DWLBC REPORT

Pike - Murtho Numerical Groundwater Model 2006

Volume 1 - Report and Figures

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Government of South Australia
Department of Water, Land and Biodiversity Conservation

Pike – Murtho Numerical Groundwater Model 2006

Volume 1 – Report and Figures

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Knowledge and Information Division
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FOREWORD

South Australia's unique and precious natural resources are fundamental to the economic and social wellbeing of the State. It is critical that these resources are managed in a sustainable manner to safeguard them both for current users and for future generations.

The Department of Water, Land and Biodiversity Conservation (DWLBC) strives to ensure that our natural resources are managed so that they are available for all users, including the environment.

In order for us to best manage these natural resources it is imperative that we have a sound knowledge of their condition and how they are likely to respond to management changes. DWLBC scientific and technical staff continues to improve this knowledge through undertaking investigations, technical reviews and resource modelling.

Rob Freeman
CHIEF EXECUTIVE
DEPARTMENT OF WATER, LAND AND BIODIVERSITY CONSERVATION

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During the development of the Border to Lock 3 numerical groundwater model numerous discussions were held regarding model fundamentals, technical issues and progress with Mr Don Armstrong of Lisdon Associates, who also undertook a review of the model and report.

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EXECUTIVE SUMMARY

The Pike – Murtho irrigation area is located in the Riverland region of South Australia on the eastern side of the River Murray near Renmark. Concerns have been raised regarding the salt load impacts on the River Murray and floodplains resulting from irrigation development. Previous assessments included development of numeric groundwater models, which indicated that salt loads would rise significantly in future years in the Pike – Murtho area, even without development of new irrigation, as result of the long lag time for irrigation drainage water to reach the 40–50 m deep water table.

The original pre-development base salt load entering the river is estimated (from the latest model results) to be around ~32 t/day in the Murtho area and around ~63 t/day in the Pike area. Run of River (ROR) surveys in recent years estimate that up to ~89 t/day of salt enters the River in the Murtho area (between river km 564–620) and ~150 t/day in the Pike area (between river km 529–563). Much of the additional salt load results from the increased flux of saline groundwater that occurs in response to the development of irrigation drainage groundwater mounds.

The Department for Water, Land and Biodiversity Conservation (DWLBC) first developed a MODFLOW numerical groundwater flow model (Border to Lock–3 Model) from the SA–VIC border to Woolpunda area in South Australia (Yan et al. 2005) in 2003. This model covers the entire Riverland area, including the Pike – Murtho project area (Fig. 1). The objectives of this initial modelling project were to develop a model capable of simulating the regional aquifer system in the Riverland area that could be used to:

- Improve the understanding of the hydrogeology of the regional aquifer system and processes in the model area.
- Predict the flux of saline groundwater and salt load entering the River Murray under different accountable development and management actions (100 year predictions from current year), hence provide modelled salt loads for use as Salinity Register entries.
- Assist with broad scale planning of conceptual SIS well field designs targeting the Loxton Sands and Monoman Formation, and predict the reduction in the salt load entering the River Murray.

In late 2004, Resource and Environmental Management Pty Ltd (REM), in partnership with Aquaterra Simulations Pty Ltd (Aquaterra), was commissioned by DWLBC to update the Border to Lock 3 model in the Pike – Murtho area and use the model to develop a concept design for a Salt Interception Scheme (SIS). After transferring the model back to DWLBC late in September 2005, DWLBC have made significant improvements to the model throughout the Pike and Murtho region that address the issues raised by Salient Solutions (2005) and REM-Aquaterra (2005b). The fundamental objective of the modelling work undertaken has been to improve confidence in the model parameters and results to levels that will enable and assist:

- Accreditation of the model by the MDBC.
- Use of modelled salt loads as Salinity Register entries.
- Refinement of the current SIS design beyond conceptual to ‘preliminary’ levels.

After improved calibrations were made, the transient model was used to run scenarios which have produced estimates of the groundwater fluxes (and resultant salt load) entering the River Murray resulting from accountable irrigation and management actions. The scenarios are summarised in Table ES–1 and predicted salt loads entering the River Murray are summarised in Tables ES–2 and ES–3.

Table ES–1. Summary of modelling scenarios

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920–2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988–2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988–2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988–2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005–2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005–2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005–2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme. (see Glossary for definitions)

Table ES–2. Summary of predicted salt load (t/day) entering the River Murray (Murtho Area)

Murtho Area	Year				
	1988	2000	2005	2050	2105
S–1	32.0	32.0	32.0	32.0	32.0
S–2	32.7	32.9	33.0	34.0	39.8
S–3A	99.5	123.6	135.2	278.3	300.9
S–3B	99.5	123.5	103.0	140.4	138.2
S–3C	99.5	123.5	103.0	140.4	138.2
S–4	99.5	123.5	103.0	174.0	234.7
S–5	99.5	123.5	103.0	174.0	389.0
S–6	99.5	123.5	103.0	29.6	76.0

Table ES–3. Summary of predicted salt load (t/day) entering the River Murray (Pike Area)

Pike Area	Year				
	1988	2000	2005	2050	2105
S–1	63.5	63.5	63.5	63.5	63.5
S–2	65.8	67.0	67.8	75.1	88.1
S–3A	149.7	160.9	165.6	226.4	237.6
S–3B	149.7	160.3	149.8	152.6	156.1
S–3C	149.7	160.3	149.8	152.6	156.1
S–4	149.7	167.1	156.0	181.2	192.7
S–5	149.7	167.1	156.0	188.9	250.3
S–6	149.7	167.1	156.0	63.4	74.9

Note: The Pike area saltloads presented in this report represent fluxes from the highland area only and do not include the estimated ~30 t/day from the Pike-Mundic floodplain.

1. INTRODUCTION

In late 2004 the Department for Water, Land and Biodiversity Conservation (DWLBC) commissioned Resource and Environmental Management (REM) and Aquaterra Simulations (Aquaterra) to refine an existing DWLBC numeric groundwater model (Border to Lock 3 model). The work was undertaken to assist the conceptual design of Salt Interception Schemes (SIS) in the Pike and Murtho regions of the South Australian Riverland. The refined model provided quantitative estimates of salt loads entering the River Murray under a range of past and future land and water use conditions. This work was reported by REM and Aquaterra (2005a and b) and used by DWLBC to prepare an Approval Submission to the Murray Darling Basin Commission (MDBC) for obtaining approvals and funding for commencing SIS construction.

Accreditation of the groundwater model by the MDBC is required as part of the approval process for the Pike and Murtho SIS. The MDBC commissioned an independent review of the groundwater model by Salient Solutions (2005). Completed in October 2005, this review recommended that:

- Salt load estimates from the model not be used as Salinity Register entries.
- Further work be undertaken by South Australia (SA) to address model issues related to calibration performance in the Lyrup, Simarloo and Mid-Pike areas, salt loads in terms of the long-term averages as seen in the River and those modelling recommendations made by REM and Aquaterra (2005b).

Since September 2005, DWLBC have made significant improvements to the groundwater model throughout the Pike and Murtho region that address the issues raised by Salient Solutions (2005) and REM-Aquaterra (2005b). The fundamental objective of the modelling work undertaken has been to improve confidence in the model parameters and results to levels that will enable and assist:

- Accreditation of the model by the MDBC.
- Use of modelled salt loads as Salinity Register entries.
- Refinement of the current SIS design beyond conceptual to ‘preliminary’ levels.

This report summarises the model changes and extensively documents the model inputs and outputs in a format that will assist completion of the MDBC review and accreditation process. The report has two volumes:

- Volume 1 – Report and Figures, which contains the report and key figures depicting the project area and model structure and parameters.
- Volume 2 – Appendices, which contain detailed model inputs (recharge zones and rates) and outputs of groundwater flux and salt loads for the various scenarios modelled.

1.1 POLICY BACKGROUND

In 2001, the Murray Darling Basin Ministerial Council approved the publication of the Basin Salinity Management Strategy 2001–2015 (BSMS). Similarly, the South Australian Government adopted the River Murray Salinity Strategy 2001–2015 in 2001. These initiatives

followed the adoption of the Ministerial Councils' Salinity and Drainage Strategy 1988 (S&DS), taking into account the 1999 Basin Salinity Audit and the National Land and Water Resources Audit.

The objectives of the BSMS are to:

1. Maintain water quality of the shared water resources of the River Murray and River Darling.
2. Control the rise in salt loads in all tributary rivers of the Murray-Darling Basin.
3. Control land degradation and protect important terrestrial ecosystems, protect farmland, cultural heritage and built infrastructure.
4. Maximize net benefits from salinity control across the Basin.

Under the S&DS, 1 January 1988 was adopted as a baseline from which any subsequent actions that affected River Murray salinity were the responsibility of the State in which the action occurred. One of the main components carried forward from the S&DS was the system of salinity credits and debits, however changes were made to the manner in which credits and debits were entered on the Salinity Registers. Under the 1988 Strategy, debits and credits were entered as the impact at 30 years. Within the BSMS, entries onto the register are the average of the 30 years, with the maximum impact in 100 years also recorded. The BSMS allows for any action resulting in an increase in river salinity, such as new irrigation developments, to occur, provided that salinity credits, gained by contributing to the funding of salt interception schemes or other measures, are available to offset any salinity debits arising from these accountable actions.

The S&DS has significantly reduced salinity in the River Murray through implementation of salt interception schemes and improved land and water management. The target of restricting river salinity at Morgan below a threshold of 800 EC at least 95% of the time is close to being met. However, the 1999 Salinity Audit highlighted that the future impacts of salt mobilisation, due to further irrigation developments and the effects of dryland salinity, would diminish the achievements of the S&DS unless further action was taken. Consequently, the BSMS commits the partner governments to an initial seven-year investment program of salinity mitigation works and measures to be implemented across the Murray Darling Basin to deliver 61 EC credits to the river and to offset the States accountable actions.

There are currently five operational salt interception schemes within SA (Woolpunda, Waikerie, Waikerie IIA, Qualco – Sunlands Groundwater Control Scheme and Bookpurnong). The Loxton SIS is currently under construction and further scheme extensions are being investigated in the Woolpunda – Cadell reach near Waikerie.

In presenting the combined Pike and Murtho schemes to Ministerial Council for approval in September 2005, SA proposed a credit allocation and cost-sharing methodology on the basis of the model results of the various pre-and post-1988 actions undertaken in each of the areas. The assessment of those impacts is required to be consistent with the reporting requirements of both Schedule 'C' of the Murray-Darling Basin Agreement 1992 and the Basin Salinity Management Strategy Operational Protocols 2005.

SA proposes to implement SIS within the Pike – Murtho region in a staged manner, commencing in the southern and central parts of Murtho.

1.2 INVESTIGATION BACKGROUND

The Pike – Murtho irrigation area is located in the Riverland region of South Australia on the eastern side of the River Murray, from near Renmark, upstream to the Victorian border (Fig. 1).

Annual "Run of River" surveys, undertaken since 1985, provide estimates of salt load impacts to one-kilometre reaches of the River Murray based on in-stream Electrical Conductivity (EC) measurements (Porter, 2001). Results from recent years are summarised in Table 1 for the Pike and Murtho reaches. In Figure 2, in-stream Transient Electro-Magnetics (TEM) results, in which reds and oranges can be interpreted as either materials containing more saline groundwater (or as more clayey sediments) and greens and blues can be interpreted as material containing groundwater of a lower salinity than elsewhere, indicate the potential locations of saline groundwater entering the River Murray. Estimates using both of these techniques incorporate saline groundwater accessions from both sides of the River Murray and notably include a large salt load from the Chowilla floodplain as measured in the River Murray immediately downstream of the confluence of Chowilla Creek.

Table 1. Run-of-River in-stream salt load estimates

Year	**Salt Load** (t/day)	
	Murtho (River km 620–564)	**Pike** (River km 563–529)
1997	86	92
1998	61	77
2001	67	118
2002	71	130
2003	40	53
2004	43	66
2005	59	44
2006	39	67
Average	58	81

The REM-Aquaterra (2005a) review of Run of River data for the period from 1991–2004 indicates that on average, 72 t/day of salt is discharged from the Pike River Anabranch to the main River channel and the salt load from the Murtho irrigation area is around 39 t/day.

Detailed investigations of the surface and groundwater systems of the Pike and Murtho region commenced in the mid- to late 1990s. These included work by Primary Industries (1995), BC Tonkin and Associates (1997, 1998) and Woodward-Clyde (1998a,b). This work was incorporated into further hydrogeological assessments of the Pike River and Murtho Land and Water Management Planning (LWMP) areas by REM, on behalf of the Renmark to Border Local Action Planning Association (REM 2002a,b). These assessments included development of a numeric groundwater model, which indicated that around 197 t/day of salt was discharging from the Pike LWMP area (highland and floodplain areas) and that about 31 t/day was discharging from the Murtho LWMP area to the River Murray. The model results also indicated that salt loads would rise significantly in future years in the Murtho LWMP area, even without development of new irrigation, as result of the long lag in time for irrigation drainage water to reach the 40–50 m deep water table. The work by REM identified

groundwater management strategies to mitigate the rising salinity impacts from dryland clearing and irrigation development and recommended further targeted investigations to allow more detailed assessment of such strategies (REM 2002b).

DWLBC contributed to the acquisition of new hydrogeological data and improved understanding in 2004 when 25 monitoring wells and four production wells were installed and aquifer-tested within the water table aquifer in highland areas throughout the Pike and Murtho region (Stadter, 2005) Some stratigraphic drilling of floodplain areas (by air-core drilling) was also undertaken by DWLBC and REM in late 2005.

In late 2004, DWLBC commissioned REM and Aquaterra to update the conceptual hydrogeological model of the region and then refine an existing DWLBC numerical groundwater model (Border to Lock 3 model) to assist with SIS concept design. This work was documented and reviewed as outlined in the opening paragraphs of this Section (1).

In general terms, SIS design needs to resolve the following surface and groundwater issues:

1. A clear understanding of the magnitude of the flux and salinity of groundwater entering the River Murray.
2. The sections of the river reach in which major fluxes of saline groundwater (salt loads) occur.
3. The aquifer(s) that should be targeted for SIS.
4. The hydraulic relationships between the targeted aquifer(s) and adjoining aquifers.
5. The hydraulic relationship between the aquifers and the river.

In September 2005, DWLBC received the groundwater model files from Aquaterra and commenced the process of making changes and revisions to the model in light of the recommendations made by REM-Aquaterra (2005b) and Salient Solutions (2005).

In December 2005, DWLBC commenced a field program to install monitoring and production wells to resolve data gaps and enable refinement of the SIS concept design. This work was undertaken only within the southern and central parts of the Murtho region, where staged construction of the Murtho SIS was planned to commence. Some results of this work (eg Salinity of groundwater and hydraulic conductivity from pumping test) have also been incorporated into the model changes made and documented by DWLBC in this report.

The revised model results have been incorporated into a new Approval Submission for the Murtho SIS, currently under preparation by the Infrastructure and Business Division (IBD) of DWLBC.

2. HYDROGEOLOGY AND HYDROLOGY OF THE PIKE – MURTHO AREA

2.1 LOCATION

The Pike Murtho irrigation area is located in the Riverland region of South Australia on the eastern side of the River Murray near Renmark. The Pike River and Murtho Land and Water Management Plan areas together occupy ~700 km^2 from the Old Customs house near Chowilla in the North, to Gordon road below the Pike River in the south (Fig. 1). They are bounded by the River Murray to the west and the South Australia – Victorian border to the east. The Pike River is an anabranch of the River Murray located to the southeast of Renmark. It begins just above Lock 5 near Paringa and rejoins the main river near Lyrup where the pool level is ~13.2 m AHD. The Pike River borders the degraded Pike-Mundic floodplain that is filled with a complex network of anabranches, lagoons and backwaters. The Pike-Mundic floodplain occupies ~50 km^2 adjacent the river channel where the transition between floodplain and the highland (denoted as being above the 1956 flood level or ~25 m AHD) can be steep where cliffs have formed along the Pike River. Similar geomorphology exists in Murtho, with the Woolenook Bend Complex being the major floodplain of significance locally (Stadter, 2005).

2.2 CLIMATE

The Riverland climate is typically characterised by hot dry summers and cool, wetter winters. The mean rainfall in Renmark since 1889 is around 260 mm per annum, with an annual evaporation rate of ~1750 mm on average (Bureau of Meteorology, 2006).

Cumulative deviation of annual rainfall from the mean (not shown in this report) shows that since the high rainfall years of the 1970s, a trend of below-average annual rainfall has been predominant (REM-Aquaterra, 2005a).

2.3 REGIONAL HYDROGEOLOGY

The Murray Basin is a closed groundwater basin containing Cainozoic unconsolidated sediments and sedimentary rock up to 600 m in thickness, and contains a number of regional aquifer systems (Evans and Kellet, 1989).

Within the study area, there are three major aquifer systems of significance (see hydrogeological cross section in Fig. 3). In the highland areas a perched water-table can occur within the Woorinen Formation above the Blanchetown Clay, whilst the water-table aquifer proper occurs in the underlying Loxton Sands (hydraulic conductivity typically 1–5 m/day). This aquifer forms a regionally extensive unconfined to semi-confined aquifer into which the channel of the ancestral River Murray is incised. Within this channel, the semi-confined Monoman Formation (likely to have highly variable hydraulic conductivity) has been

deposited, and it is within this sequence that the modern channel of the River Murray is incised. The Loxton Sands aquifer and the Monoman Formation aquifer are considered to be in direct hydraulic communication.

At the Pike-Mundic and Woolenook floodplains the groundwater table can occur within the overlying surficial sediments of the Coonambidgal Formation, and the Bookpurnong Beds aquitard separates the Monoman Formation aquifer from the underlying Murray Group Limestone aquifer. A hydrostratigrahic table is given in Appendix C–1 (Stadter, 2005).

Within the Pike River and Murtho Land and Water Management Plan areas, the groundwater flow direction in all aquifers of interest is generally towards the River Murray. The river and its anabranches behave as a sink for regional groundwater in the study area.

Saline groundwater enters the floodplain environment through one of three mechanisms:

- Lateral flow from the Loxton Sands aquifer.
- Slow upward leakage through the Bookpurnong Beds aquitard (REM 2002b estimated a vertical hydraulic conductivity of 10–5 m/day) from the underlying regional confined Murray Group Limestone aquifer.
- Seepage from cliff faces found at the break of slope.

Discharge subsequently occurs either directly to the River Murray (or one of its backwaters or anabranches) through the Loxton Sands or Monoman Formation aquifer, or through evapotranspiration. Typical rates of evapotranspiration from the floodplain are 250 mm/yr (REM-Aquaterra, 2005a). With reference to upward leakage from the Murray Group Limestone, REM-Aquaterra (2005a) concluded “upward gradients are interpreted to exist across the project area providing a potential for the upward movement of groundwater from the Murray Group Limestone. However, the rate of upward leakage is expected to be low (relative to other vertical fluxes) because of the presence of a thick confining layer (combination of Lower Loxton Clays and Bookpurnong Beds).” It was also noted that “The project steering committee for this project has agreed that the Murray Group Limestone unit is unlikely to make a significant contribution to the salt load to the River Murray relative to the Loxton Sands aquifer on the basis that the Lower Loxton Clay – Bookpurnong Beds aquitard provides a barrier to vertical flow. Consequently, structure contours and isopachs are not presented for the various sub-units that lie within the Murray Group.”

As anecdotal evidence indicates that only minor seepage occurs from cliff faces in the study area, it can be seen that lateral flow from the Loxton Sands aquifer is the main mechanism for saline groundwater discharge to the River Murray. It should also be noted that within the study area, there is no evidence at this point that the River Murray is in direct contact with the Murray Group Limestone, unlike the reach immediately downstream of Loxton, where erosion of the Bookpurnong Beds has created a direct connection of the River Murray with the underlying Murray Group Limestone.

It is the above two points which confirm that the Loxton Sands and Monoman Formation aquifers contribute the majority of the salt load to the River Murray, and thus are the targets for salt interception in the Pike Murtho region.

The schematic diagram of the Pike Murtho conceptual hydrogeological model is presented in Figure 4 (after REM-Aquaterra, 2005a). The figure highlights the regional groundwater flow conditions, direction and leakage between the various hydrogeological units.

2.4 HYDROGEOLOGICAL UNITS

Each of the various hydrogeological units shown in Appendix C–1, are discussed in order of increasing depth below ground surface in the following sections.

2.4.1 WOORINEN FORMATION

The Woorinen Formation provides a thin capping of Quaternary sediments across the highlands of the project area between 2–5 m thick (REM-Aquaterra, 2005a). It should also be noted that sequences of roughly the same thickness have been deposited due to aeolian deposition on the Pike Mundic Floodplain, on top of existing Coonambidgal clay. In highland areas, the Woorinen Formation regularly contains multiple hard calcrete horizons, which can often cause difficulties to digging equipment such as front-end loaders.

Whilst the Woorinen Formation may experience localised perched groundwater tables, predominantly in areas with a reasonably thick sequence of Blanchetown Clay and higher recharge rates due to irrigation, they are not of great significance in the context of groundwater modelling undertaken for SIS design.

2.4.2 COONAMBIDGAL FORMATION

The Coonambidgal Formation clay layer occurs ubiquitously across the floodplain and comprises clay and silts deposited during periods of episodic flooding (Yan et al. 2005).

Floodplain air-core drilling carried out by REM in December 2004 indicated that whilst the unit was commonly 2–4 m thick, it could vary in thickness anywhere from 1–9 m across the Pike–Mundic and Woolenook floodplains. It is likely that similar to floodplains in the Loxton and Bookpurnong regions, the greater thicknesses would be observed at or near the break in slope between the floodplain and highland.

2.4.3 MONOMAN FORMATION

Beneath the Coonambidgal clay and above the regional aquitard of the Lower Loxton Clay/ Bookpurnong Beds, lies the Monoman Formation.

Typically, the Monoman Formation comprises a mixture of channel and sheet sand deposits with intervening sequences of silty clay. This is likely to result in highly variable transmissivity throughout the floodplain similar to that encountered in the Loxton Bookpurnong investigations. Floodplain air-core drilling carried out by REM in December 2004 included the Pike-Mundic, Woolenook Bend, and Gurra Gurra floodplains. Drilling revealed that the thickness of the Monoman Formation ranges between 7–19 m (REM-Aquaterra, 2005a).

The data from the air-core drilling program also indicated that the Monoman Formation also tended to become thicker towards the north, coupled with the possibility of an increase in the likelihood of the Monoman Formation being directly on top of the Loxton Sands. This would thereby increase the total aquifer thickness upstream, however it is noted that visually it is very difficult to identify the boundary at the bottom of the Monoman Formation.

In May and June 2006, DWLBC conducted two aquifer tests in the Monoman Formation in Murtho to provide further inputs to the numerical model. Details of this testing will be reported separately by DWLBC.

There are not sufficient data to reliably construct groundwater elevation contours for the Monoman Formation aquifer for the entire length of the floodplain within the project area. However, there are observations regarding groundwater flow in the floodplain aquifers between Lock 10 and Lock 5, which are likely to be relevant to the project area. The primary observation within the REM (2003) study was that regional scale flow through the floodplain aquifers is complicated by interaction with weir pools, groundwater mounds in irrigation areas, localized evapotranspiration and interaction with surface water. It is expected that all of these processes will be relevant to the project area (REM-Aquaterra, 2005a).

REM-Aquaterra (2005a) combined groundwater levels measured in 2004 in shallow wells on the Pike-Mundic floodplain with survey elevations for backwater banks (provided by DWLBC) to produce a groundwater elevation contour plan for part of the floodplain that lies between the Pike River and the River Murray. The contours infer that groundwater flows from the northeast portion of the floodplain to the Pike River between Simarloo and Mid-Pike, potentially resulting in a significant salt load to the Pike River through the highly permeable Monoman Formation (REM-Aquaterra, 2005a). This salt load has been estimated by the model but is not included in final model results presented in this report (discussion in section 4.4.1).

There is insufficient information available for the floodplain south west of Rumpagunya Creek to infer groundwater flow directions (REM-Aquaterra, 2005a) on the Pike-Mundic floodplain. Appendix C–2 shows the locations of the various control points and surface water features within the Pike-Mundic floodplain.

The main drivers on groundwater flow within the Pike Mundic floodplain would appear to be regulation of surface water upstream of Col Col Embankment and use of various stop banks on the backwaters in the upper part of the system. The quantity of groundwater that discharges to the Pike River will depend on the difference in levels between groundwater and surface water. It is likely this relationship is dynamic and that changes to river levels will influence the volume of groundwater discharged. REM (2002b) showed (based on limited data) that groundwater levels on Pike floodplain rise and fall in a pattern similar to fluctuations in the lower pool level at Lock 5 (REM-Aquaterra, 2005a).

