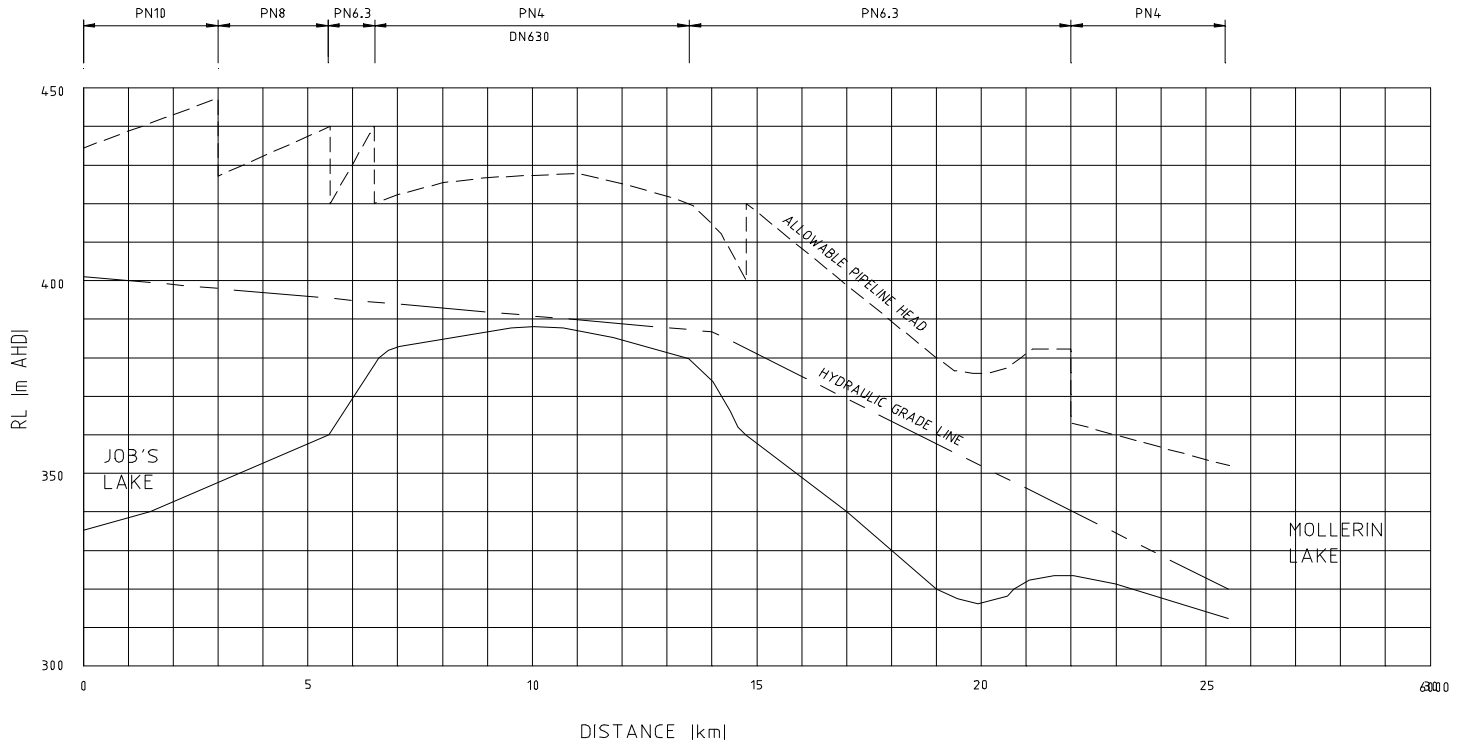
Table 4.1.1: Purpose of and proposed actions for engineering scheme options