Due to its semi-unconfined nature and hydraulic connection, the potentiometric surface for the Monoman Formation for September 2005 has been merged with the Loxton Sands and is presented in Figure 5. This is discussed in further detail in section 2.4.5.

2.4.4 BLANCHETOWN CLAY

The Blanchetown Clay aquitard occurs sporadically throughout the region and due to its laucustrine environment of deposition can grade from a silty soft unit with poor plasticity and low density right through to a hard, dense clay with high plasticity.

The Blanchetown Clay is absent across the floodplain and in large areas to the northwest of Renmark. The clay is also absent in discrete pockets along the eastern side of the River. Thickness of the Blanchetown Clay, where present, ranges from 15 m in the north of the project area, thinning southwards, to ~5 m near the township of Berri (REM-Aquaterra, 2005a).

2.4.5 LOXTON SANDS

The Loxton Sands have been eroded across the floodplain but are present throughout the highland areas, often exposed in cliff faces within the project area. The Loxton Sands generally comprise three main lithofacies: (1) an Upper Loxton Sand facies dominated by pale yellow/grey medium to coarse grained sand; (2) a Lower Loxton Sand facies dominated by greyish coarse grained sand and gravel; and (3) a Lower Loxton Shells facies dominated by remnant fossiliferous shell beds. It is difficult to confirm the lateral extensiveness of each facies across the project area (particularly the Lower-Loxton Shells), as driller's descriptions of lithology in many of the older wells fail to identify these three facies variants. Additionally, one of the recent wells (Unit Number 7029–2016) drilled by DWLBC during the 2004 program did not intersect the Lower Loxton Shells facies, indicating that this unit is not necessarily continuous across the project area. The recent drilling program carried out by DWLBC clearly differentiated the various facies units within the Loxton Sands. The need to distinguish these units is important. Although the Lower Loxton Sands (as a whole) is generally considered to be a less permeable unit than the Upper Loxton Sand, the "upper" part of the Lower Loxton Sand in the Pike-Murtho region contains well-sorted marginal marine sands that grade downward to the finer Lower Loxton Clay (REM-Aquaterra, 2005a).

Based on DWLBC logs the sand and gravels within the upper part of Lower Loxton Sand are around 20 m thick in the Murtho area and 10 m thick in the Pike River area. Any potential salinity mitigation strategy for the highland area is likely to target the upper part of the Lower Loxton Sands because of the favourable hydraulic properties, the relatively large saturated thickness and the elevation of this sub-unit with respect to river pool levels. The top of the Loxton Sands group sits at an elevation of more than 60 m AHD in the northeast portion of the project area and 20 m AHD in the southwest portion of the project area beneath Berri township. Similarly, these sediments thin along a northeast / southwest axis. Thickness ranges from greater than 80 m in the northeast part of the project area to ~30 m in the southwest portion of the project area beneath Berri (REM-Aquaterra, 2005a).

A September 2005 potentiometric surface map has been produced by DWLBC for the Monoman and Loxton Sands aquifers and is presented in Figure 5 (some values have been inferred). Features of the contour map include the clearly defined irrigation mound at Lyrup, and 'initial' development of mounds in the Simarloo and Murtho (17.5 m interval not shown) regions. The groundwater flow direction at Murtho is predominantly to the west, whilst to the south of Paringa, it is generally towards the nearest discharge point, being the Pike River, River Murray or Gurra Gurra Lakes. Contours on the floodplain may not be accurate due to lack of reliable data and numerous boundary conditions, which exist due to the extensive system of permanent anabranches and backwaters present.

2.4.6 BOOKPURNONG BEDS

The Lower Loxton Clay and the Bookpurnong Beds, whilst recognised as discrete stratigraphic units, form the major confining bed throughout the region separating the Murray Group Limestone and Loxton Sands aquifers. This confining bed primarily dips gently along a southwest / northeast axis. South of Renmark towards Berri, the top of the sediments reach an elevation of 0 m AHD beneath the River but dip to an elevation of -25 m AHD to the east and -15 m AHD to the west. A maximum thickness of 30 m (e.g. at Simarloo) is attained in

this sequence of sediments south of Renmark, thinning to the north and west of the project area to 10 m (REM-Aquaterra, 2005a).

2.4.7 MURRAY GROUP LIMESTONE

As mentioned in section 2.3, REM-Aquaterra (2005a) reported that due to the fact that the Murray Group Limestone aquifer is unlikely to contribute a significant salt load to the River Murray in comparison with the Loxton Sands aquifer, the various sub-units that exist within the Murray Group Limestone may be packaged together for numerical modelling pursuits.

It is likely that the majority of the observation wells completed in the Murray Group Limestone are completed in the Pata Formation, simply due to the fact that it is the first aquifer unit intersected within the group.

REM-Aquaterra (2005a) created structure contours for the top of the Murray Group litho facies (Pata Formation) and found that the sediments are generally dipping along an approximate southwest / northeast axis. In the southwest part of the study area near Lock 4 the elevation of the top of the Murray Group is ~-15 m AHD, dipping down to an elevation of ~-50 m AHD near Lindsay Point.

Contours of potentiometric groundwater elevation for the Murray Group Limestone (as close to September 2005 as possible) are presented in Figure 6. Regional groundwater flow (based on the 5 wells used to generate the contour plan) occurs from the east to west and east to southwest.

The groundwater contours suggest that the Murray Group Limestone does not interact significantly with the river or the groundwater mounds within the Loxton Sand (REM-Aquaterra, 2005a).

2.5 SUMMARY OF AQUIFER TEST RESULTS

REM-Aquaterra (2005a) presented a table of all aquifer test results at the time of writing in the study area, as shown in Appendix C–3.

The primary conclusion from the aquifer tests relevant to this project is that the Lower Loxton Sands aquifer can behave as a semi–confined aquifer. Leakage occurs either downward from the Upper Loxton Sands aquifer or upward from the Lower Loxton Clays. It seems reasonable to expect a semi-confined response given that the screen intervals on the observation wells are generally small (6–9 m) in comparison to the saturated thickness of the Loxton sands aquifer (a unit with variable lithology). Hydraulic conductivity values with the range of ~1–5 m/d for the Lower Loxton Sands aquifer would seem representative (REM-Aquaterra, 2005a).

At the time of writing there had only been one pump test analysed for wells completed in the Monoman Formation in the Pike-Murtho region (which yielded a hydraulic conductivity of 18 m/d) however there has been at least 37 tests of the same nature conducted in the Loxton-Bookpurnong area floodplain aquifers.

Howles and Smith (2005) reported that the Monoman Formation (on the 3 major floodplains adjacent to Loxton) has a:

- Transmissivity (generally) of 50–600 m^2/day, with the most frequent value 100–200 m^2/day, however there may be ancient channels where the transmissivity may be much higher.
- Hydraulic conductivity of 10–120 m/day, with the most frequent value 30–40 m/day.
- Storage coefficient (generally) of 1e-4–1.4e-3, with the most frequent value 4e-4–8e-4, however there are areas where the storage coefficient may be higher.

It is likely that the floodplains in both the Pike and Murtho regions experience hydraulic conductivity values over the entire range as above, due to the nature of the depositional environment. In fact, in both these regions where the floodplains can be significantly wider, there may be deeper palaeo-channels of coarser sediments which give even higher conductivity values than those measured at Loxton.

In May and June of 2006, DWLBC completed two pumping tests on floodplains in Murtho to help fill these data gaps and give confidence to the numerical model parameters used. No preliminary results are available at present to compare with model parameters. These results and the results from two subsequent highland aquifer tests will be reported separately be DWLBC.

2.6 GROUNDWATER SALINITY

In August of 2006, DWLBC conducted a salinity review of all Loxton Sands wells completed in the Pike-Murtho study area. This included 6 new highland wells and 13 floodplain wells (completed in the Monoman Formation), which were drilled as part of the 2005–06 aquifer-testing program conducted by DWLBC. Historic data from microfiche was revisited and all wells were classified on the quality of data available.

Areas adjacent to the River Murray were created to group wells according to the numerical models' flow budget zones (with flow budget zones grouped together by salinity value assigned), which had previously been assigned salinity values through a similar but less formalised, iterative approach as new data was obtained. Figure 7 shows the derived model flow budget zones and the salinities that were applied in the model.

Wells on the highland, and wells occurring between potential discharge areas (significant surface water features) and the highland were the focus of the review to provide indicative salinity values expected of groundwater discharging to the River Murray. All salinity data within the Pike Murtho region are shown in Appendix C–4 and Mean and Median salinity values calculated for each allocated area in Murtho are shown in Appendix C–5. Appendixes C–6 and C–7 show the salinity data investigated in both the Murtho and Pike regions respectively, and the areas created adjacent to the numerical models' flow budget zones for Murtho.

It should also be understood that prior to DWLBC completing the 2005–06 drilling and aquifer testing there were no monitoring wells in the Murtho region that were definitively completed in the Monoman Formation. Most, if not all wells drilled in the Murtho region prior to 2005 (on the floodplain), have been completed within sandy lenses of the Coonambidgal Formation for various water level requirements.

Mr Don Armstrong (Lisdon Associates) subsequently conducted a statistical analysis on the observed salinity data, in comparison with an analysis he had already completed on the frequency distribution of groundwater salinity in the model budget zones. This is discussed further in Section 7.2.

Groundwater salinity in the Pike River area tends to be slightly elevated, with several wells showing salinity values in excess of 50 000 mg/L (e.g. Mid-Pike and Simarloo regions. REM-Aquaterra, 2005a). These higher salinities reflect the natural evapoconcentration of groundwater flowing just beneath the surface of topographical depressions to the southwest of the Mid-Pike area.

Salinity in the Lyrup area tends to be lower than in the Pike River and ranges from 5000–30 000 mg/L. The generally lower salinity values in the Lyrup area may be due to the presence of a developed groundwater mound consisting of relatively fresh irrigation drainage water. This effect can be seen in the Ral Ral irrigation area (near Renmark) where there are many salinity values less than 5000 mg/L (REM-Aquaterra, 2005a).

There are few groundwater salinity values for the Murray Group Limestone aquifer. There is a wide range in salinity from 10 000 to greater than 50 000 mg/L TDS. The highest salinity value (greater than 50 000 mg/L) occurs near the Mid-Pike area (REM-Aquaterra, 2005a).

2.7 REGIONAL HYDROLOGY

Where shallow hydraulic gradients exist towards groundwater discharge points in the form of surface water features, it is obvious that surface water elevations play a critical component in terms of how much groundwater will be discharged. Therefore a thorough understanding of the regional hydrology is required of the study area.

REM-Aquaterra (2005a) compiled the summary of the major surface water features with corresponding surface water elevations, as shown in Appendix C-8.

The weirs at locks 4, 5 and 6 provide the primary controls on the water level in the main river channel. The elevation between the upper weir pool at lock 6 (near the upstream extent of the project area) and the upper weir pool at lock 4 ranges from 19.2–13.2 m AHD. Surface water control structures are in-place on some anabranches. REM (2002a) described how the various structures such as weirs and banks within the Pike River area may control groundwater flow over the stranded Pike-Mundic floodplain. The major control on groundwater flow appears to be the one-to-two metre difference in pool level above Col Col embankment (fed from the upper pool of Lock 5) and the pool level downstream of Col Col embankment. This difference between pool levels may drive groundwater flow to the lower reaches of the Pike River and the River Murray (REM-Aquaterra, 2005a).

3. MODEL CONSTRUCTION

3.1 MODFLOW AND VISUAL MODFLOW

MODFLOW is a three-dimensional finite difference mathematical code that was developed by the US Geological Survey (McDonald and Harbaugh 1988). Visual MODFLOW Version 4.1.0.145 was developed by Waterloo Hydrogeologic Inc. in recent years and is a pre-processor for quick generation of data files for MODFLOW.

Visual MODFLOW was used as a tool for generating MODFLOW model grids, boundary conditions, observation well data, production wells and zones for aquifer hydraulic parameters. The software was also used for establishing settings to run the model, and to obtain quick and convenient output results. The PCG2 solver was used for all steady state and transient modelling runs.

3.2 MODEL DOMAIN AND GRID

The model domain simulates an area 75 km (east-west) by 78.3 km (north-south). The bounding MGA coordinates of the model domain are (southwest) E425122 N6160180 and (northeast) E500122 N6238500 (GDA 1994) (Fig. 8).

The selection of a large model domain that incorporates the smaller study area is consistent with good modelling practice. The model domain boundaries are set at a sufficient distance from the study area such that they do not influence the behaviour of the aquifer system in the study area.

The rectangular model grid was divided into 434 columns and 472 rows. The minimum grid size is 125 x 125 m in the Pike and Murtho area. The maximum grid size is 250 x 250 m in the remaining model area (Fig. 9).

3.3 MODEL LAYERS IN PIKE – MURTHO AREAS

After the model transfer back from REM-Aquaterra (2005b), no changes were made to any of the model layers and structure contours.

MODFLOW layer options are given in Table 2.

Simplifying model geometry by reducing the number of model layers can reduce the huge input data set, help to avoid complications, reduce numerical errors, and speed up the model calculation process. According to McDonald and Harbaugh (1988), aquitards can be simulated as actual layers between aquifers when calculating vertical leakage, or simulated as vertical leakage between aquifers without an actual layer in the model (provided storage in the aquitards is not important). Without an aquitard layer, the vertical leakage will be calculated using the vertical hydraulic conductivity values, and thickness of the overlying and underlying layers. The method of using vertical leakage to simulate aquitards can be used where the aquitard layers are relatively thin and uniformly distributed.

Table 2. MODFLOW layer types

Layer type	Aquifer type	Aquifer hydraulic parameters
Type-0	Confined	Transmissivity and storage coefficient (specific storage, SS) are constant.
Type-1	Unconfined	Transmissivity varies and is calculated from saturated thickness and hydraulic conductivity. The storage coefficient (specific yield, SY) is constant. Type-1 is only valid for the uppermost layer of a model.
Type-2	Confined/ Unconfined	Transmissivity is constant - the storage coefficient may alternate between values applicable to the confined (SS) or unconfined (SY) states.
Type-3	Confined/ unconfined	Transmissivity varies and is calculated from the saturated thickness and hydraulic conductivity. The storage coefficient may alternate between values applicable to the confined (SS) or unconfined (SY) state.

In the model area, the Winnambool Formation aquitard is only ~3 m thick, and the Finnis Formation aquitard is uniformly less than 5 m in thickness. These aquitards can be merged into the underlying aquifers, and vertical hydraulic conductivity values in the aquifer layers can be used to calculate the vertical leakage between the aquifers.

According to modelled and observed data reported in Yan et al. (2005), the head difference between the Upper Mannum Formation and Lower Mannum Formation is very small in the project area. As there are three aquifers (Glenforslan Formation, Pata Formation and Monoman Formation) in the vertical profile between the Mannum Formation and the River Murray, upward leakage from the Mannum Formation will be very similar if the upper and lower components are merged into one layer in the model.

In terms of discussion above, the regional aquifer system in the Pike – Murtho area was conceptualised as a five layer model, including four aquifer layers and one aquitard layer (Fig. 10, Table 3). The model grid was applied to the five layers resulting in 1 024 240 finite difference cells.

Table 3. Model layer aquifers and aquitards

Layer No	Hydrogeological unit	Aquifer / aquitard	MODFLOW layer
1	Loxton Sands, Monoman Formation, part Pata Formation	Aquifer	Type-1
2	Lower Loxton Clay and Shells, Bookpurnong Formation, Pata Formation	Aquitard	Type-3
3	Pata Formation	Aquifer	Type-3
	Winnambool Formation	Aquitard	Simulated as leakage
4	Glenforslan Formation	Aquifer	Type-0
	Finnis Formation	Aquitard	Simulated as leakage
5	Mannum Formation	Aquifer	Type-0

3.3.1 GROUND SURFACE (IN PIKE-MURTHO)

The Department of Environment and Heritage (DEH) provided regional elevation data. Ground surface elevation is given in Figure 11. The elevation of the floodplain is ~8 m AHD. The elevation of the highland is ~30-80 m AHD.

3.3.2 LAYER 1 (IN PIKE-MURTHO): LOXTON SANDS, MONOMAN FORMATION

Layer 1 simulates the Loxton Sands unconfined - semi-unconfined aquifer and the Monoman Formation semi-unconfined – semi-confined aquifer:

1. In the highland area the unconfined aquifer is represented by the Loxton Sands. The base of layer 1 is the base of the Loxton Sands.
2. The Blanchetown Clay has not been modelled as the effect of this aquitard in perching water is accounted for by controlling the time lag and recharge rate to the Loxton Sands groundwater table.
3. The Monoman Formation represents the bulk of the unconfined aquifer in the River Murray valley. In reality, the Monoman Formation occurs in the unconfined – semi-confined state depending on the thickness and competence of the overlying Coonambidgal Formation. The representation of the Monoman Formation in the model as an unconfined aquifer results in the maximum flux of saline groundwater entering the river, and the most conservative wellfield design in terms of production well spacing and pumping rates. Regardless of the actual state of confinement of the Monoman Formation, when production wells are pumped, the aquifer becomes unconfined to some radial distance from the production well. The base of layer 1 (top of layer 2) is the base of the Monoman Formation.
4. Downstream of Loxton, where there is no floodplain, the Pata Formation comes into hydraulic communication with the River Murray and forms the unconfined aquifer.
5. Base elevations were determined from geological and geophysical logs and extrapolation of these values. The elevation of the base of layer 1 (top of layer 2) occurs from between -30–45 m AHD (Fig. 12).
6. The representation of layer 1 as a Modflow Type-1 layer (unconfined) results in conservative behaviour when conceptual wellfields are applied in the model.

3.3.3 LAYER 2 (IN PIKE-MURTHO): LOWER LOXTON CLAY AND SHELLS, BOOKPURNONG FORMATION

Layer 2 simulates the Lower Loxton Clay and Shells and Bookpurnong Formation aquitard:

1. In the highland area layer 2 represents the Lower Loxton Clay and Shells and Bookpurnong Formation. The base of layer 2 is the base of the Bookpurnong Formation.
2. In the River Murray valley, layer 2 represents the Bookpurnong Formation. The base
3. Base elevations were interpreted from geological and geophysical logs and the extrapolation of these values. Layer 2 has a thickness of 5–30 m. The base elevation of layer 2 (top of layer 3) occurs between -55–40 m AHD (Fig. 13).

3.3.4 LAYER 3 (IN PIKE-MURTHO): PATA FORMATION

Layer 3 simulates the regionally distributed Pata Formation semi-confined low permeability aquifer. The base elevation of layer 3 was interpreted from geological and geophysical logs

and extrapolation of these values, and by examination of the cross-sections (example given in Fig. 3) by REM-Aquaterra (2005a). Layer 3 has a thickness of 2–10 m. The base elevation of layer 3 (top of layer 4) occurs between -65–35 m AHD (Fig. 14).

3.3.5 WINNAMBOOL FORMATION

The Winnambool Formation vertical hydraulic conductivity was applied to the Pata Formation (layer 3) and the upper part of the Glenforslan Formation (layer 4) to allow calculation of the leakage between these aquifers. This modelling method simulates the effect of the Winnambool Formation.

3.3.6 LAYER 4 (IN PIKE-MURTHO): GLENFORSLAN FORMATION

Layer 4 simulates the regionally distributed Glenforslan Formation semi-confined, low permeability aquifer. Layer 4 thickness of 25 m was taken from AWE (2003). The base elevation of layer 4 (top of layer 5) occurs between –95–10 m AHD (Fig. 15).

3.3.7 FINNIS FORMATION

The Finnis Formation vertical hydraulic conductivity was applied to the lower part of the Glenforslan Formation (layer 4), and is used with the actual vertical hydraulic conductivity of the Mannum Formation (layer 5), to allow calculation of the leakage between these aquifers. This modelling method simulates the effect of the Finnis Formation.

3.3.8 LAYER 5 (IN PIKE-MURTHO): MANNUM FORMATION

Layer 5 simulates the regionally distributed Mannum Formation (semi)-confined moderate permeability aquifer. Layer 5 has a thickness of 80 m, taken from AWE (2003). The base elevation of layer 5 occurs between -195– -65 m AHD (Fig. 16).

3.4 MODEL HYDRAULIC PARAMETERS (IN PIKE-MURTHO)

In order to improve the model calibration, regional values of aquifer and aquitard hydraulic parameters were derived from previous reports, and referenced to current pumping tests.

Some aquifer hydraulic parameters were altered in specific areas during both steady state and transient calibration to achieve the final values required for accurate calibration. The final aquifer and aquitard hydraulic parameters are given in Table 4, with their distribution within each layer given in Figures 17–22.

New investigation data and further calibration have resulted in minor changes being made to hydraulic parameter values and zones since the model was returned from Aquaterra.

Table 4. Calibrated aquifer and aquitard hydraulic parameters in the project area (Pike-Murtho)

Aquifer / aquitard	Layer	Hydraulic conductivity		Storage	
		Kh (m/day)	**Kv** (m/day)	**Sy** (-)	**Ss** (/m)
Loxton Sands	1	0.5–7	0.005 – 0.05	0.1 – 0.15	
Monoman Formation	1	15	0.15	0.15	
Bookpurnong Formation	2	0.006	$1x10^{-5}$ – $2x10^{-3}$		$1x10^{-4}$
Pata Formation	3	0.5	$1x10^{-5}$ – $2x10^{-4}$		$1x10^{-4}$
Winnambool Formation	–		*		
Glenforslan Formation	4	1.5	$5x10^{-4}$		$1x10^{-4}$
Finnis Formation	–		*		
Mannum Formation	5	0.5–2	$5x10^{-6}$ – $1x10^{-3}$		$5x10^{-5}$

* Vertical leakance calculated by the model for each cell

3.4.1 AQUIFER HYDRAULIC PARAMETERS

Aquifer hydraulic parameters in the Pike and Murtho area, as refined by further calibration, include:

1. A horizontal hydraulic conductivity of 15 m/day, and a specific yield of 0.15 for the Monoman Formation. Horizontal hydraulic conductivity values remain very close to (and within the same order of magnitude) as values determined from pumping tests (20–40 m/day). Due to the representation of the Monoman Formation in the model as an unconfined aquifer, storage coefficient values determined from pumping tests are not applicable.
2. Horizontal hydraulic conductivities of 0.5–7 m/day, and a specific yield of 0.15 for the Loxton Sands. These parameter values are similar to those determined from pumping tests reported by REM-Aquaterra (2005a) (horizontal hydraulic conductivity 0.3–4 m/day, specific yield 0.02–0.13).

In addition:

3. Pata Formation aquifer hydraulic parameters were obtained from reference to current pumping tests (horizontal hydraulic conductivity 0.05–0.7 m/day, specific storage 0.001/m) (REM-Aquaterra 2005a) and adopted from REM-Aquaterra (2005b), and are generally consistent with the results of pumping tests.
4. Glenforslan Formation and Upper and Lower Mannum Formation aquifer hydraulic parameters were adopted from REM-Aquaterra (2005a), and are generally consistent with the results of pumping tests.

3.4.2 AQUITARD HYDRAULIC PARAMETERS

Aquitard hydraulic parameters were applied to control the upward and downward leakage between the Loxton Sands, Monoman Formation, and the Pata Formation:

Due to the relative scarcity of data in the project area, layer parameters were adopted from pumping tests done in the project area and nearby areas.

1. Bookpurnong Formation vertical hydraulic conductivity was obtained from reference to some pumping tests (vertical hydraulic conductivity range 1x10-3 – 5x10-3 m/day) in the Loxton area.
2. Winnambool Formation vertical hydraulic conductivity was obtained from reference to the pumping tests (vertical hydraulic conductivity range 1x10-5 – 1x10-3 m/day) in the Loxton area.
3. Finnis Formation parameters were adopted from Yan et al. (2005). The pumping tests were undertaken in the Loxton area and results indicate the model values are conservative (vertical hydraulic conductivity range 1x10-5 – 1x10-4 m/day).

3.5 MODEL BOUNDARIES

The five-layer model is complex, and different boundary conditions were applied to simulate the aquifer system, River Murray, and their hydraulic communication.

3.5.1 LAYER 1: LOXTON SANDS AND MONOMAN FORMATION

The regional groundwater flow is generally from model edge to the River Murray within the model domain with groundwater flux entering the River Murray. Where the aquifers are laterally adjacent, groundwater flows from the Loxton Sands into the Monoman Formation, and then discharges to the river. The following boundary conditions were applied to layer 1 (Fig. 23):

1. No-flow boundaries where groundwater flow is parallel to the model edge.
2. General head boundaries to simulate groundwater flow on the model edges where flow occurs into and out of the model.
3. Constant head boundary cells to simulate the River Murray (river stage AHD) in the project area:
   a. 19.2 m upstream Lock-6
   b. 16.3 m Lock-5 to Lock-6
   c. 13.2 m Lock-5 to Lock-4
   d. 9.8 m Lock-4 to Lock-3.

   Note: River head difference between upstream/downstream of lock-6 is simulated in the current model but it was not simulated in the Aquaterra model.
4. In the project area, model river cells to simulate anabranch creeks.

   Note: River cells were used to simulate creek systems on the Woolenook floodplain. These creek systems were not considered in the Aquaterra model. From local information and observations by DWLBC, the creek system flows into and out of the River Murray constantly (P Hasslett 2005, pers. comm. December). Higher salinity values in the creek also indicate saline groundwater water flux from the high land into the creek system is occurring.
5. In the project area, model drainage cells to simulate groundwater seepage from the highland to the floodplain.

Note: Subsequent drainages cells were inserted into the model (after Aquaterra version) in the Lyrup and North Murtho areas to simulate the seepages. The head level in the drainage cells were set at 13.8 m AHD and 18 m AHD respectively.

6. Drainage cells to simulate evaporation of discharge at low land areas near Mid Pike and at Noora.

3.5.2 LAYER 2: LOWER LOXTON CLAY AND SHELLS AND BOOKPURNONG FORMATION

Very small volumes of water move laterally into and out of this layer due to its low permeability. The following boundary conditions were applied to layer 2 (Fig. 24).

1. No-flow boundaries were used at the model edges.
2. Some constant head boundaries were used in the western area (different project area) of the model where the River Murray is assumed to be in hydraulic communication with the Pata Formation.

3.5.3 LAYER 3: PATA FORMATION

Regional groundwater flow is from the model edge to the River Murray within the model domain. The following boundary conditions were applied to layer 3 (Fig. 25).

1. No-flow boundaries where groundwater flow is parallel to the model edge.
2. General head boundaries were used at the model edges to simulate groundwater flow into and out of the model.
3. Constant head boundaries were used in the western area of the model (different project area) where the River Murray is assumed to be in hydraulic communication with the Pata Formation.
4. Constant head boundary cells to simulate the River Murray (river stage AHD):
   a. 9.8 m upstream Lock-3
   b. 6.1 m downstream Lock-3

3.5.4 LAYER 4: GLENFORSLAN FORMATION

The groundwater flow is from the model edge to the River Murray within the model domain. The following boundary conditions were applied to layer 4 (Fig. 26).

1. No-flow boundaries where groundwater flow is parallel to the model edge.
2. General head boundaries were used at the model edges to simulate groundwater flow into and out of the model.
3. Constant head boundaries were used in the western area of the model (different project area) where the River Murray is assumed to be in hydraulic communication with the Glenforslan Formation.

4. Constant head boundary cells to simulate the River Murray (river stage AHD):
   a. 9.8 m upstream Lock-3
   b. 6.1 m downstream Lock-3

3.5.5 LAYER 5: MANNUM FORMATION

Regional groundwater flow is from the model edge to the River Murray within the model domain. The following boundary conditions were applied to layer 5 (Fig. 27).

1. No-flow boundaries where groundwater flow is parallel to the model edge.
2. General head boundaries were used at the model edges to simulate groundwater flow into and out of the model.
3. Constant head boundaries (6.1 m AHD) were used in the western area of the model (different project area) where the River Murray is assumed to be in hydraulic communication with the Mannum Formation.

3.6 MODEL RECHARGE

The Pike – Murtho area has a semi-arid climate with hot dry summers and some rainfall during winter months. The average rainfall is ~400 mm/year with pan evaporation of ~2000 mm/year.

Prior to clearance of the native vegetation on the highland, vertical recharge to the water table aquifer resulting from rainfall infiltration is believed to have been as low as 0.07–0.1 mm/year (Allison et al. 1990). A recharge rate of 0.1 mm/year was applied in the steady state model, and to the non-cleared and non-irrigation areas in the transient model.

3.6.1 RECHARGE DUE TO MALLEE CLEARANCE

In 2005 Aquaterra stated “the widespread clearance of native vegetation in the dryland region of the project area has resulted in an increased rate of rainfall drainage past the root zone to the water table aquifer.”

In the model domain, recharge zones (41 zones) and rates (from 0.1 up to 11 mm/year) for Mallee clearance areas have been supplied by Department of Environment and Heritage. The zones and rates (Fig. 28, App. A–1) were based on recent studies by CSIRO (Cook et al. 2004) and DEH using SIMRAT and SIMPACT models. Time lags and recharge rates to the water table aquifer were estimated using information on soil type, depth to groundwater and thickness of Blanchetown Clay. Time of the mallee clearance was assumed to have started in 1920.

3.6.2 INITIAL RECHARGE DUE TO IRRIGATION

The recharge zones and recharge rates due to irrigation drainage to the Loxton Sands aquifer in the Pike – Murtho area were initially adopted from REM-Aquaterra (2005b). Aquaterra provided the following information regarding this issue:

"Recharge is a very complex feature of the model, because it needs to account for a time lagged flux to the water table, calculated from surface irrigation and rainfall over the last 100 years, based on measurements (and some estimates) of river diversion volumes, irrigation areas and irrigation efficiencies.

The irrigation area recharge model is based on:

- *GIS information of irrigation scheme growth in area terms at generally decadal intervals since 1920.*
- *Available monitoring information of total irrigation scheme diversions (from Smith (1997), and REM, (2002a)).*
- *Assumptions regarding irrigation water use efficiency and root zone drainage; (assume 15% root zone drainage for all time periods).*
- *SIMRAT model time lags for irrigation root zone drainage to reach the water table.*
- *Information on drainage well fluxes."*

Aquaterra estimated the total volume of water applied at the surface based on the information above for each irrigation area. The assumption of 15% root zone drainage to define the recharge rates was used for most areas in the historical model simulation.
After Aquaterra completed modelling, DWLBC have made the following changes:

1. *Model recharge zones:* Model recharge zones were simplified from 175 recharge zones (supplied by Aquaterra) to 62 zones based on similar recharge onset times and rates. Recharge zones in the irrigation areas can be seen in Figures 29–33, whilst irrigation start times and lag times for each zone are included in Appendix A.
2. *Drainage wells:* Drainage wells in the Murtho area were carefully considered. In most cases the wells were drilled as a solution to water logging problems caused by a perched water table. Drainage wells act to short circuit the estimated time lags between an irrigation event and recharge at the water table.
3. *Recharge rates:* To define initial recharge rates to be subject to calibration, Aquaterra's estimates of total volume applied for each area were revised by applying a time varying percentage of the total volumes spread over the active irrigation area. This approach accounts for changes to irrigation efficiency.

3.6.3 RECHARGE IN THE MURTHO AREA

3.6.3.1 Recharge in the North Murtho area

Time lag (5–35 year): Data from DEH suggests irrigation commenced in 1960 and recharge to the groundwater system was first applied to the model in 1985. The lag time predicted by DEH (SIMRAT) is assumed to be highly variable in this area because irrigation occurs on the highland and also on sloping areas between the highland and floodplain.

Actual model recharge (from 1985–2005): Since very little calibration data exists in the North Murtho irrigation area, recharge rates are based on the information from REM-Aquaterra (2005b). Initial recharge rates are around 450 mm/year and then decrease as irrigation efficiency improves. The timing of groundwater recharge is based on DEH data for irrigation start time and estimation of lag time. The assumed rates match well to the small amount of data that is available in this area.

3.6.3.2 Recharge in the Central Murtho area

Time lag (10–70 year): Irrigation commenced around 1950 in the Central Murtho irrigation area and irrigation drainage recharge to the groundwater system is first applied in the model in 1960 (10 years after irrigation). Most irrigation in the Central Murtho area is located on the highland and only a small percentage occurs on slope areas.

Actual model recharge (before 1990s): Early recharge in the Central Murtho area was dominated by irrigation on the slope area due to relatively short lag times. The initial recharge rates are as high as 500 mm/y but quickly reduce to around 300 mm/y, possibly due to a shift away from flood irrigation practices. Total recharge volume increases steadily until the 1990s (App. A–3) because additional irrigation zones become active, offsetting 'Improved Irrigation Practices' (IIP) and decreases in groundwater recharge rates.

Actual model recharge (from 1990s–2005): Modelled recharge rates since the 1990s (in the model) have remained around or slightly below 300 mm/y in order to improve calibration. This high recharge may be caused by flood irrigation in the 1960s or earlier.

Drainage wells: Data from SAGeodata database indicated drainage wells existed in the Central Murtho area from 1975. To achieve calibration, some of these drainage wells were included in the model at rates of 1–1.5 litres/second for each well. The assumption that all wells were sealed and disused by 2002 (P Hasslett 2006, pers. comm. January) matches well with observed data.

3.6.3.3 Recharge in the South Murtho area

Lag time (30–40 year): Irrigation commenced around 1940 in the South Murtho area and irrigation drainage recharge to the groundwater system is first applied in the model in 1970. Irrigation only occurs on the highland in the South Murtho area.

Actual model recharge (from 1970–2005): Groundwater recharge occurs in only two zones close to the river during the calibration period (1970–2005). Observed hydrographs indicated initial recharge rates of 200 mm/year that drop to around 100mm/year in 2000. This observed decrease is most likely due to increased irrigation efficiency.

Drainage Wells: Data from SAGeodata database indicated drainage wells existed in the South Murtho area from 1970. To achieve calibration, some of these drainage wells were included in the model at rates of 0.5–1 litre/second for each well. The assumption was made that all wells were sealed and disused by 2002 (P Hasslett 2006, pers. comm. January). Model simulation results matched well with observed data.

3.6.4 RECHARGE IN THE PIKE AREA

3.6.4.1 Recharge in the Upper Pike area

Time lag (15–45 year): DEH data suggests irrigation commenced in 1950 in the Upper Pike irrigation area and irrigation drainage recharge to the groundwater system is first applied to the model in 1975. All irrigation areas are located on the highland, supporting reasonably long (SIMRAT) predicted time lags.

Actual model recharge (from 1975–2005): Since no useful groundwater level data exists in the Upper Pike irrigation area, recharge rates are based on the information from REM-Aquaterra (2005b).

3.6.4.2 Recharge in the Mid Pike area

Lag time (10–30 year): Irrigation commenced in the Mid Pike area in 1940 and irrigation drainage recharge to the groundwater system is first applied to the model in 1955. All irrigation areas are located on the highland, supporting reasonably long (SIMRAT) predicted time lags.

Actual model recharge (before the 1990s): Prior to the 1990s, recharge rates of between 150–250 mm/year resulted in a satisfactory calibration with hydrographs.

Actual model recharge (between the 1990s–2005): The (calibrated) steadily decreasing recharge rates most likely reflect historic improvements in irrigation practice. Several recharge zones further from the Pike River become active later in this model period which result in an increase in total recharge volume (App. A–6).

3.6.4.3 Recharge in the Simarloo area

Lag time (0–35 year): Most irrigation in the Simarloo area occurs on the highland (lag times of 10–35 years), however, some irrigation areas are on the floodplain (zero lag time). Irrigation commenced in 1940 and recharge is applied in the model from 1960.

Actual model recharge (prior to the 1990s): Recharge occurs only on the highland before 1990 and rates are high, around 400–500 mm/y. Calibration indicates a small decline in recharge rates during this model period.

Actual model recharge (between the 1990s–2005): Calibration indicates that recharge rates in all zones decrease during this model period, most likely a response to irrigation efficiency improvements.

Calibration with hydrographs in the Simarloo irrigation area indicates that a majority of the irrigation drainage flux occurs close to the river (zone 51), none in the central irrigation area (zone 53) and less than expected on the south side of the irrigation area (zone 54). The recharge situation at Simarloo has not been comprehensively explained and the unusual conditions may be attributed to abnormalities in the upper surface of the Blanchetown Clay.

3.6.4.4 Recharge in the Lyrup area

Lag time (5–20 year): DEH data suggests irrigation started in Lyrup before 1885, however, major irrigation development began in 1920 (REM-Aquaterra 2005b). Relatively short time lags (generally 5 years) were applied in the Lyrup area because irrigation primarily occurred on the floodplain and highland slopes, where depths to the water table are shallow. The recharge zones in the highland areas were assumed to have lag times of 10–20 years.

Actual model recharge (prior to the 1990s): Modelled recharge rates are initially high (400–500 mm/year) probably due to inefficient irrigation practices such as flood irrigation. Recharge rates decreased to 200 mm/y by 1980 (to achieve calibration), probably due to some considerable improvements in irrigation practices.

Actual model recharge (between 1990s–2005): Calibration results indicate a decline in recharge rates to 150 mm/year in the Lyrup area in 2000, probably a response to IIP.

3.6.5 RECHARGE APPLIED FOR PREDICTIVE MODELLING

Based on the calibrated model, five future scenarios were developed to predict salt loads to the River Murray as a result of various accountable irrigation actions. Details of the recharge zones and rates in the scenarios are included later in this report (Model Scenarios and Predictions).

A recharge rate of 100mm/year was assumed for all future irrigation areas. This value was predicted by DEH (SIMPACT) and agreed upon by DWLBC and MDBC.

3.7 MODEL EVAPOTRANSPIRATION

Evapotranspiration was simulated using the ground surface as a control point. Evapotranspiration rates of 200–250 mm/year and 1.5 m extinction depth were used in the model (Holland et al., 2001). Evapotranspiration is most likely to occur on the larger floodplains and in some low land areas close to the Mid Pike irrigation area where a shallow groundwater table exists.

3.8 MODEL GROUNDWATER ALLOCATION AND USE

There is no allocation of groundwater or known groundwater use in the Pike – Murtho area.

3.9 MODEL STRESS PERIOD

The transient model was used to simulate the historical period (1885–2005) using five year stress periods. For predictions (1988–2105), two-year stress periods were used.

In the final reporting, the results of predicted annual salt loads entering the River Murray have only been presented after 1950, as before this time, no major hydraulic changes occurred with the exception of the Lyrup area. Although irrigation commenced in Lyrup from 1885, the salt load impact was relatively small during this period.

4. MODEL CALIBRATION

4.1 STEADY STATE MODELS, TRANSIENT MODELS AND CALIBRATION

Steady state models are used to model equilibrium hydrologic conditions and/or conditions when changes in storage are insignificant. Transient models are used to model time dependent stresses and/or where water is released from, or taken into storage.

Calibration of the model with existing data must be conducted in order to have confidence in predictive modelling. Calibration is necessary to demonstrate that the model can replicate the behaviour of the aquifer system for at least one set of conditions. A sensitivity analysis must also be undertaken to determine the relative importance of model parameters (i.e. the system drivers) in achieving calibration.

4.2 STEADY STATE MODEL CALIBRATION

Steady state calibration is undertaken to develop a broad-scale hydraulic conductivity distribution by matching modelled to observed potentiometric heads. Steady state calibration was performed by adjusting hydraulic conductivities (within reasonable limits) and model boundary conditions. Dynamic stresses and storage effects are excluded from steady state calibration.

Due to the absence of pre-irrigation development potentiometric head data, the steady state model was calibrated using a constructed (S. Barnett, DWLBC) pre-irrigation development and pre river regulation potentiometric surface (Fig. 34), that is believed to represent equilibrium hydraulic conditions in the area (note that this is the only available data).

A modelled potentiometric surface was achieved that closely matches the constructed (groundwater table) potentiometric surface (Fig. 34) in the Loxton Sands and Monoman Formation (in the east of the model domain), and the Murray Group Limestone (in the west of the model domain where it is unconfined), at a time post-regulation of the River Murray, but prior to irrigation development and enhanced recharge to the Loxton Sands.

The model is considered to closely match the constructed surface on a regional scale. In the project area surrounding Lock 5, the calibration does not fit closely due to different conditions between the potentiometric surface (Pre regulation) and model results (Post regulation).

4.3 TRANSIENT MODEL CALIBRATION

Transient calibration is undertaken on an iterative basis by adjusting hydraulic parameters, recharge rates and boundary conditions until a satisfactory match with observed data is obtained. The potentiometric surface output from the steady state model was used as the starting point for transient model runs up to 2005. Each time a change to the boundary conditions and aquifer hydraulic parameters was made in the transient model, the steady state model was altered and rerun, with the output being used as the starting point for the transient model.

Model calibration was achieved by the following actions, in accordance with the Groundwater Flow Modelling Guideline, (MDBC 2001):

1. Qualitative comparison between modelled and observed potentiometric heads (contours).
2. Quantitative comparison between modelled and observed potentiometric heads (hydrographs).
3. Iteration residual error.
4. Confirmation using 'Run of River' salt load into the River Murray (rather than water balance as calibration, as recommended).

In the Pike – Murtho project area, salt loads in to the River Murray are mainly from lateral groundwater flux through the Loxton Sands aquifer that is either directly in contact with the river or anabranches (cliff face) or the river valley (floodplain and then the river). Therefore, the observed data (water level contours and hydrographs) in the Loxton Sands (layer 1) were mainly used to compare the modelled head levels and trends in the calibration process. The head level in the Murray Group Limestone aquifer (Mannum Formation, layer 5) has also been considered in the calibration exercise because of the potential for upward leakage from the underlying aquifers driven by these heads. No calibrations were undertaken in the Pata Formation (layer 3) or Glenforslan Formation (layer 4) due to insufficient data for these layers.

4.3.1 QUALITATIVE COMPARISON OF POTENTIOMETRIC HEADS (CONTOURS)

Initial qualitative calibration of the transient model was undertaken by simulating the 2005 regional potentiometric heads. The modelled and observed potentiometric heads from 2005 were compared to determine the accuracy of the calibration.

4.3.1.1 Layer 1: Loxton Sands and Monoman Formation

Qualitative comparison between the modelled (Fig. 35) and observed potentiometric head contours of the Loxton Sands and Monoman Formation in the Pike – Murtho area indicates that the modelled distribution closely represents the shape and form of the observed distribution.

Model results suggest that small groundwater mounds may be developing in the Simarloo and Central Murtho areas that are not evident in the observed surface that was plotted using 'Surfer' contour software. This difference can possibly be attributed to a lack of control points (observed head level data) in the contouring process in these areas.

There is some discrepancy between the modelled and observed surface in the low land areas between Noora basin and the Mid Pike irrigation area. This discrepancy may also be due to a lack of observed data points and also one questionable data point. This area is sufficiently far enough from the Pike River and on the other side of the irrigation mound such that the discrepancy is considered not to significantly affect the modelled salt load results.

4.3.1.2 Layer 5: Mannum Formation

Qualitative comparison between the modelled (Fig. 36) and observed potentiometric heads of the Murray Group Limestone (assume was from Mannum Formation) indicates that the modelled distribution closely represents the regional gradient of the observed distribution.

Calibration of potentiometric heads in the Pata Formation (layer 3) and Glenforslan Formation (layer 4) was not undertaken due to the lack of observation data. Modelling has indicated that vertical flux to the river is minimal (reported in Section 6), therefore it is not included in the results presented in this report and the lack of calibration data for these layers is considered acceptable.

4.3.2 QUANTITATIVE COMPARISON OF POTENTIOMETRIC HEADS (HYDROGRAPHS)

Quantitative calibration focused on the Loxton Sands aquifer (layer 1), as it is the major aquifer that contributes salt load into the River Murray and will be one of the main target aquifers for Salt Interception Schemes.

There are several historical water level hydrographs for the Murray Group Limestone and these have been included in calibration in areas where there is limited data for layer 1.

Quantitative comparison between modelled and observed (historical) potentiometric heads (locations shown in Fig. 37) indicates a close match in most wells (Figs 38–46).

4.3.3 ITERATION RESIDUAL ERROR

The iteration residual error between modelled and observed potentiometric heads of the Loxton Sands, Monoman Formation and Murray Group Limestone aquifers in the Pike – Murtho area was calculated using data from 1980, 1995, 2002 and 2005 (years for which more data was available). The calculations (Figs 47–50) indicate a normalised root mean square value for 1980 (3.1%), 1995 (3.0%), 2002 (2.5%) and 2005 (2.2%) for the whole project area. These values are less than the 5% recommended by the Groundwater Flow Modelling Guideline (MDBC 2001) and indicate a very good fit between modelled and observation data over the time period considered in the analyses.

4.3.4 COMPARISON OF RECHARGE VOLUMES

REM-Aquaterra (2005b) calculated accession rates of irrigation drainage water (recharge) using irrigation area, irrigation application volume (based on crop type and water diversion records), average rainfall and estimated 15% root zone drainage. The lag times for irrigation drainage to reach the water-table were calculated by DEH based on depth to water-table, soil type and thickness of Blanchetown Clay. These recharge zones, recharge rates and lag times were used as initial values for the DWLBC model and then modified during the calibration process to achieve the best match with observed potentiometric heads in the water-table aquifer. The total volume of recharge applied in the calibrated model was then compared with the Aquaterra calculated accession volumes (Fig. 51).

In the Murtho area, recharge is lagged by a substantial 10–70 years and model recharge volume matches very well to the calculated accession volume (Fig. 51) once this lag is accounted for. Figure 51 also shows that drainage wells deliver a significant volume to the water-table shortly after a steep increase in irrigation volume, showing the short circuit effect of the drainage wells for some percentage of recharge. The recharge scenario shown beyond 2005 (Fig. 51) is 'current irrigation' Scenario–4 (see Section 5) and represents our best interpretation of the future recharge condition due to irrigation that has already occurred by 2005.

In the Pike area, calibrated recharge matches quite well to the calculated accession (Fig. 51) despite the time lag of up to 45 years.

The differences between calculated accession and the calibrated recharge represent the changes made to the recharge model during calibration. Confidence in the initial data subjected to calibration is reasonable but not beyond question. The similarity in the values helps to provide additional confidence that the total recharge applied in the model is a reasonable estimate.

4.4 TRANSIENT MODEL CONFIRMATION

The salt load entering the River Murray in the Pike – Murtho area was calculated using the modelled groundwater flux and groundwater salinity in each budget zone. The salinity for each zone and the resulting calculations of the salt load are given in Appendix B.

4.4.1 COMPARISON BETWEEN MODEL RESULTS AND RUN OF RIVER SALTLOAD

In the Pike - Murtho area, the modelled (calculated) salt load entering the River Murray was compared with the salt load estimates from 'Run of River' surveys, which can be highly variable depending on river flows. The modelled salt load values in 2005 are acceptable when compared to the Run of River results from recent years (Table 5).

Table 5. Comparison between modelled salt load (2005) and Run of River salt load in the Pike – Murtho area

	Salt load (t/day)	
Area	**Run of River**	**Modelled Result (2005)**
Murtho	39–86	103
Pike	44–130	156

Note regarding Pike-Mundic Floodplain: The model result shows around ~30 t/day salt load (~1000 m^3/day flux and salinity of 30 000 mg/L) constantly enters the Pike River from the Pike-Mundic floodplain near Simarloo. This salt load is not included in the model prediction results in this report due to the following reasons:

- It does not come from the eastern side (ie the irrigation areas).
- It has occurred since river regulation and the salt load into the River Murray is relatively constant.

- This report is intended to mainly predict the salt loads into the River Murray due to Mallee clearance and irrigation activities on the eastern side of the River Murray and its anabranches.

Note regarding Salt Creek: It has been determined that the Salt Creek area does not deliver salt to the River Murray on a daily basis, hence salt loads for this area are not included in the total Pike salt load in this report. It was determined by information from the local management committee and analysis of aerial photography that surface water features in the Salt Creek area do not communicate directly with the River Murray during a 'normal' flow regime. We assume that any salt load entering the Salt Creek area is stored for some amount of time until it is released during a high flow or flood event.

4.4.2 COMPARISON BETWEEN MODEL RESULTS AND IN-RIVER NANOTEM

The modelling discussed in this report identifies sections of the River Murray where the salt load entering the river is greatest (Figs 52 and 53), which are relatively consistent with likely discharge zones indicated by the In-River NanoTEM data (Telfer et al. 2004) (Fig. 2).

Both techniques suggest:

- a relatively low salt load entering the river at South Murtho and Paringa,
- both identify a likely hotspot at North Murtho just south of Lock 6,
- a relatively high salt load in the mid and lower reaches of the Pike River.

5. MODEL SCENARIOS AND PREDICTIONS

Once satisfactory calibration of the model has been achieved, the transient model provides a useful predictive tool to quantify potential fluxes of saline groundwater, and the potential impacts of specific stresses on potentiometric heads, over periods that may range from tens to hundreds of years.

Note that all predictions for this project are salt loads from the eastern side of the River Murray and anabranches.