Schemes	Scheme 1 (Figure 4.2.1)	Scheme 2 (Figure 4.3.1)	Scheme 3 (Figure 4.4.1)	Scheme 4 (Figure 4.5.1)	Scheme 5 (Figure 4.6.1)
Purpose	a) Remove existing flood water in Job's Lake only, to increase the flood attenuation capacity of the lake. b) Reduce the seepage entering Job's Lake and lower the groundwater tables upstream of the lake.	a) EXTEND the Scheme 1 DRAIN from Job's Lake to the Shire boundary. b) Leave the existing flood waters in Job's Lake to evaporate naturally. c) Reduce the baseflow components (seepage) entering the main salt lakes, by draining upstream sections of the main channel route and diverting the drainage around the lakes.	a) DRAINAGE is the same as for Scheme 2 (Scotsman Road to Shire boundary). b) Keep Job's Lake dry to increase the lake's flood attenuation capacity. c) Keep the costs for removing water from Job's Lake to a minimum in terms of capital expenditure (CAPEX) costs.	a) DRAINAGE same as for Scheme 2 and Scheme 3 (Scotsman Road to Shire boundary). b) Keep Job's Lake dry to increase the lake's flood attenuation capacity. c) Adopt a more permanent, but more costly option for removing water from Job's Lake.	a) DRAINAGE from Dalgouring Road to Shire boundary. b) Keep Job's Lake dry to increase the lake's flood attenuation capacity. c) Adopt a more permanent, but more costly option for removing water from Job's Lake. d) Proportion and control release of saline water to potential disposal sites INSIDE the catchment .
Actions	a) Pump water from Job's Lake to Mollerin Lake. b) Install a drain from about Scotsman Road INTO Job's Lake.	a) Install a drain from about Scotsman Road to Job's Lake. b) Extend the drain from Job's Lake to the Shire boundary, BYPASSING Job's Lake.	a) Install a drain from about Scotsman Road to Job's Lake (Section 1). b) Extend the drain from Job's Lake to the Shire boundary, BYPASSING Job's Lake. c) PUMP the water from Job's Lake into the downstream sections of the catchment drain using a temporary pump facility (hire basis). d) REPEAT the PUMP OUT exercise following flood events with ARI's of greater than about 1 in 10 years. e) **No specific disposal options included**.	a) Install a drain from about Scotsman Road INTO Job's Lake. b) Construct an outlet structure and channel through the topographic divide below Job's Lake. c) Extend the drain from Job's Lake to the Shire boundary. d) RELEASE the water from Job's Lake into the downstream section of the catchment drain. e) REPEAT the RELEASE exercise following flood events with ARI's of greater than about 1:10 years. **f) No specific disposal options considered.**	a) Install a drain from about Scotsman Road INTO Job's Lake (Section 1). b) Construct an outlet structure and channel through the topographic divide below Job's Lake. c) Extend the drain from Job's Lake to the Shire boundary. d) RELEASE the existing flood water from Job's Lake into the downstream section of the catchment drain. e) REPEAT the RELEASE exercise following flood events with ARI's of greater than about 1 in 10 years. f) Proportion and release excess saline water downstream of Job's Lake into Askew's Lake and/or the McDermott Lakes complex. g) Proportion excess saline water downstream of the McDermott Lakes complex to salt lakes and/or an evaporation basin.

Table 4.1.2: Considerations related to the engineering scheme options

Schemes	Scheme 1 (Figure 4.2.1)	Scheme 2 (Figure 4.3.1)	Scheme 3 (Figure 4.4.1)	Scheme 4 (Figure 4.5.1)	Scheme 5 (Figure 4.6.1)
Engineering and Hydrology	a) Pumping to Lake Moore is further and more expensive than pumping to Mollerin Lake. b) Installing a pipeline to Mollerin Lake for a once-only emptying of Job's Lake would be an expensive option. c) Drain water collected in Job's Lake will evaporate naturally, during average and low rainfall periods.	a) NO allowance for disposal inside the catchment, i.e. regional arterial drainage option with disposal outside the catchment. b) Drainage upstream of Job's Lake should reduce the baseflow component to Job's Lake. c) Job's Lake should dry out naturally in 5-10 years, if there are no major floods in this period.	a) A pipe or lined drain would be required for a distance of about 11km's downstream of Job's Lake to prevent saline water from raising water tables along this section. b) Drainage upstream of Job's Lake should reduce seepage into the lake. c) The lake should remain dry during average rainfall years. d) Job's Lake should only require emptying once every 10-20 years, if climatic conditions do not change rapidly in the short term.	a) Significant surface flows are typically only generated by rainfall events larger than an ARI of 1:10 years, which means pump-out facilities should only be required approximately once every 10 years. b) A temporary generator and pump facility for disposal to downstream sections of the catchment drain should therefore be adequate to cater for these events.	a) A sluice gate type release facility and outflow channel to join the downstream section of the catchment drain is a relatively expensive option, purely for flood control. b) There is a risk that this facility could become redundant except for releasing flood waters from ARI events of greater than 1:10 or even 1:20 years.
Environmental Impacts	a) Impacts of disposal at Mollerin Lake would be insignificant. Most of the water will evaporate and land adjacent to the lake should not be affected. b) Conveyance should be via buried pipeline therefore minimal environmental damage will occur along pipeline route.	a) Only the areas immediately adjacent to the drains would be permanently impacted. b) The drain corridor would need to be fenced and grassed following construction. c) The drain route would be optimised to keep environmental impacts to a minimum.	a) A piped drain has the advantage of being buried with less disturbance to agricultural production, but is more expensive than an surface unlined/lined drains. b) Impacts associated with transfer of saline water downstream would be insignificant, as much of the route is already impacted by salts and shallow groundwater tables.	a) Impacts related to pumping into a bypass drain should be insignificant. Minor disturbance would take place along the short length of the pipe route linking Job's Lake to the bypass drain. b) Downstream environmental impacts should be insignificant, as much of the route is already impacted by salts and shallow groundwater tables.	a) Excavation of an outlet channel would result in permanent environmental impacts for that section of the conveyance route. b) The outlet section would require fencing, grassing and erosion protection. c) Disposal in local salt lakes should have negligible environmental impacts. d) Salt in the lakes would need to be regularly harvested e) Flooding and overtopping of the salt lakes should have negligible downstream environmental impacts.



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MOUNT MARSHALL LCDC
BEACON RIVER SALINITY MANAGMENT
PROFILE OF PROPOSED DELIVERY PIPELINE
JOB'S LAKE TO MOLLERIN LAKE
FIGURE 4.2.2