5.1 SCENARIOS

The modelling scenarios are summarised in Table 6, and are discussed in detail in the following section. These scenarios have been developed over time in response to requests by the State (DWLBC) and the MDBC to:

1. Evaluate the impact of various accountable actions, to be recorded on the MDBC salinity registers 'A' and 'B', including:
   a. Impact of the various pre and post-1988 actions on the groundwater flux and salt load entering the River Murray.
   b. Impact of improved irrigation practices, the rehabilitation of distribution system, and construction of SIS on the groundwater flux and salt load entering the River Murray.
2. Determine the State and Federal responsibility for cost sharing.
3. Satisfy the reporting requirements of:
   a. Schedule 'C' of the Murray-Darling Basin Agreement 1992.
   b. Basin Salinity Management Strategy Operational Protocols 2003.

The scenarios include the application (or not) of the following important conditions:

Pre-1988 irrigation	Irrigation development area and recharge that occurred prior to 01/01/1988
Post-1988 irrigation	Irrigation development area and recharge that occurred between 01/01/1988 and end of financial year 2005–06.
Future Development	Future irrigation development area and recharge (assuming recharge of 100 mm/yr) resulting from activation of already allocated water that is assumed to occur in 2015.
Mallee Clearance	Clearance of natural vegetation assumed commencing from 1920s, resulting in increased recharge to the groundwater table in dry-land areas. No major clearing of native vegetation occurred after 1988.
Improved Irrigation Practices (IIP)	Commencing in the mid 1990s when flood irrigation via earth channels was replaced by sprinkler and drip irrigation systems, thus increasing irrigation efficiency (70–85%) and reducing recharge to the groundwater table.

Rehabilitation (RH) Replacement of leaky concrete water distribution channels with pipelines (e.g. in the Loxton area RH commenced in 2002) resulting in reduced transportation losses which are reflected by reduced recharge to the groundwater table. Note: RH does not occur in the Pike Murtho area.

SIS Salt Interception Scheme designed to intercept the (maximum) groundwater flux and salt load resulting from the pre-1988, post-1988 and future development irrigation.

Table 6. Summary of modelled scenarios and conditions

Scenario	Name	Model Run	Irrigation development area	IIP	RH	SIS
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920–2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988–2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988–2105	Pre-1988	Yes	No	–
S–3C*	Pre-1988, with IIP and with RH	1988–2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005–2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005–2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005–2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

* Scenario-3C is not applicable since no rehabilitation has occurred in the Pike – Murtho area

5.2 SCENARIO-1: NATURAL SYSTEM

Steady State Scenario-1 models the base groundwater flux and salt load entering the River Murray post-river regulation but prior to irrigation development.

5.2.1 SCENARIO-1: CONDITIONS

The following conditions are applied to the steady state model:

1. Post-regulation of the River Murray.
2. Pre-irrigation development.

Time period = steady state

5.2.2 SCENARIO-1: MODELLING RESULTS

The results given in Table 7 indicate the modelled flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area.

Table 7. Modelled groundwater flux and salt load in the Pike – Murtho area (Scenario-1)

	Murtho Area	Pike Area
Flux (ML/day)	1.12	2.19
Saltload (t/day)	32.0	63.5

5.3 SCENARIO-2: MALLEE CLEARANCE

Transient Scenario-2 models the hydrological changes, groundwater flux and salt load entering the River Murray that would be expected to occur due to the clearance of the native mallee vegetation (by comparison with Scenario-1) and the subsequent increase in recharge rates.

5.3.1 SCENARIO-2: CONDITIONS

The following conditions are applied to the transient model:

1. Post-regulation of the River Murray.
2. No irrigation development.
3. Mallee clearance zones commencing in 1920.
4. Within the Mallee clearance zones, application of recharge rates >= 0.1 mm/year, increasing in some areas to ~11 mm/year after a period of 200 years, with changes (representing lag-times) occurring every 10 years (data provided by DEH).
5. Outside the Mallee clearance zones, application of a recharge rate of 0.1 mm/year Time period = 1920–2105.

5.3.2 SCENARIO-2: PREDICTION RESULTS

The results given in Tables 8a and 8b summarise the predicted flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 8a. Predicted groundwater flux and salt load in the Murtho area (Scenario-2)

Murtho Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	1.14	1.15	1.15	1.19	1.39
Saltload (t/day)	32.7	32.9	33.0	34.0	39.8

Table 8b. Predicted groundwater flux and salt load in the Pike area (Scenario-2)

Pike Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	2.28	2.33	2.36	2.64	3.11
Saltload (t/day)	65.8	67.0	67.8	75.1	88.1

5.4 SCENARIO-3A: PRE-1988, NO IIP, NO RH

Transient Scenario–3A predicts the hydrological changes, groundwater flux and salt load entering the River Murray that would be expected to occur between 1988–2105 assuming pre-1988 irrigation development with no mitigation.

5.4.1 SCENARIO-3A: CONDITIONS

The following conditions are applied to the transient model:

1. The potentiometric head distribution output from the historical model at 1 January 1988 used as the starting point for the prediction run until 2105.
2. Pre-1988 irrigation development area applied between 1988–2105.
3. Pre-1988 recharge rates and lag times (from the historical model) applied between 1988–2105. This assumes irrigation efficiency of 70%.

Time period = 1988–2105

5.4.2 SCENARIO-3A: PREDICTION RESULTS

The results given in Tables 9a and 9b summarise the predicted flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 9a. Predicted groundwater flux and salt load in the Murtho area (Scenario-3A)

Murtho Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	3.15	4.34	4.77	9.89	10.69
Saltload (t/day)	99.5	123.6	135.2	278.3	300.9

Table 9b. Predicted groundwater flux and salt load in the Pike area (Scenario-3A)

Pike Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	6.53	6.90	7.05	9.14	9.54
Saltload (t/day)	149.7	160.9	165.6	226.4	237.6

5.5 SCENARIO-3B: PRE-1988, WITH IIP, NO RH

Transient Scenario-3B predicts the hydrological changes, groundwater flux and salt load entering the River Murray that would be expected to occur between 1988–2105 assuming pre-1988 irrigation development with IIP. This scenario tests the reduction in salt load (by comparison with Scenario–3A) resulting from the implementation of IIP.

5.5.1 SCENARIO-3B: CONDITIONS

The following conditions are applied to the transient model:

1. The potentiometric head distribution output from the historical model at 1 January 1988 used as the starting point for the prediction run until 2105.
2. Pre-1988 irrigation development area applied between 1988–2105.
3. IIP - Recharge rates decreasing from the mid 1990s, in accordance with calibrated IIP, to 100 mm/year. This assumes an increase in irrigation efficiency to 85%.

Time period = 1988–2105

5.5.2 SCENARIO-3B: PREDICTION RESULTS

The results given in Tables 10a and 10b summarise the predicted flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 10a. Predicted groundwater flux and salt load in the Murtho area (Scenario-3B)

Murtho Area	Year				
	1988	**2000**	**2005**	**2050**	**2105**
Flux (ML/day)	3.51	4.34	3.62	4.98	4.91
Saltload (t/day)	99.5	123.5	103.0	140.4	138.2

Table 10b. Predicted groundwater flux and salt load in the Pike area (Scenario-3B)

Pike Area	Year				
	1988	**2000**	**2005**	**2050**	**2105**
Flux (ML/day)	6.53	6.88	6.22	5.84	5.96
Saltload (t/day)	149.7	160.3	149.8	152.6	156.1

5.6 SCENARIO-3C: PRE-1988, WITH IIP AND WITH RH

This scenario tests the reduction in salt load (by comparison with Scenario-3B) resulting from the implementation of RH. No rehabilitation has occurred in the Pike – Murtho area hence Scenario-3C results are identical to Scenario-3B.

5.7 SCENARIO-4: CURRENT IRRIGATION

Transient Scenario-4 predicts the hydrological changes, groundwater flux and salt load entering the River Murray that would be expected to occur between 2005–2105 assuming the current irrigation condition (pre-1988 plus post-1988 irrigation development with IIP and RH). This scenario predicts the likely future salt load if the current conditions remain unchanged in the future.

5.7.1 SCENARIO-4: CONDITIONS

The following conditions are applied to the transient model:

1. The potentiometric head distribution output from the historical model at 2005 used as the starting point for the prediction run until 2105.
2. Pre-1988 + post-1988 irrigation development area applied between 2005–2105.
3. IIP - recharge rates decreasing from the mid 1990s, in accordance with calibrated IIP, to 100 mm/year. This assumes an increase in irrigation efficiency to 85%.
4. RH.

Time period = Irrigation commencement to 2105

5.7.2 SCENARIO-4: PREDICTION RESULTS

The results given in Tables 11a and 11b summarise the predicted flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 11a. Predicted groundwater flux and salt load in the Murtho area (Scenario–4)

Murtho Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	3.51	4.34	3.62	6.20	8.34
Saltload (t/day)	99.5	123.5	103.0	174.0	234.7

Table 11b. Predicted groundwater flux and salt load in the Pike area (Scenario–4)

Pike Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	6.53	7.25	6.57	6.98	7.39
Saltload (t/day)	149.7	167.1	156.0	181.2	192.7

5.8 SCENARIO-5: CURRENT PLUS FUTURE IRRIGATION

Transient Scenario-5 predicts the hydrological changes, and the maximum groundwater flux and salt load entering the River Murray that would be expected to occur between 2005–2105 assuming the current irrigation (pre-1988 plus post-1988 irrigation development with IIP and RH) plus future irrigation development. This scenario tests the maximum increases in salt load (by comparison with Scenario-4) resulting from future irrigation development.

5.8.1 SCENARIO-5: CONDITIONS

The following conditions are applied to the transient model:

1. The potentiometric head distribution output from the historical model at 2005 used as the starting point for the prediction run until 2105.

2. Pre-1988 + post-1988 + future irrigation development area applied between 2005–2105.
3. IIP - recharge rates decreasing from the mid 1990s, in accordance with calibrated IIP, to 100 mm/year. This assumes an increase in irrigation efficiency to 85%.
4. RH.
5. Recharge from future irrigation development areas at a fixed rate of 100 mm/yr operating from 2015 (with DEH estimated lag time) to 2105, assuming 85% efficiency.

Time period = 2005–2105

5.8.2 SCENARIO-5: PREDICTION RESULTS

The results given in Tables 12a and 12b summarise the predicted maximum flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 12a. Predicted groundwater flux and salt load in the Murtho area (Scenario-5)

Murtho Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	3.51	4.34	3.62	6.20	13.83
Saltload (t/day)	99.5	123.5	103.0	174.0	389.0

Table 12b. Predicted groundwater flux and salt load in the Pike area (Scenario-5)

Pike Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	6.53	7.25	6.57	7.22	9.49
Saltload (t/day)	149.7	167.1	156.0	188.9	250.3

5.9 SCENARIO-6: SIS

Transient Scenario-6 predicts the hydrological changes, and the maximum groundwater flux and salt load entering the River Murray that would be expected to occur between 2005–2105 assuming the current irrigation development (i.e. pre-1988 plus post-1988 irrigation development with IIP and RH), plus future irrigation development, plus operation of a SIS. This scenario tests the decrease in salt load (by comparison with Scenario-5) resulting from the construction of a SIS.

5.9.1 SCENARIO-6: CONDITIONS

The following conditions are applied to the transient model:

1. The potentiometric head distribution output from historical model at 2005 used as the starting point for the prediction run until 2105.
2. Pre-1988 + post-1988 + future irrigation development area applied between 2005–2105.
3. IIP - recharge rates decreasing from the mid 1990s, in accordance with calibrated IIP, to 100 mm/year. This assumes an increase in irrigation efficiency to 85%.

4. RH.
5. Recharge from future irrigation development areas at a rate of 100 mm/yr operating from 2015 (but with DEH lag time) to 2105, assuming 85% efficiency.
6. Construction and operating of a SIS in 2005.

Time period = 2005–2105

5.9.2 SCENARIO-6: PREDICTION RESULTS

The results given in Tables 13a and 13b summarise the predicted flux and salt load entering the River Murray from the eastern side in the Pike – Murtho area. Complete results of the predicted flux of saline groundwater and salt load are given in Appendix B.

Table 13a. Predicted groundwater flux and salt load in the Murtho area (Scenario–6)

Murtho Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	3.51	4.34	3.62	1.05	2.71
Saltload (t/day)	99.5	123.5	103.0	29.6	76.0

Table 13b. Predicted groundwater flux and salt load in the Pike area (Scenario–6)

Pike Area	Year				
	1988	2000	2005	2050	2105
Flux (ML/day)	6.53	7.25	6.57	2.52	2.93
Saltload (t/day)	149.7	167.1	156.0	63.4	74.9

5.9.3 SCENARIO-6: SIS CONCEPT DESIGN

The conceptual curtain wellfield SIS layout (originally from REM-Aquaterra 2005b) has been refined using the groundwater model and an improved understanding of the conceptual hydrogeological model. Changes were made to the conceptual SIS design in the Central Murtho area where the REM-Aquaterra modelled scheme did not intercept the flux of saline groundwater to the Murtho creek system.

The revised concept SIS is composed of 22 floodplain and 42 highland production wells at Murtho (Fig. 54) and 15 floodplain and 40 highland production wells at Pike (Fig. 55), generally pumping at between 1–3 L/s. The concept SIS is a staged approach and production wells become active in 2005, 2020, 2035 and 2050. Full details of pumping rates are provided in Appendix B.

The SIS wells are modelled as drainage cells set at or just below river pool level. This method assumes the SIS infrastructure is capable of achieving target drawdown (regardless of local geological condition) and allows optimum pump rates for each well to be calculated. In practical terms, one drain cell in the model may require two or more SIS wells on the ground to achieve the drawdown required, however the calculated flux requiring interception stays the same.

The saline groundwater from the SIS will be disposed into the Noora Basin east of Loxton.

5.10 COMPARISON OF SALT LOADS ENTERING THE RIVER MURRAY FOR ALL SCENARIOS

The graphs of predicted salt loads entering the River Murray for all scenarios for Murtho and Pike (Figs 56 and 57 respectively) indicate the trends for each scenario.

Figure 56 shows that the current concept SIS may not fully intercept the groundwater flux in the longer term (50–100 years) due to future irrigation development in the Murtho area. If so, closer well spacings and/or greater abstraction rates will be required.

6. MODEL SENSITIVITY ANALYSIS

6.1 SENSITIVITY ANALYSIS

Sensitivity analysis is a procedure for quantifying the impact of an incremental variation in aquifer hydraulic parameters, or a stress, on an aquifers modelled response. The purpose of the sensitivity analysis is to identify the key drivers of the system.

The transient model has been calibrated for aquifer hydraulic parameters and recharge, and only requires sensitivity testing for issues of major concern and to comply with the Murray Darling Basin Modelling Guideline, MDBC (2001).

Scenario-5 was selected for all following sensitivity tests, as it is a worst-case scenario of existing irrigation area plus full future irrigation development in the Pike – Murtho area.

6.1.1 SENSITIVITY TEST-1: VARIATION OF LOXTON SANDS AQUIFER HYDRAULIC PARAMETERS INCREASING/ DECREASING BY 15%

This sensitivity test was conducted to test the impact of variations in the aquifer hydraulic parameters of the Loxton Sands (specific yield SY and horizontal conductivity Kh) on the magnitude of salt load from the Loxton Sands to the River Murray or to the Monoman Formation (floodplain) then to the river.

6.1.1.1 Sensitivity test-1: Conditions

Sensitivity testing was conducted by varying the Loxton Sands component of layer 1 aquifer hydraulic parameters by ±15% of the calibrated hydraulic conductivity (0.5–7 m/day) and specific yield (0.1–0.15). In accordance with the Guideline (MDBC 2001) the model was run for 100 years into the future.

6.1.1.2 Sensitivity test-1: Results

Sensitivity test results (Table 14) indicate that:

1. Changes of ±15% to the calibrated Loxton Sands hydraulic conductivity results in a predicted maximum 26 t/day change in the salt load entering River Murray 100 years into the future, which is considered insignificant in comparison to the predicted total salt load of 639 t/day (a 4% change). Figure 58 shows the model sensitivity to changes in horizontal conductivity.
2. Changes of ±15% to the calibrated Loxton Sands specific yield results in a predicted maximum 16 t/day change in the salt load entering the Monoman Formation and River Murray 100 years into the future, which is considered insignificant in comparison to the predicted total salt load of 639 t/day (a 2.5% change). Figure 59 shows the model sensitivity to changes in specific yield.

The results given in Table 14 indicate that the salt load into the River Murray is only slightly affected by changes in aquifer hydraulic parameters, and this provides confidence in using the calibrated values.

6.1.2 SENSITIVITY TEST-2: VARIATION OF BOOKPURNONG FORMATION VERTICAL HYDRAULIC CONDUCTIVITY INCREASING / DECREASING BY 15%

In the Pike – Murtho project area, vertical flux from the Murray Group Limestone aquifer to the river is considered only minor (see note below) compared to the lateral flux from the Loxton Sands aquifer. However, in order to comply with the MDBC Guideline (2001), the sensitivity to upward leakage by varying Kv in the Bookpurnong Formation (layer 2) was tested and the results included in this report.

Note: Vertical flux contributes a maximum salt load of 9 t/day at 2105 (for the worst case scenario – Scenario 5) in the entire Pike – Murtho area, and represents only 1.4% of the total salt load (639 t/day). This is based on a groundwater salinity of 20 000 mg/L for the Pata Formation.

6.1.2.1 Sensitivity test-2: Conditions

This sensitivity testing was conducted by varying the vertical hydraulic conductivity of the Bookpurnong Formation (layer 2) by ±15% of the calibrated value of 2x10-3 m/day and running the model 100 years into the future.

6.1.2.2 Sensitivity test-2: Results

Sensitivity test results (Table 14) indicate that:

Changes of ±15% to the calibrated vertical hydraulic conductivity (Kv) for Bookpurnong Formation results in a predicted maximum of 0.1 t/day change in the salt load entering the River Murray from the Pata Formation 100 years into the future in Pike – Murtho area, which is insignificant. Figure 60 shows the model sensitivity to changes in Bookpurnong Formation vertical conductivity.

Figure 61 shows the comparative model sensitivity of the three parameters tested above in the Pike – Murtho area.

Table 14. Results of sensitivity testing of variation in aquifer and aquitard hydraulic parameters - predicted salt load entering River Murray 100 years into the future

	Kh (m/day) **Loxton Sands**			**Sy** **Loxton Sands**			**Kv** (m/day) **Bookpurnong Formation**		
Parameters value	-15%	0.5–7	+15%	-15%	0.1–0.15	+15%	-15%	$2x10^{-3}$	+15%
Murtho Area									
Predicted salt load (t/day)	375.0	389.0	400.6	400.9	389.0	377.9	394.6	394.7	394.6
Difference (t/day)	14.1	–	11.6	11.9	–	11.1	0.02	–	0.02
Pike Area									
Predicted salt load (t/day)	238.0	250.3	261.0	254.6	250.3	246.0	253.7	253.6	253.5
Difference (t/day)	12.3	–	10.8	4.3	–	4.2	0.06	–	0.06

7. MODEL UNCERTAINTIES / LIKELY ERROR LIMITS

The following factors are considered to be the most important in terms of model accuracy and uncertainty in results (salt loads).

7.1 FLOODPLAIN PROCESS

The hydrogeology of the highland and floodplain areas is considered to be reasonably well understood and well represented in the model, which gives confidence to the estimates of fluxes passing from the highland irrigation areas to the edge of the floodplain. However, the detailed salt movement processes through the floodplains are less well known and were not modelled. Although there is high confidence regarding the model representation of the floodplain hydrogeology, the transmission of salt loads from the floodplain to the river is not considered to be modelled with a high level of confidence. This is because salt is intercepted and accumulated in floodplains between floods, making discharge of salt from floodplains to the River Murray on a daily basis difficult to predict.

7.2 GROUNDWATER SALINITY

The groundwater salinity values, and zones to which they have been applied in the model, represent the best understanding (as explained in section 2.6) of the groundwater salinity distribution and existing available data.

Groundwater salinity values for the individual budget zones ranging between 8000–43 000 mg/L (Fig. 7) (but minimum 9000 mg/L in the Murtho reaches) were used in the calculation of salt load in the project area. These salinity values were analysed to determine the frequency distribution of salinities applied in the model (Fig. 62). The median value for the Murtho reaches was found to be 27 000 mg/L and the mean 25 727 mg/L. If predicted salt loads entering the River Murray in 2005 in the Murtho area had been calculated using the median salinity value of 27 000 mg/L, the salt load would have been under-estimated by 5% compared with the present model predictions presented in this report.

As a check, all relevant salinity values available from the Murtho floodplains and near-river highlands were extracted from the database (47 samples in total occurred within these allocated areas adjacent to the numerical model's flow budget zones) and analysed to determine their statistical distribution. The distribution of values is shown as a histogram in Figure 63 and as a percentile distribution (Fig. 64). The median value for the whole population is 29 470 mg/L and the mean is 27 882 mg/L.

There is some evidence for a bimodal distribution indicated by the presence of two separate peaks in the histogram with the possibility of a third sub-population for values above 40 000 mg/L. This third sub-population is directly attributed to wells occurring within the floodplain environment (under the effects of evapoconcentration) as there only exists one salinity value derived from a highland well, which exceeds 35 000 mg/L (Site 56P with a lab determined TDS of 37 700 after 29 days of pumping at 8 L/S).

The median value for the whole population is 8% higher than the model zone median but if Zones 14 and 18, which make no contribution to the dataset describing the whole population, are omitted then the revised median value of the model zones becomes 28 500 mg/L (see Fig. 65) which is only 3% less than the whole population median (29 470 mg/L).

Using the revised median zone value of 28 500 mg/L with the modelled 2005 fluxes gives a salt load of 103 t/day which is the same as the sum of the modelled zone salt loads over the Murtho reach.

Further, it should be noted that groundwater salinity may vary in the future in response to accessions from brackish irrigation drainage and the effects of groundwater pumping from SIS.

7.3 RECHARGE DUE TO IRRIGATION

Model recharge rates and irrigation areas in the future are considered to be key contributors to model uncertainty.

There is reasonably high confidence in the recharge rates used for the historical modelling. The recharge rates applied took account of Aquaterra's calculated accession volumes but were adjusted to achieve improved calibrations of observed hydrographs.

The difficultly for predictive modelling is that a large volume of irrigation drainage, due to previous irrigation (particularly in the Murtho area), has passed the root zone but has not yet reached the water table. Long lag times and limited available calibration data adversely affects the confidence in predictive modelling.

There is also less confidence in the recharge values used in the predictive modelling beyond 2005. The SIMPACT predicted recharge rate of 100 mm/yr was used for the 'future development' predictions. It is highly likely that there will be changes in irrigation efficiency (that will affect recharge-accession) and irrigated area and therefore deviations from the assumed development sequence in the future.

7.4 HYDRAULIC PARAMETERS

As an attempt to quantify the uncertainty associated with the Loxton Sands and Bookpurnong Formation hydraulic parameters, the sensitivity analyses in section 6 was conducted. The percentage change in the model salt loads that is attributable to variations in aquifer and aquitard hydraulic parameters, are shown graphically in Figures 58–60. The comparative sensitivity to the parameters is shown in Figure 61.

It should be noted that the aquifer and aquitard hydraulic parameters are considered to be reasonable, and considered as high confidence parameters in comparison to the other parameters discussed above.

8. MODEL LIMITATIONS

Hugh Middlemis (lead author Murray Darling Basin Commission 2001 Groundwater Modelling Guideline) stated in 2004 that: *It is important to recognise that there is no such thing as a perfect model, and all models should be regarded as works in progress of continuous improvement as hydrogeological understanding and data availability improves. By definition, model limitations comprise relatively negative statements, and they should not necessarily be viewed as serious flaws that affect the fitness for purpose of the model, but rather as a guide to where improvements should be made during work.*

These model limitations are not considered to seriously affect the function of model for predictive purposes. They serve as a guide for where improvements could be made in the future with the availability of additional data or with the improvement of hydrogeological understanding.

The following limitations may introduce a component of error associated with the predictive modelling results:

1. The model layers are a simplified representation of the natural aquifers and aquitards thickness and hydraulic parameters, and may not reflect the natural conditions with sufficient accuracy.
2. According to MDBC requirements, daily pool level fluctuations were not simulated in the model, which results in average values of salt load entering the River Murray.
3. Flood events were not required by the MDBC to be simulated in the model.
4. Floodplain processes of salt storage and release process were not modelled.
5. The proposed SIS is based on generalised aquifer hydraulic parameters and it is likely that the final production well spacing will be different to that modelled.
6. Groundwater salinities are assumed to remain constant when predicting future salt loads entering the river. However, groundwater salinity will most likely change in the future in response to accessions from brackish irrigation drainage and the effects of SIS.
7. Model recharge zones and rates are likely to be different in the future to those used in predictive modelling.

9. CONCLUSIONS

DWLBC has significantly revised and further calibrated the numerical groundwater flow model reported in REM-Aquaterra (2005b). The model is capable of simulating the regional aquifer system in the Pike – Murtho area. This model is an 'impact assessment model of moderate complexity' in the terminology of the MDBC (2001). The model accommodates the Pike - Murtho area within a broad regional context.

The model has been accurately calibrated for the Pike – Murtho using observed (historical) potentiometric heads. Sensitivity analysis, as specified by the Guideline (MDBC 2001), has been undertaken for transient conditions.

The Pike – Murtho (DWLBC) model has been significantly improved by the following actions:

1. The creek system on Woolenook floodplain has been simulated and treated as a path for salt into the River Murray.
2. Lock-6 has been simulated in the model.
3. Salinity zones have been reviewed and further discretised in the Murtho area.
4. Conductivity values and zones in the Murtho highland have been changed according to recent investigations.
5. Recharge zones and rates have been adjusted to achieve better calibration results (matching observed hydrographs).
6. Irrigation drainage wells have been included in the model in the Murtho area.
7. Potential seepage has been simulated in the model at the edge of floodplain in the Lyrup and North Murtho areas.

The net result has been a significant improvement of calibration results in the Pike and Murtho areas.

9.1 MODELLING RESULTS

The modelling work has resulted in an improved understanding of the hydrogeology of the aquifer system in the Pike – Murtho are. The model has been used to predict the flux of saline groundwater (salt load) entering the River Murray under different irrigation practices and development scenarios. Model results (salt loads) can be seen in Figures 56 and 57 and in Tables 15 and 16.

Most prediction results for salt loads entering the River Murray are similar to those reported in REM-Aquaterra (2005b). The major difference is in the future development scenario (Scenario-5) in the Murtho area. The reason for the difference may due to the fact that DWLBC adopted the SIMPACT recharge rate of 100 mm/yr, while Aquaterra used higher rates. This difference also has some effect on the SIS scenario (Scenario-6).

Table 15. Summary of predicted salt load (t/day) entering the River Murray (Murtho Area)

	Year				
	1988	**2000**	**2005**	**2050**	**2105**
S–1	32.0	32.0	32.0	32.0	32.0
S–2	32.7	32.9	33.0	34.0	39.8
S–3A	99.5	123.6	135.2	278.3	300.9
S–3B	99.5	123.5	103.0	140.4	138.2
S–3C	99.5	123.5	103.0	140.4	138.2
S–4	99.5	123.5	103.0	174.0	234.7
S–5	99.5	123.5	103.0	174.0	389.0
S–6	99.5	123.5	103.0	29.6	76.0

Table 16. Summary of predicted salt load (t/day) entering the River Murray (Pike Area)

	Year				
	1988	**2000**	**2005**	**2050**	**2105**
S–1	63.5	63.5	63.5	63.5	63.5
S–2	65.8	67.0	67.8	75.1	88.1
S–3A	149.7	160.9	165.6	226.4	237.6
S–3B	149.7	160.3	149.8	152.6	156.1
S–3C	149.7	160.3	149.8	152.6	156.1
S–4	149.7	167.1	156.0	181.2	192.7
S–5	149.7	167.1	156.0	188.9	250.3
S–6	149.7	167.1	156.0	63.4	74.9

9.2 GROUNDWATER MANAGEMENT SCHEMES

At the time of writing, the Pike – Murtho SIS is still at a concept design stage and will undergo further investigation to advance to a preliminary design stage. In general terms, this scheme involves the construction of a curtain of production wells completed within the Loxton Sands and Monoman Formation on the eastern side of the River Murray to control the flux of saline groundwater from highland irrigation areas.

Scenario-6 predicts that the concept SIS in the Murtho area will reduce the 2105 salt load of 389 t/day entering the River Murray to 76 t/day, a reduction of 80%. The concept SIS in the Pike area is predicted to reduce the 2105 salt load of 250 t/day entering the River Murray to 75 t/day, a reduction of 70%.

Note: The concept SIS was primarily designed by REM-Aquaterra (2005b) as a 50-year scheme, hence does not fully intercept the future development flux that is predicted after 2050.

The predicted maximum SIS pumping flux is 129 L/s in the Murtho area and 96 L/s in the Pike area. SIS pumping rates have been estimated for each well and this is shown in Appendix B.

9.3 RECOMMENDATIONS

The following work is recommended to address some of the model limitations:

1. Refine salinity zones applied in the model - review existing data and obtain new data. This has been done in the Murtho area but has not been undertaken in the Pike area.
2. Install more observation wells to obtain groundwater level data where data is absent or sparse, particularly in the Upper Pike and North Murtho irrigation areas.
3. Improve the understanding of the conceptual hydrogeological model for the Salt Creek area.
4. Further investigation in the Mid Pike lowland area to resolve differences between modelled and observed heads.
5. Further field investigations to resolve conceptual data gaps in key areas.
6. Consider SIS design on the Pike-Mundic floodplain near Simarloo.

The effectiveness of the Pike – Murtho SIS will be dependent on the successful implementation and monitoring of the proposed interception wells. At the first 5-year review the SIS needs to be carefully reviewed, and the model re-run with the actual on ground works accurately represented, to ensure that the salt load reduction presented in this report are being achieved by both SIS schemes.

FIGURES

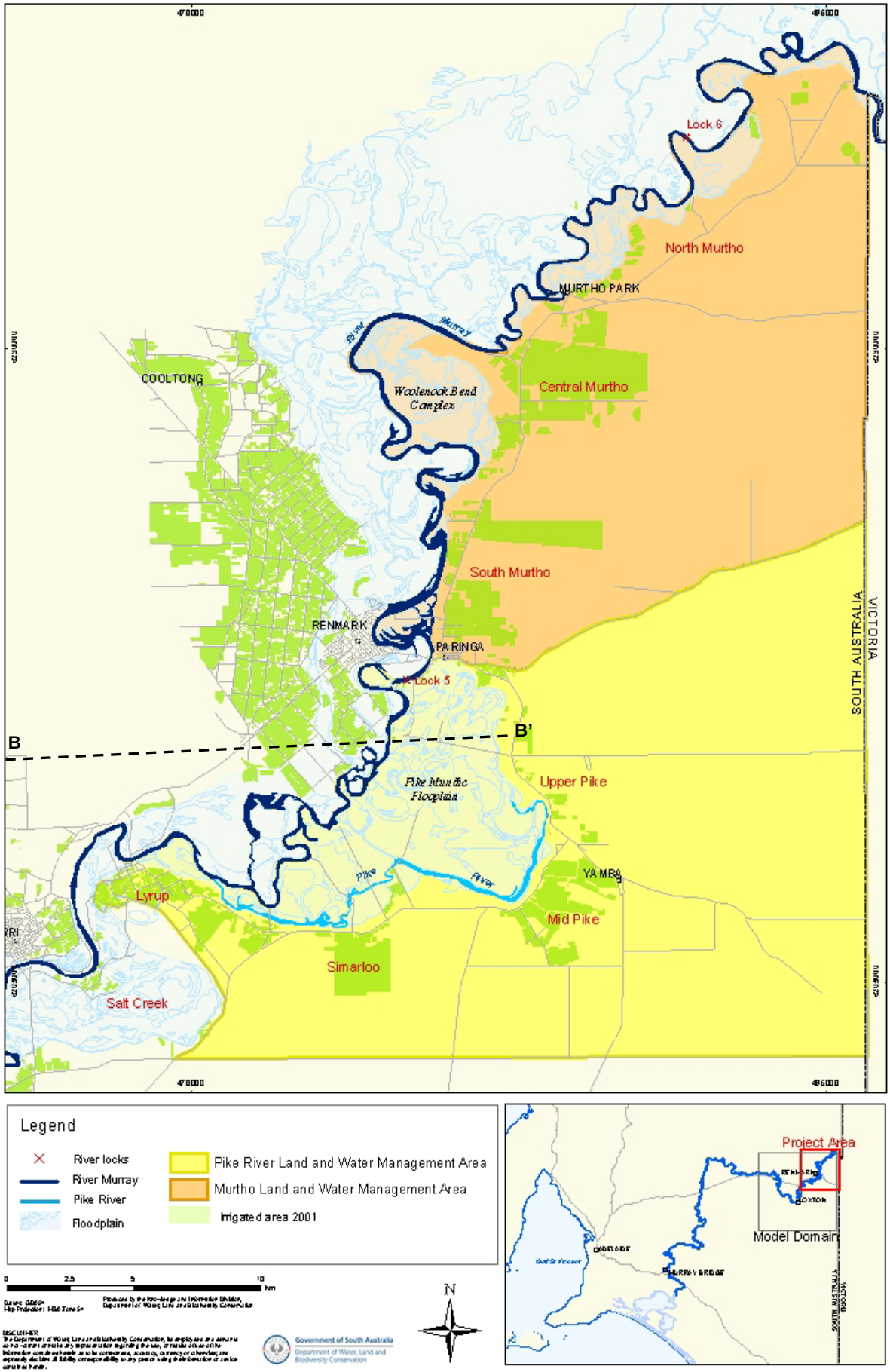
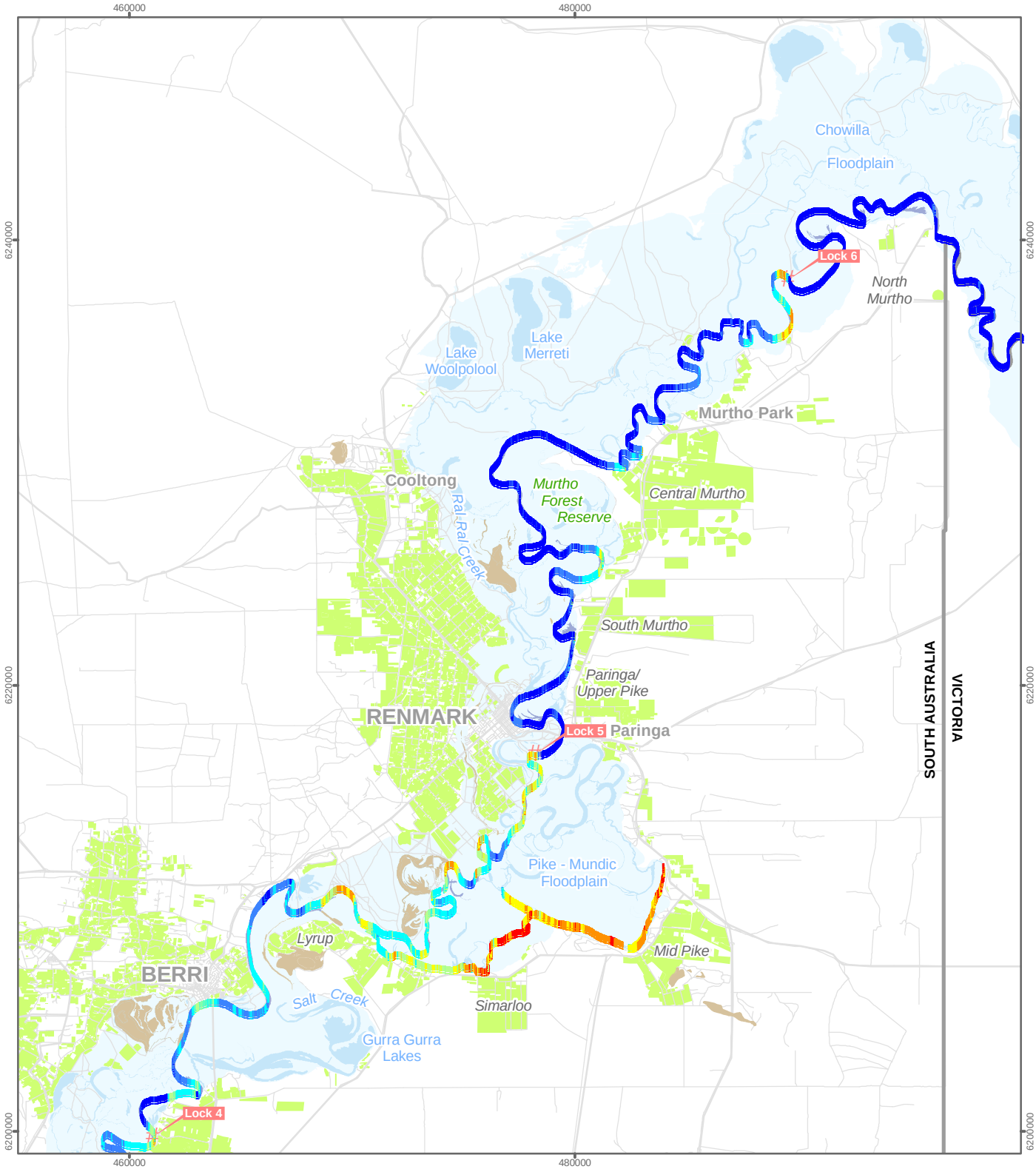


Figure 1: Project site map and model Domain



Locks
Roads
River Murray
Wetlands
Evaporation basins
River Murray Floodplain (1956 flood extent)
Irrigated areas (2003)

Resistivity (ohm-m)

- less than 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 10
- 10 - 20
- greater than 20

μ

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GDA

0 1 2 3 4 5 Kilometres

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Figure 2: Transient electro-magnetic survey results

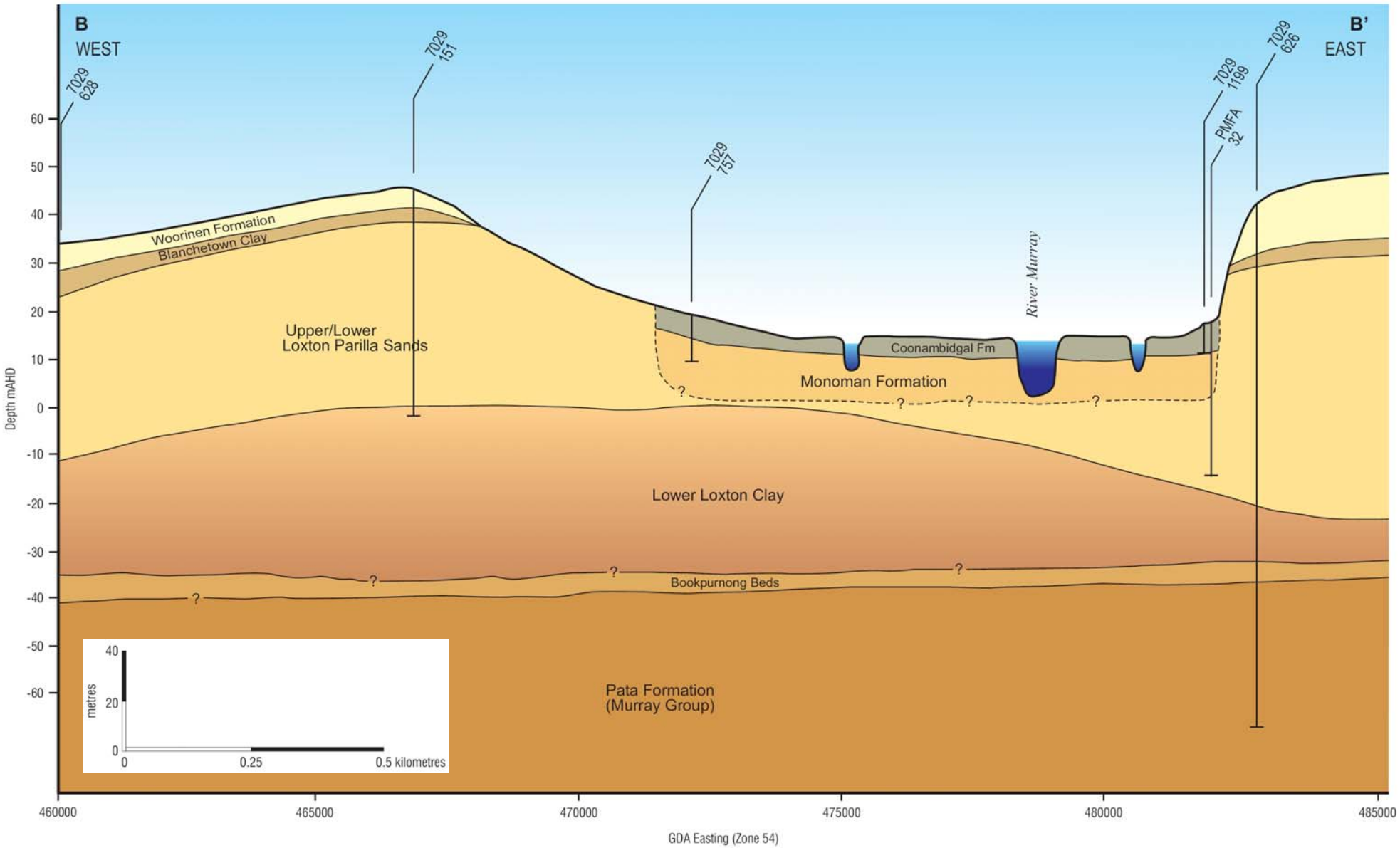


Figure 3: Hydrogeological cross-section (See Figure 1 for line of section) (REM-Aquaterra 2005a)

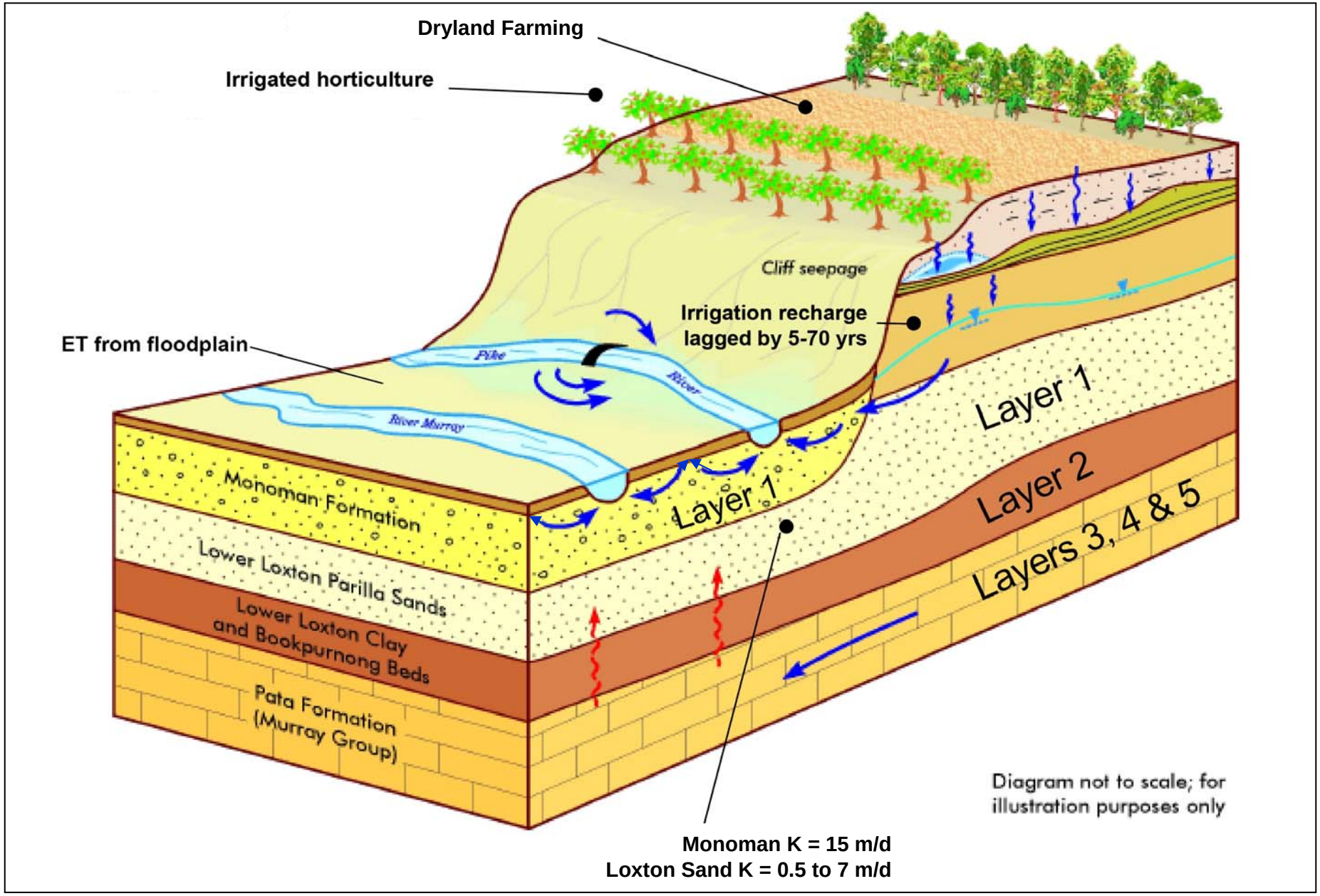


Figure 4: Elementary conceptual hydrogeological model and numerical model structure (after REM-Aquaterra 2005b)

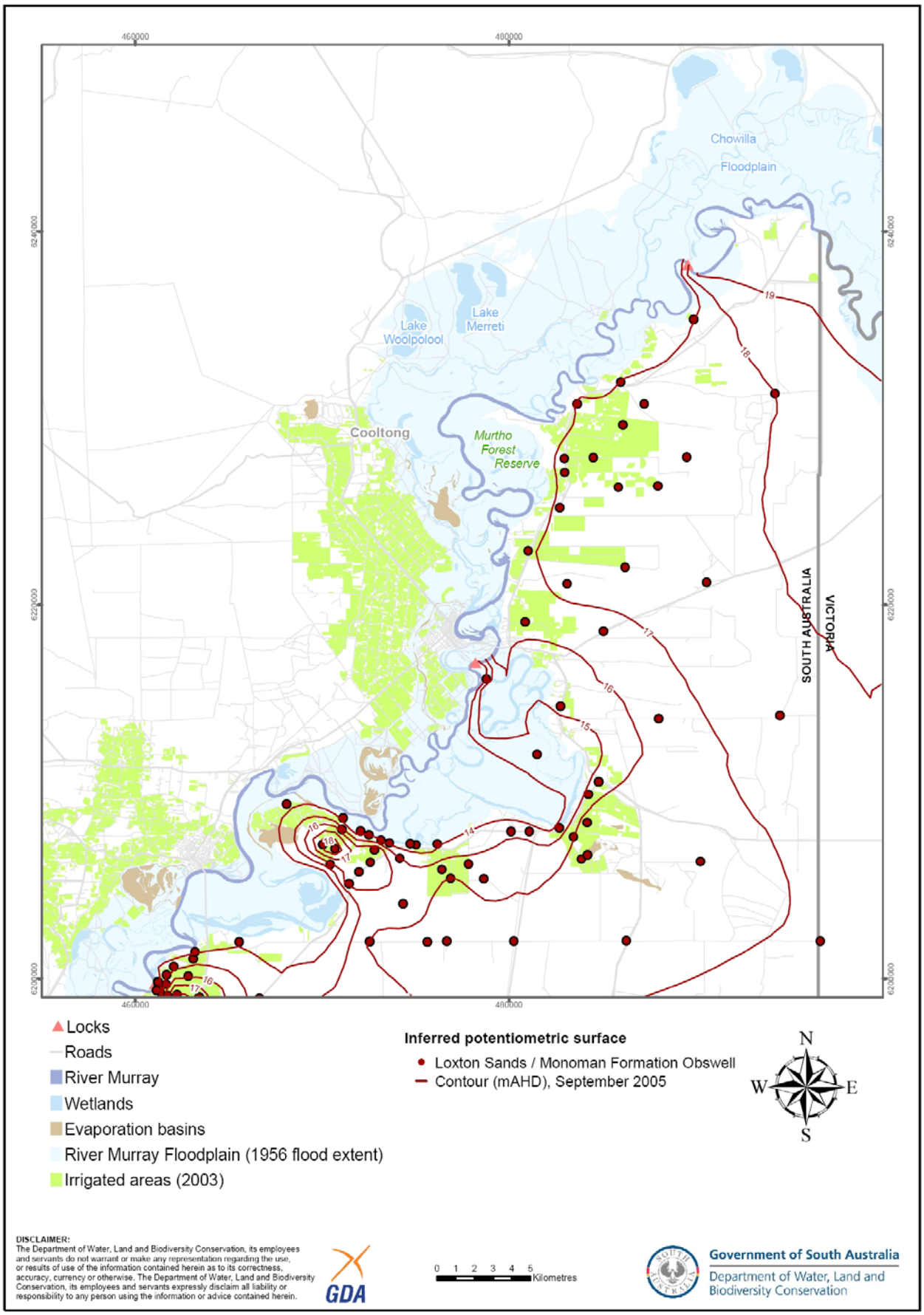


Figure 5: Loxton Sands and Monoman Formation potentiometric surface, September 2005

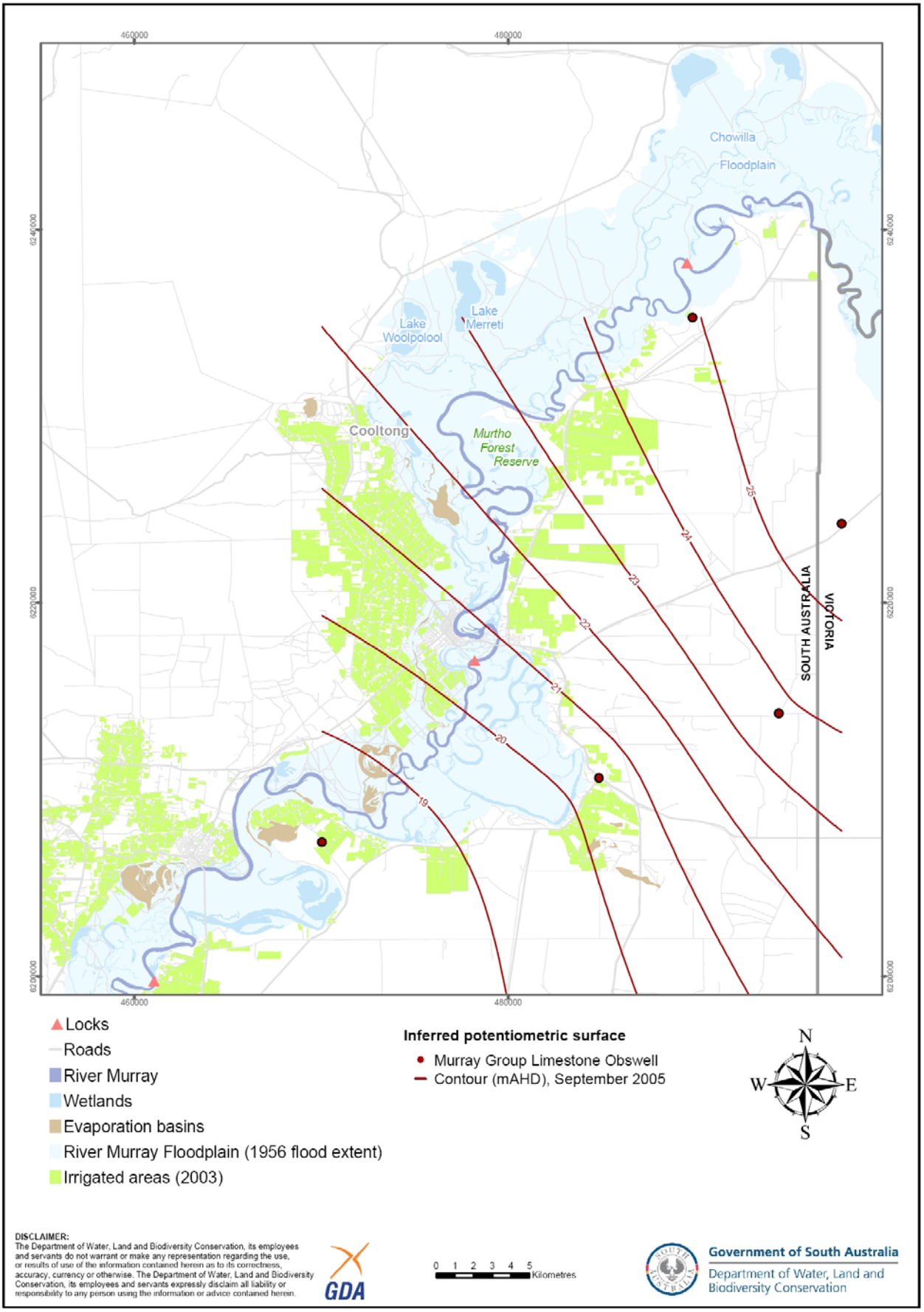


Figure 6: Murray Group Limestone potentiometric surface, September 2005

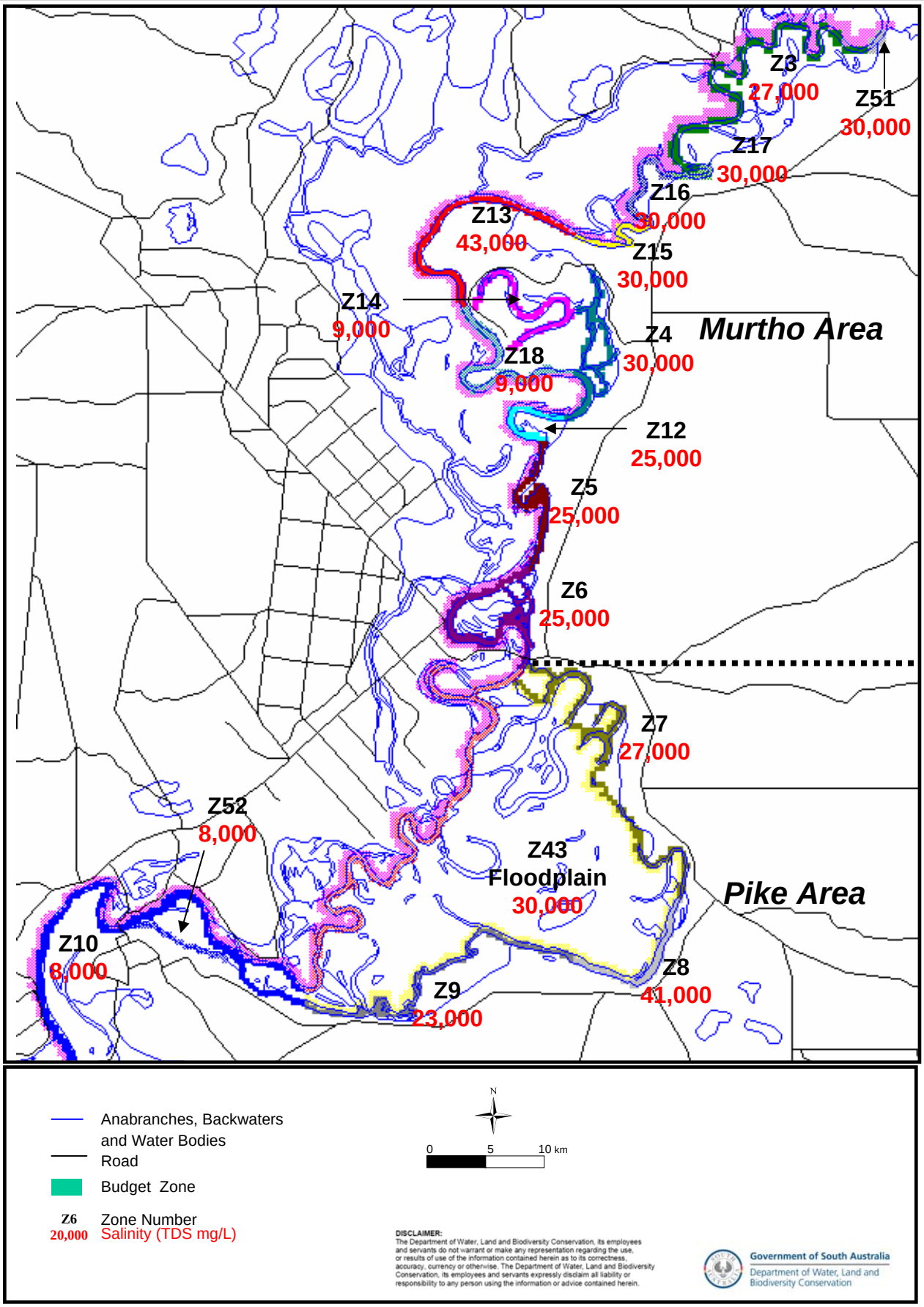
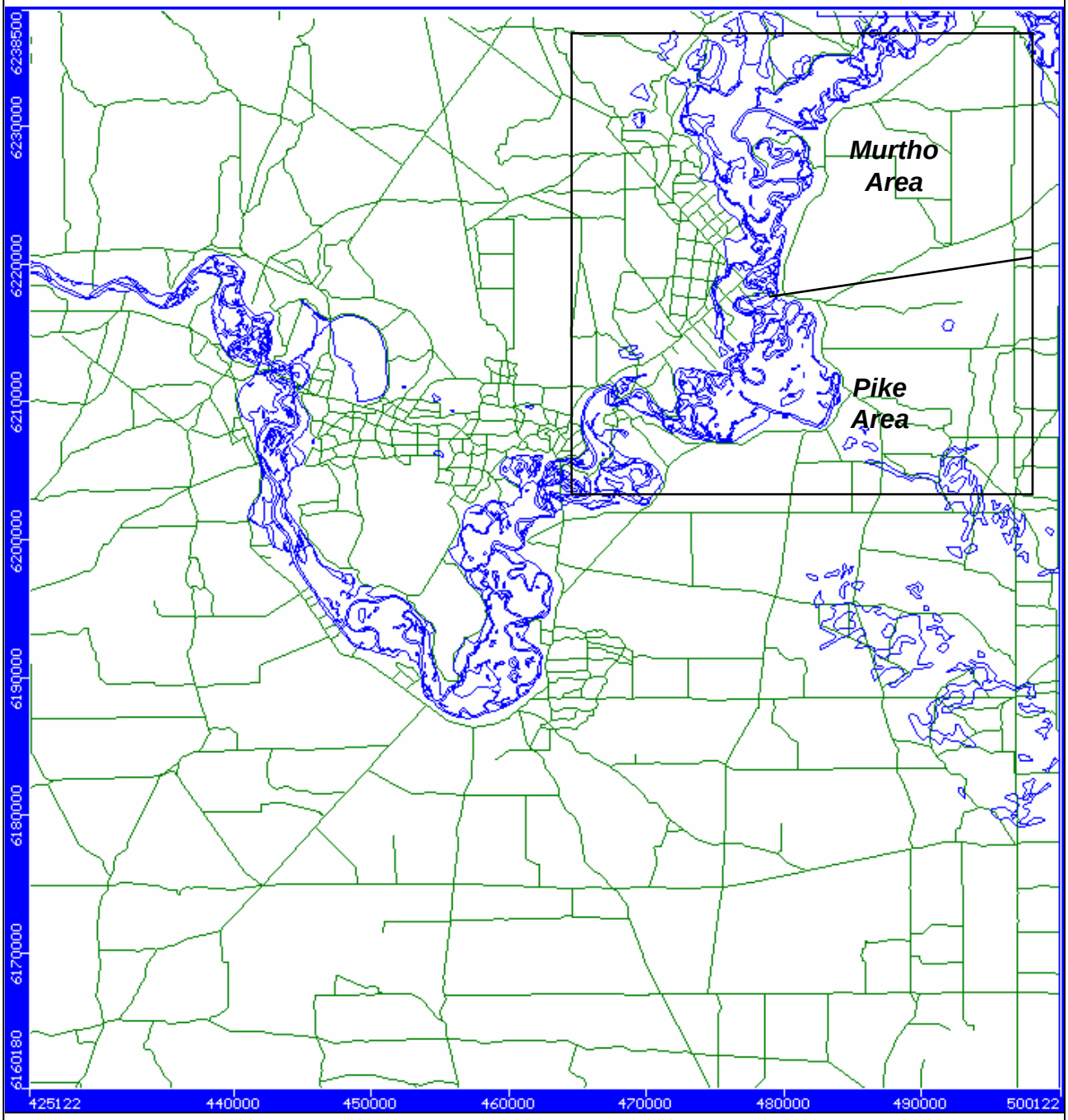


Figure 7: Flow budget zones (model layer 1) and groundwater salinity values (TDS mg/L) in the Pike - Murtho area



Anabranches, Backwaters and Water Bodies

Roads

Project Area

N

0 5 10 km

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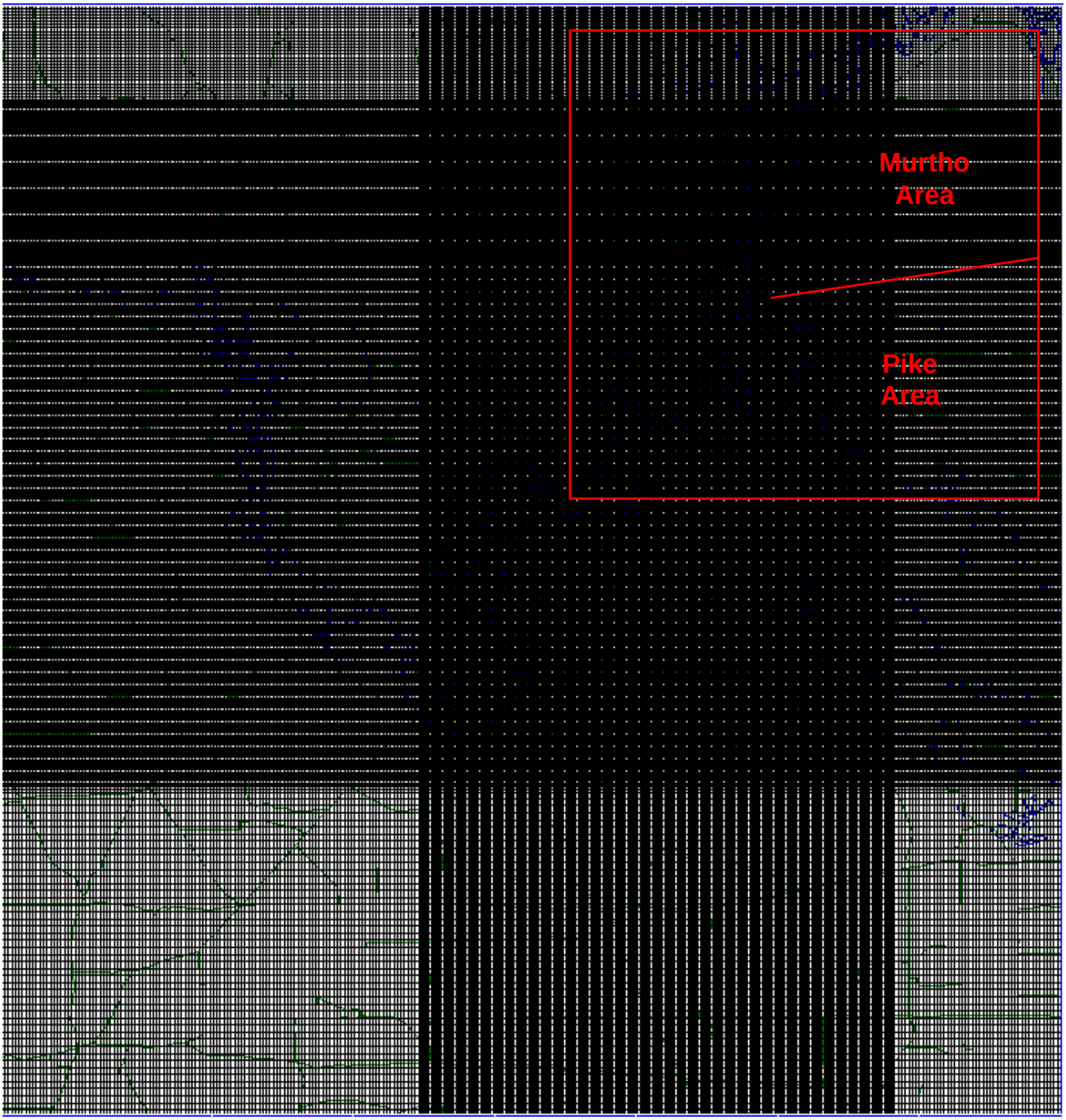
Figure 8: Regional model domain and project area



Anabranches, Backwaters and Water Bodies

Gridlines

Project Area

N

0 5 10 km

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Figure 9: Model grids

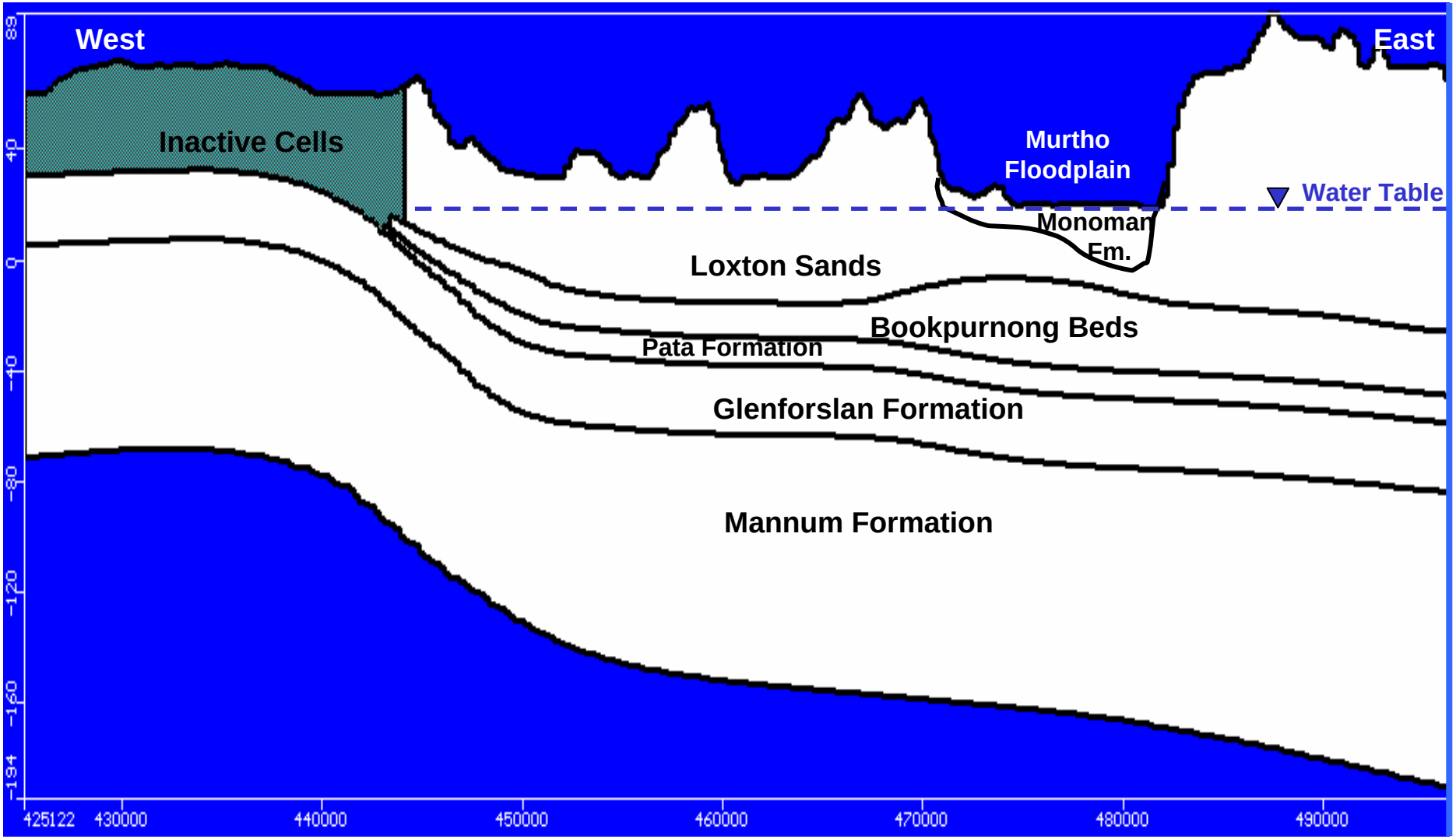
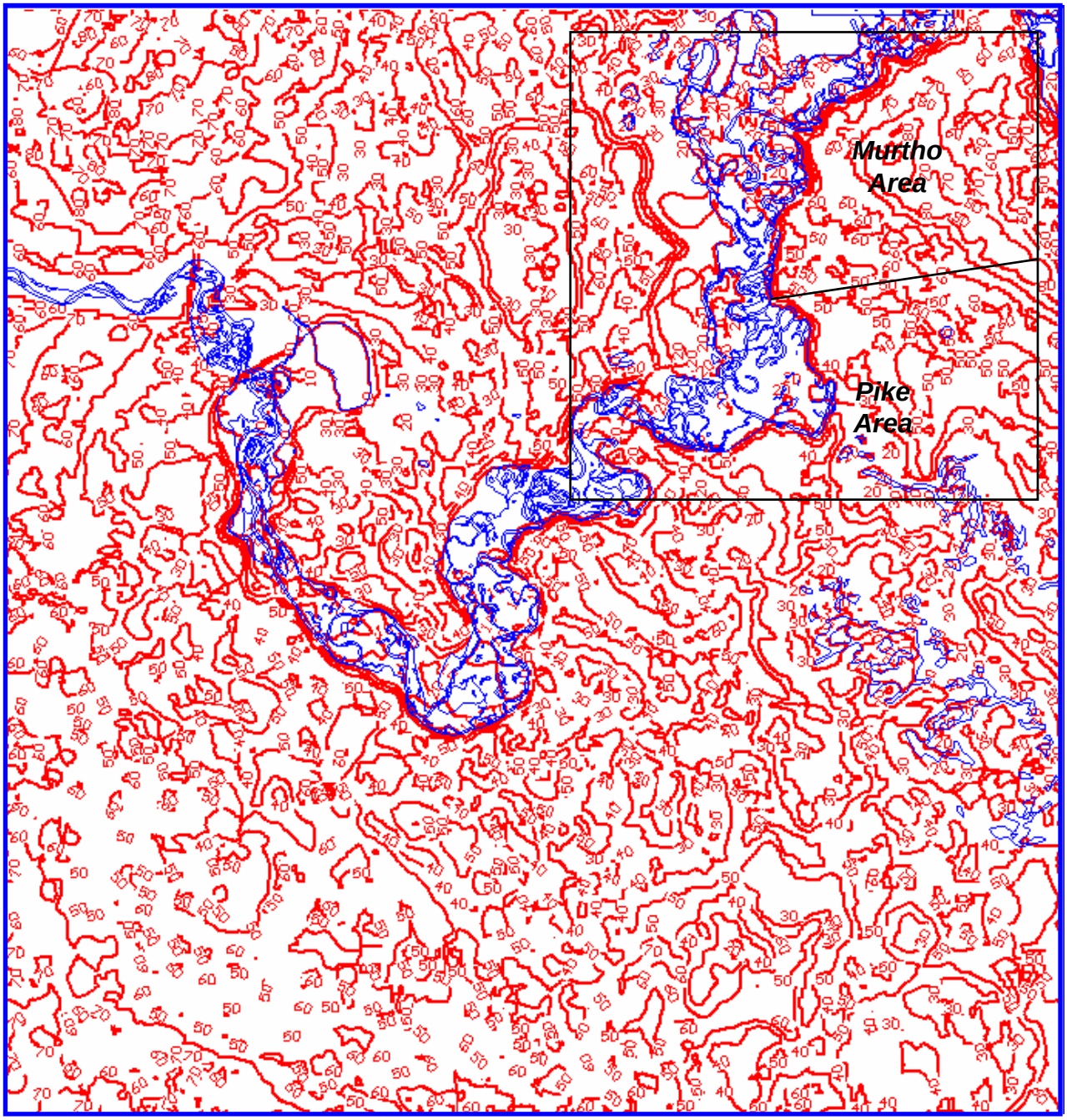


Figure 10: Model layers (Cross section through model row 76, approx. N6226370)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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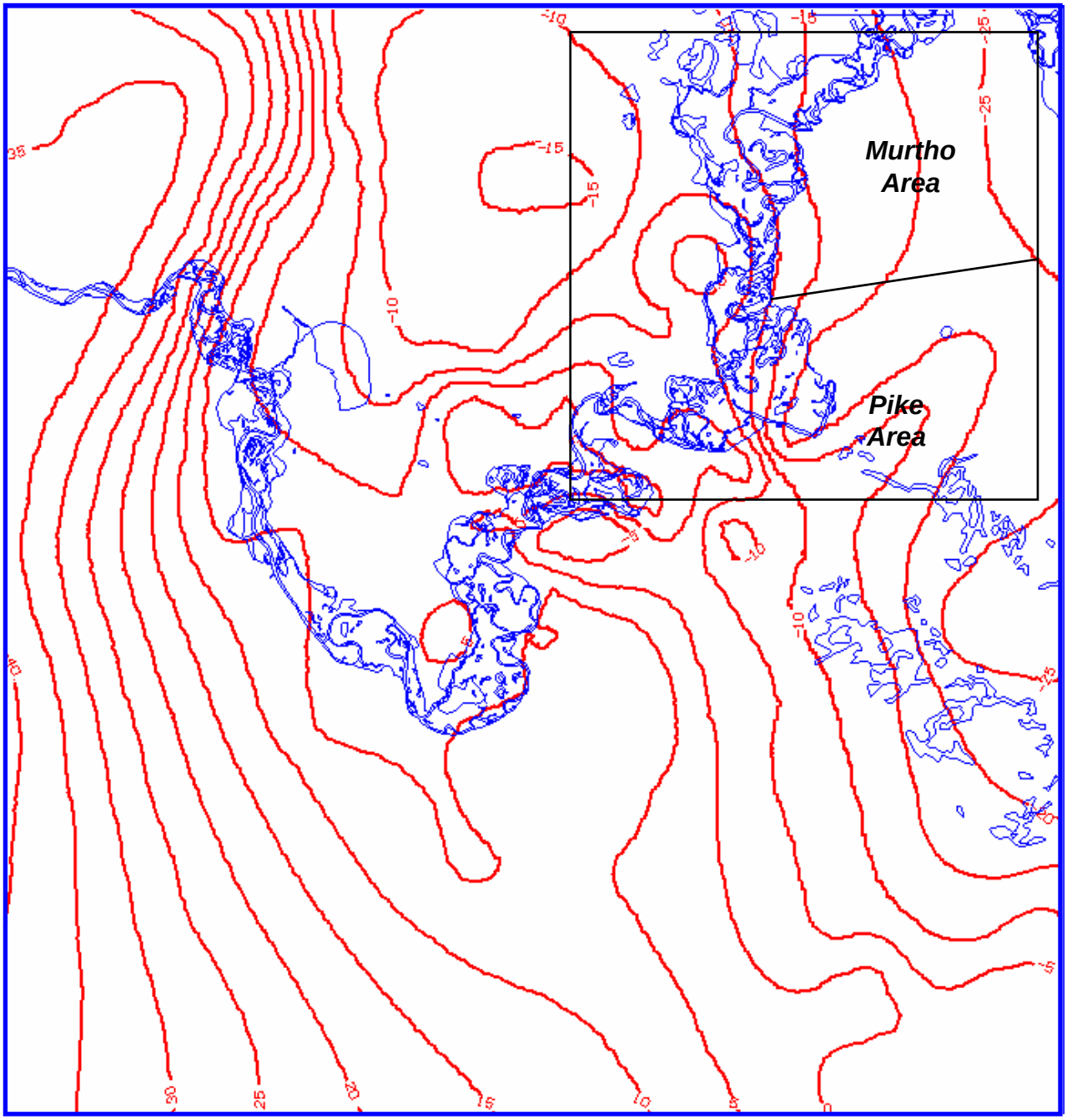
Figure 11: Ground surface elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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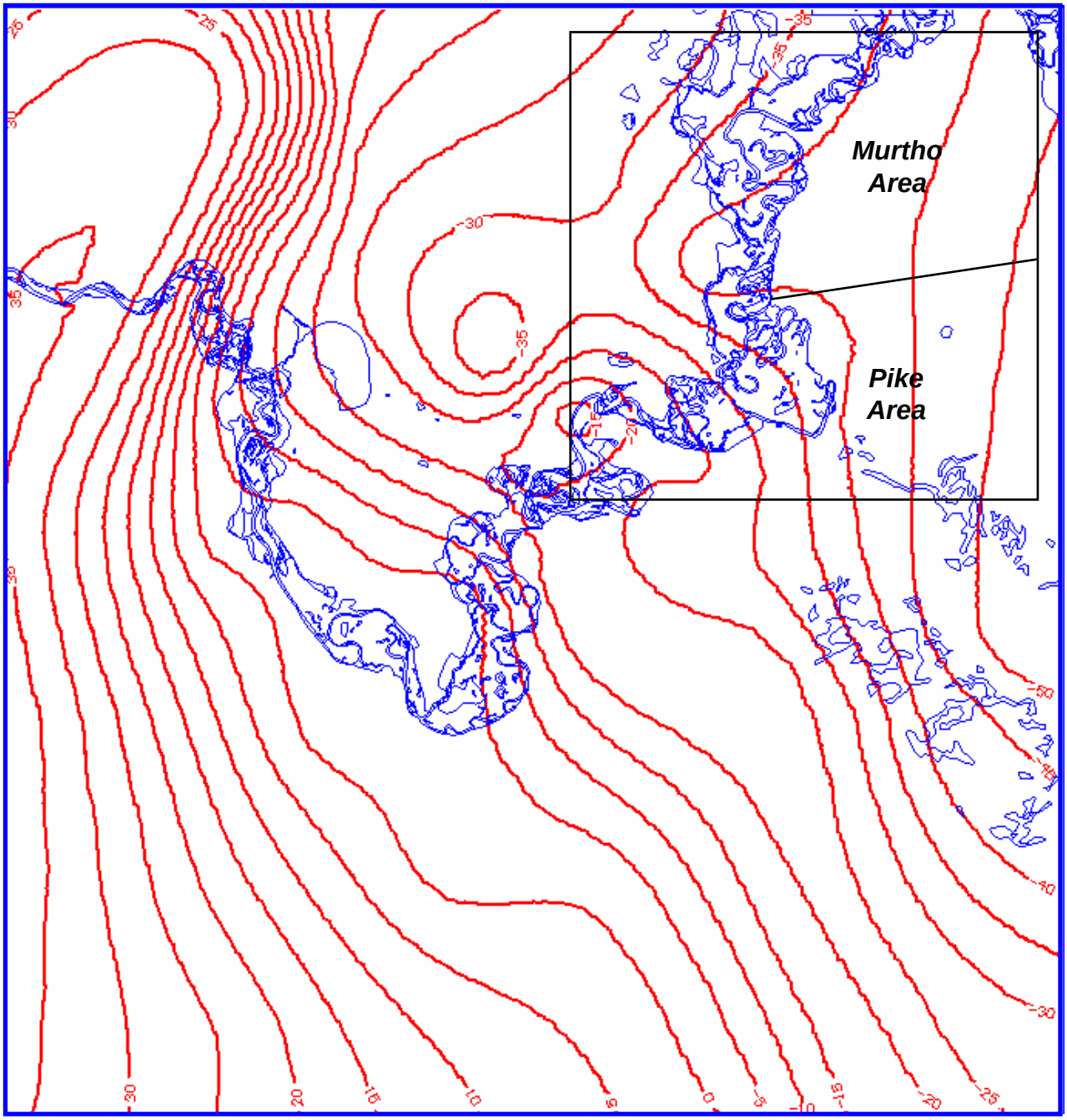
Figure 12: Top of model layer 2 elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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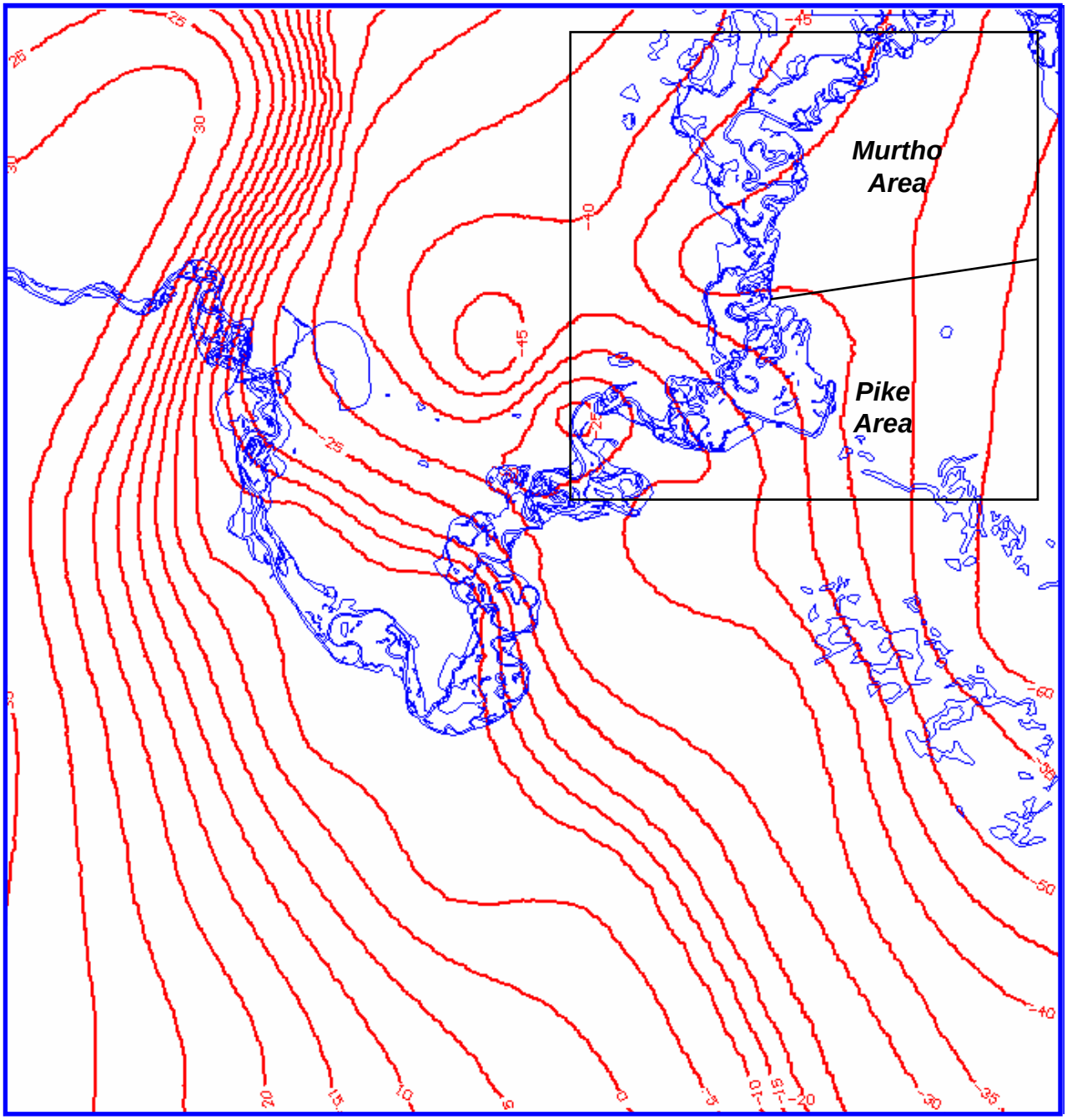
Figure 13: Top of model layer 3 elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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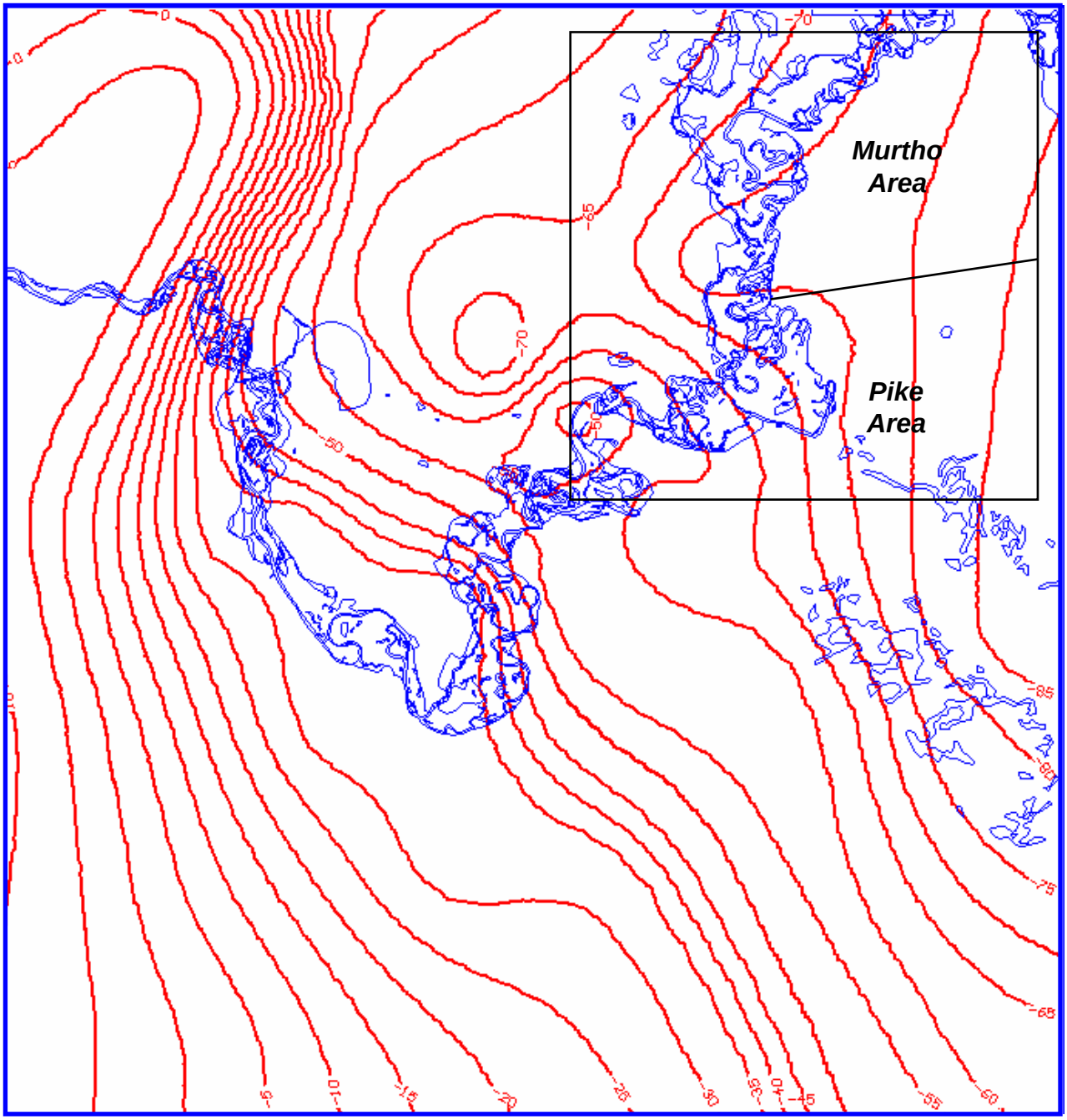
Figure 14: Top of model layer 4 elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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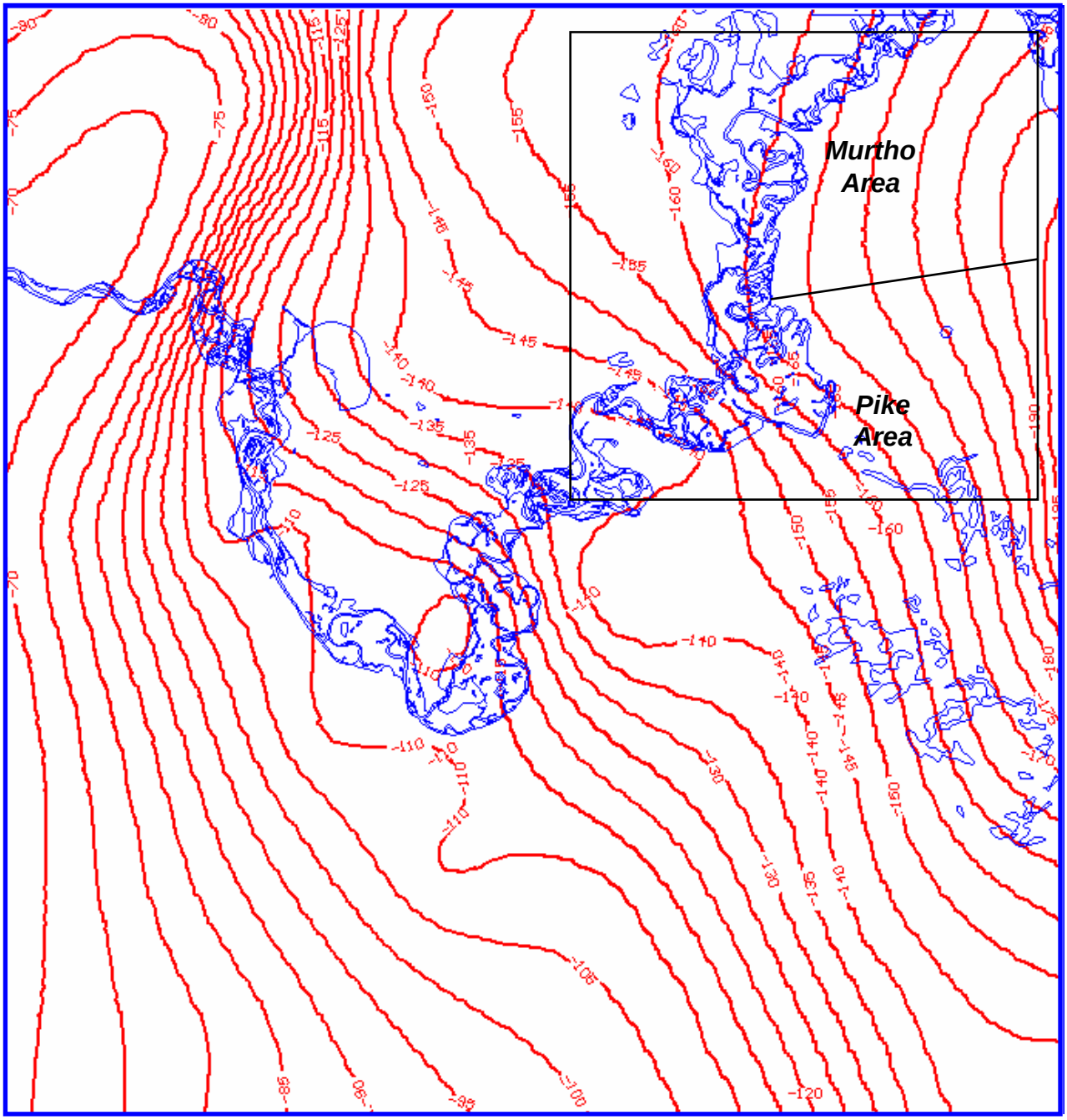
Figure 15: Top of model layer 5 elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

Elevation Contours (m AHD)

Project Area

N

0 5 10 km

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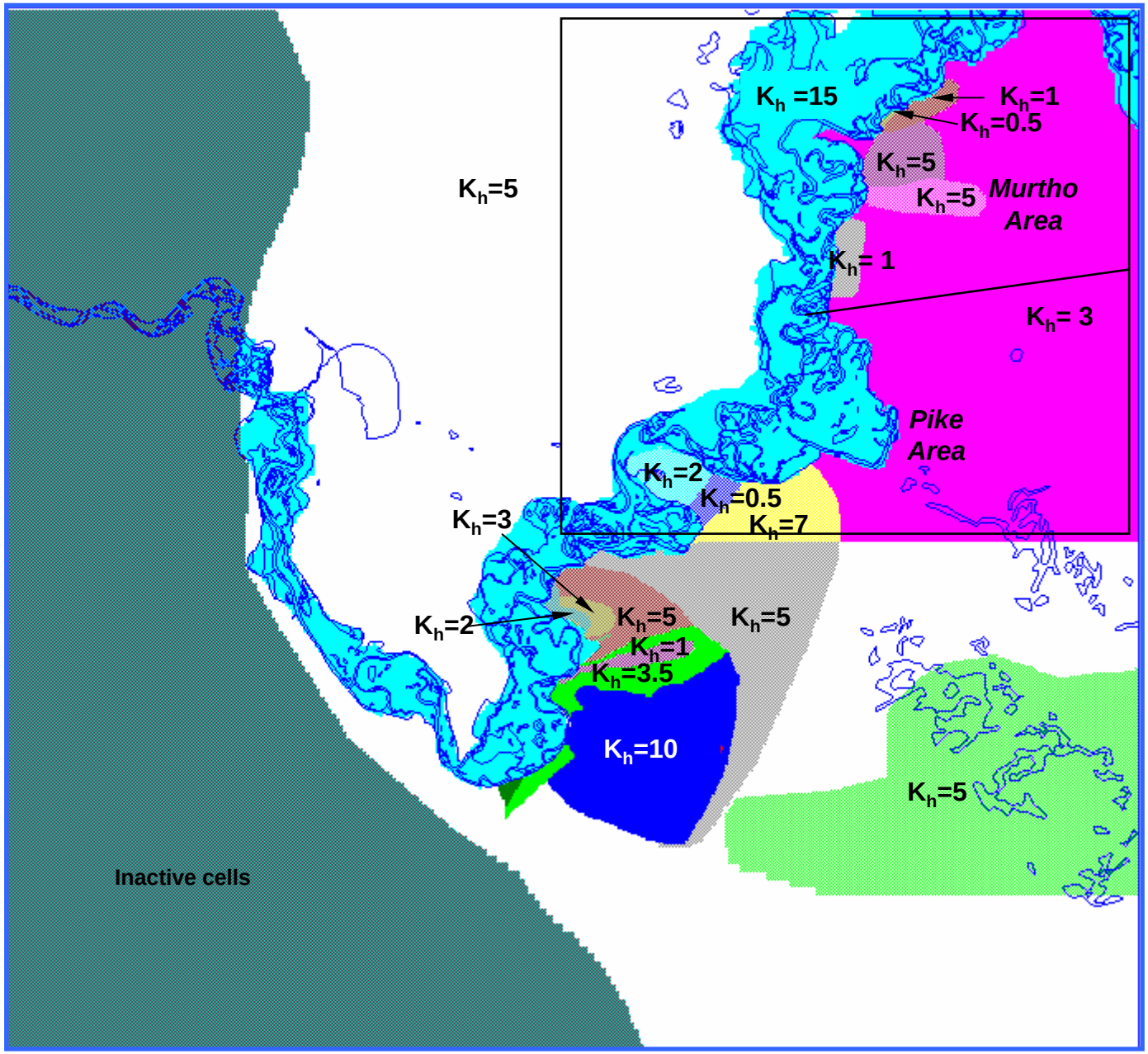
Figure 16: Base of model layer 5 elevation contours (m AHD)



Anabranches, Backwaters and Water Bodies

K_h Horizontal Hydraulic Conductivity (m/day)

Project Area

N

0 5 10 km

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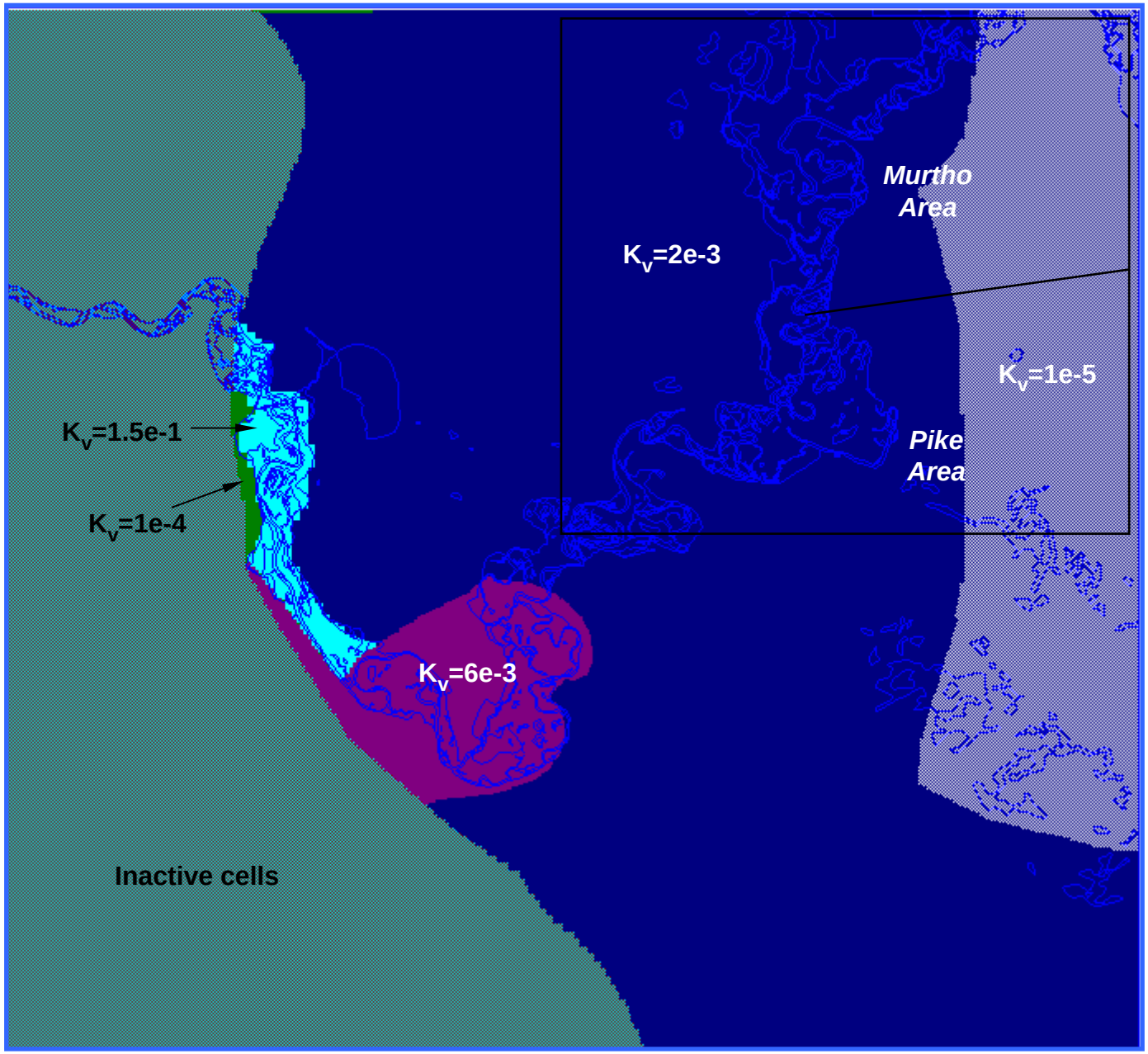
Figure 17: Model hydraulic conductivity zones and values (layer 1)



Anabranches, Backwaters and Water Bodies

K_v Vertical Hydraulic Conductivity (m/day)

Project Area

N

0 5 10 km

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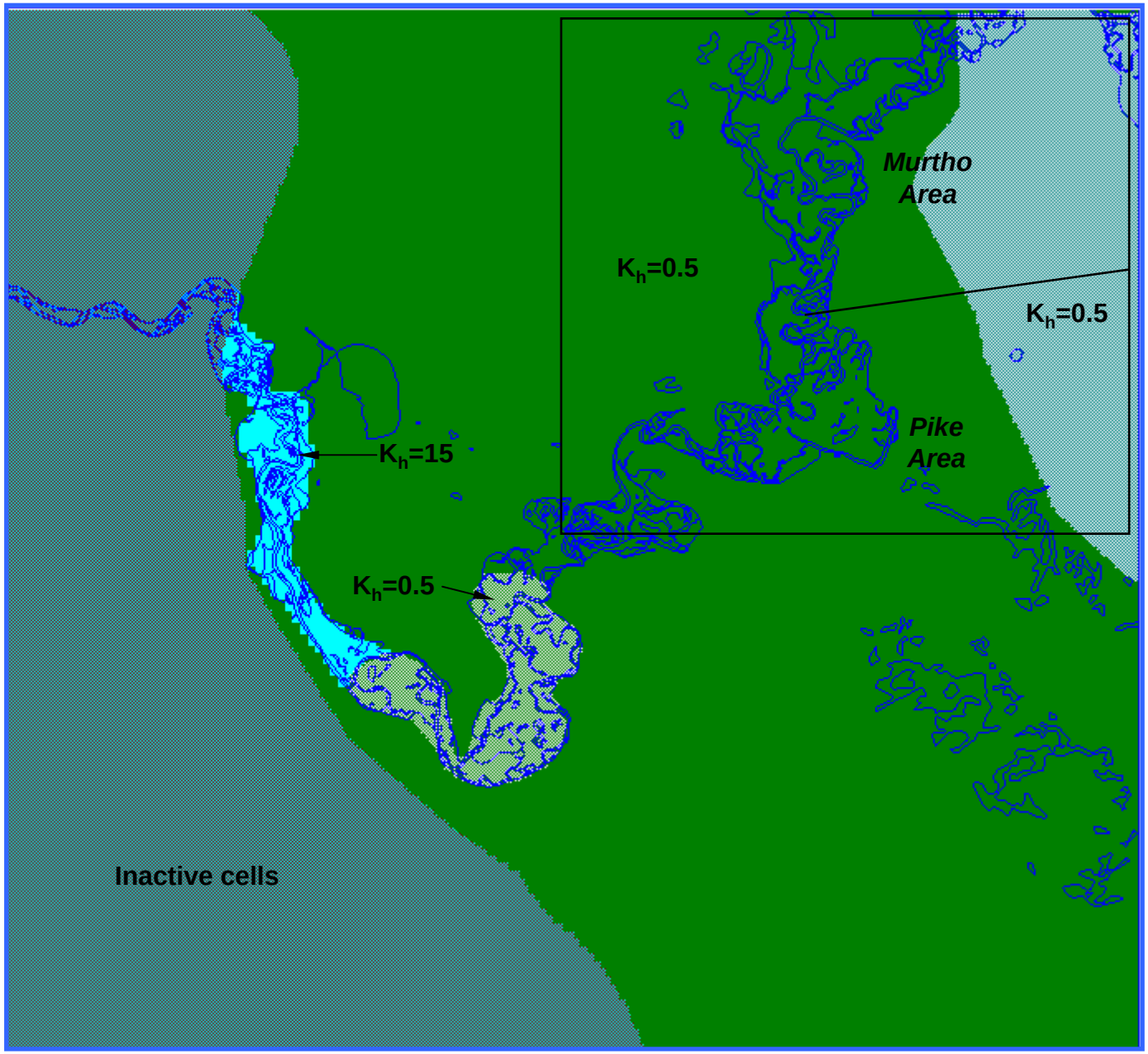
Figure 18: Model hydraulic conductivity zones and values (layer 2)



Anabranches, Backwaters and Water Bodies

K_h Horizontal Hydraulic Conductivity (m/day)

Project Area

N

0 5 10 km

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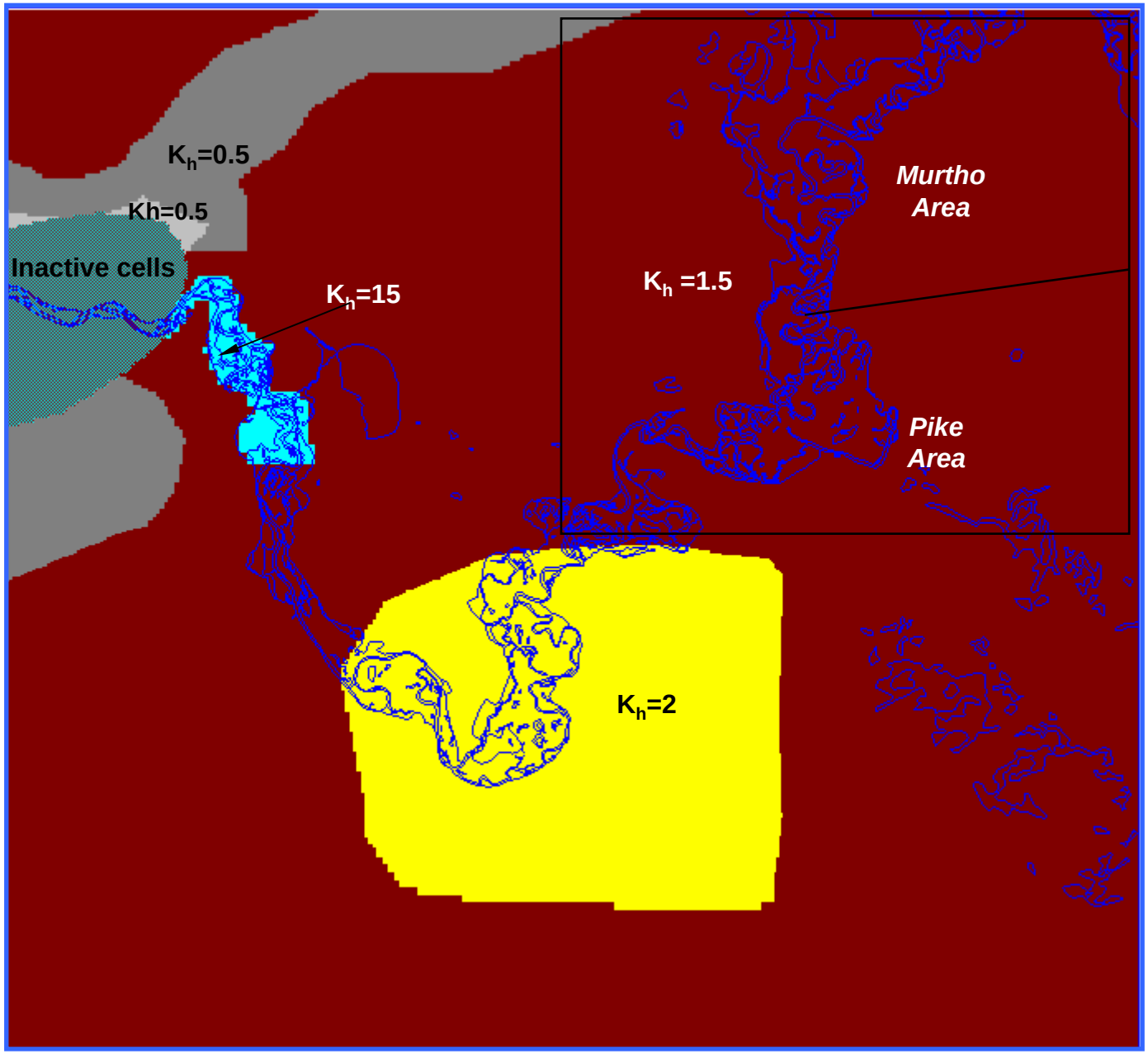
Figure 19: Model hydraulic conductivity zones and values (layer 3)



Anabranches, Backwaters and Water Bodies

K_h Vertical Hydraulic Conductivity (m/day)

Project Area

N

0 5 10 km

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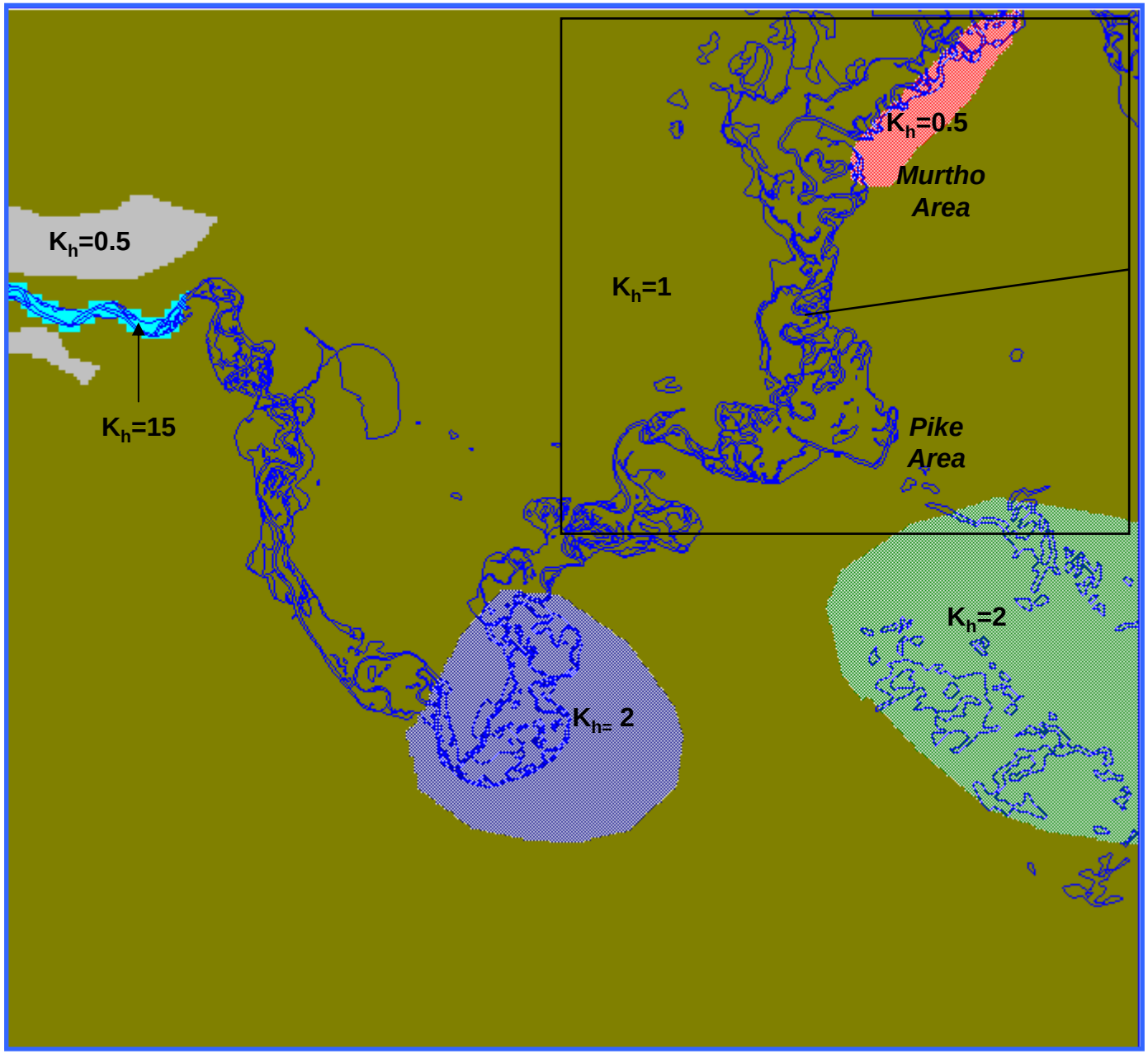
Figure 20: Model hydraulic conductivity zones and values (layer 4)



Anabranches, Backwaters and Water Bodies

K_h Horizontal Hydraulic Conductivity (m/day)

Project Area

N

0 5 10 km

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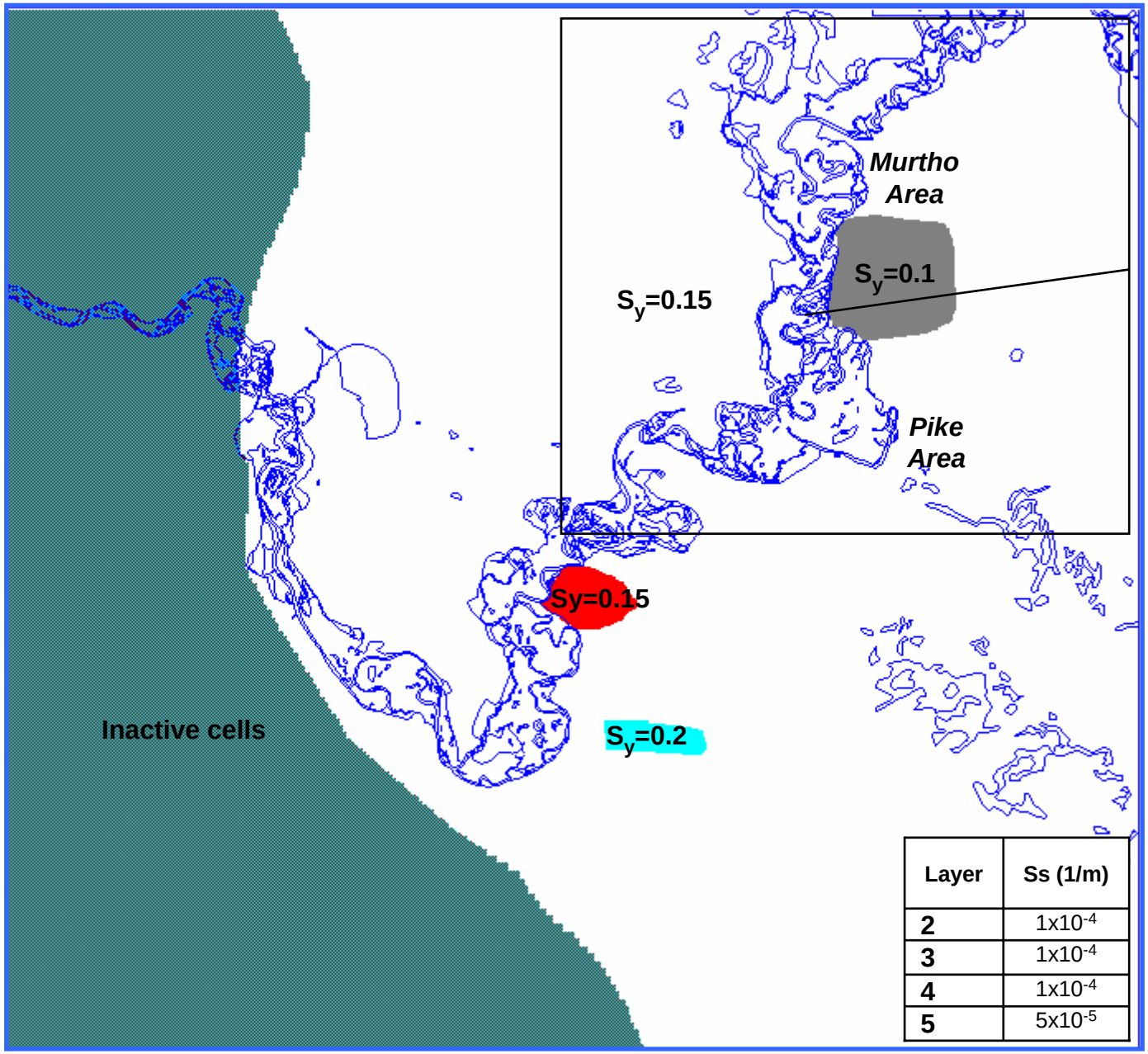
Figure 21: Model hydraulic conductivity zones and values (layer 5)



Layer	Ss (1/m)
2	$1x10^{-4}$
3	$1x10^{-4}$
4	$1x10^{-4}$
5	$5x10^{-5}$

Anabranches, Backwaters and Water Bodies

S_y Specific Yield

Project Area

N

0 5 10 km

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Figure 22: Model specific yield zones and values (layer 1) (Table gives Specific Storage [S_S] in lower layers)

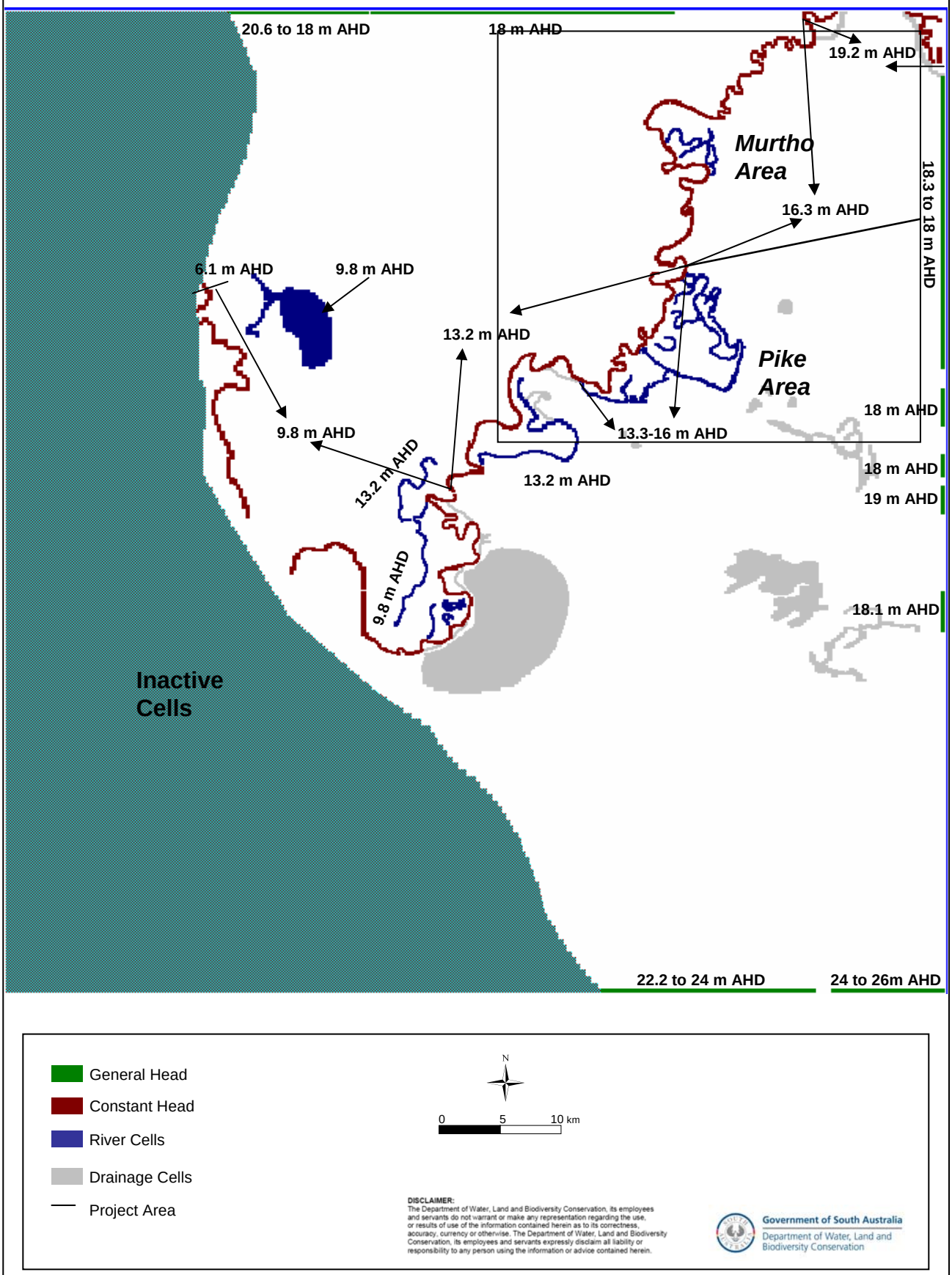


Figure 23: Model boundary conditions (layer 1)

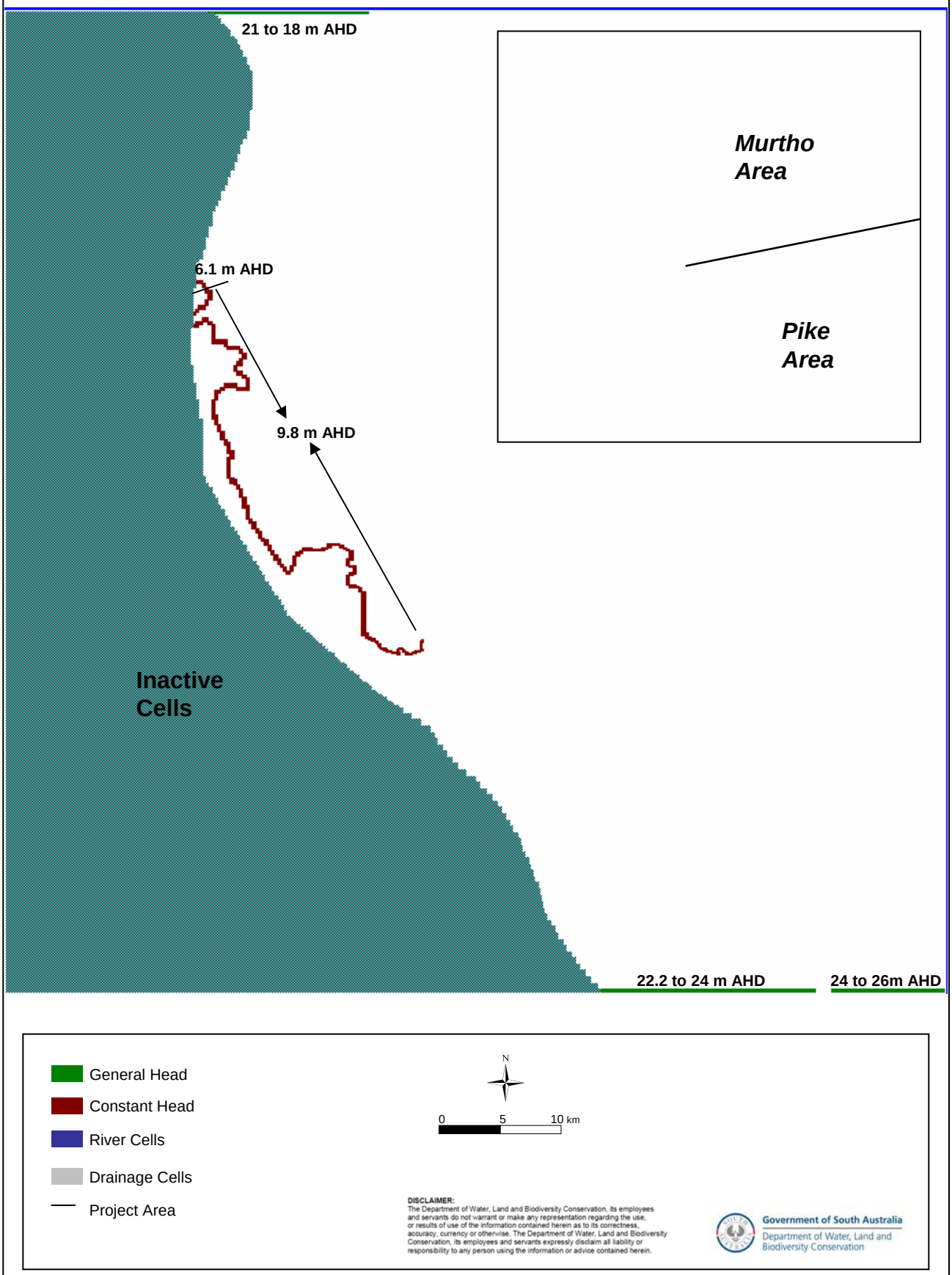


Figure 24: Model boundary conditions (layer 2)

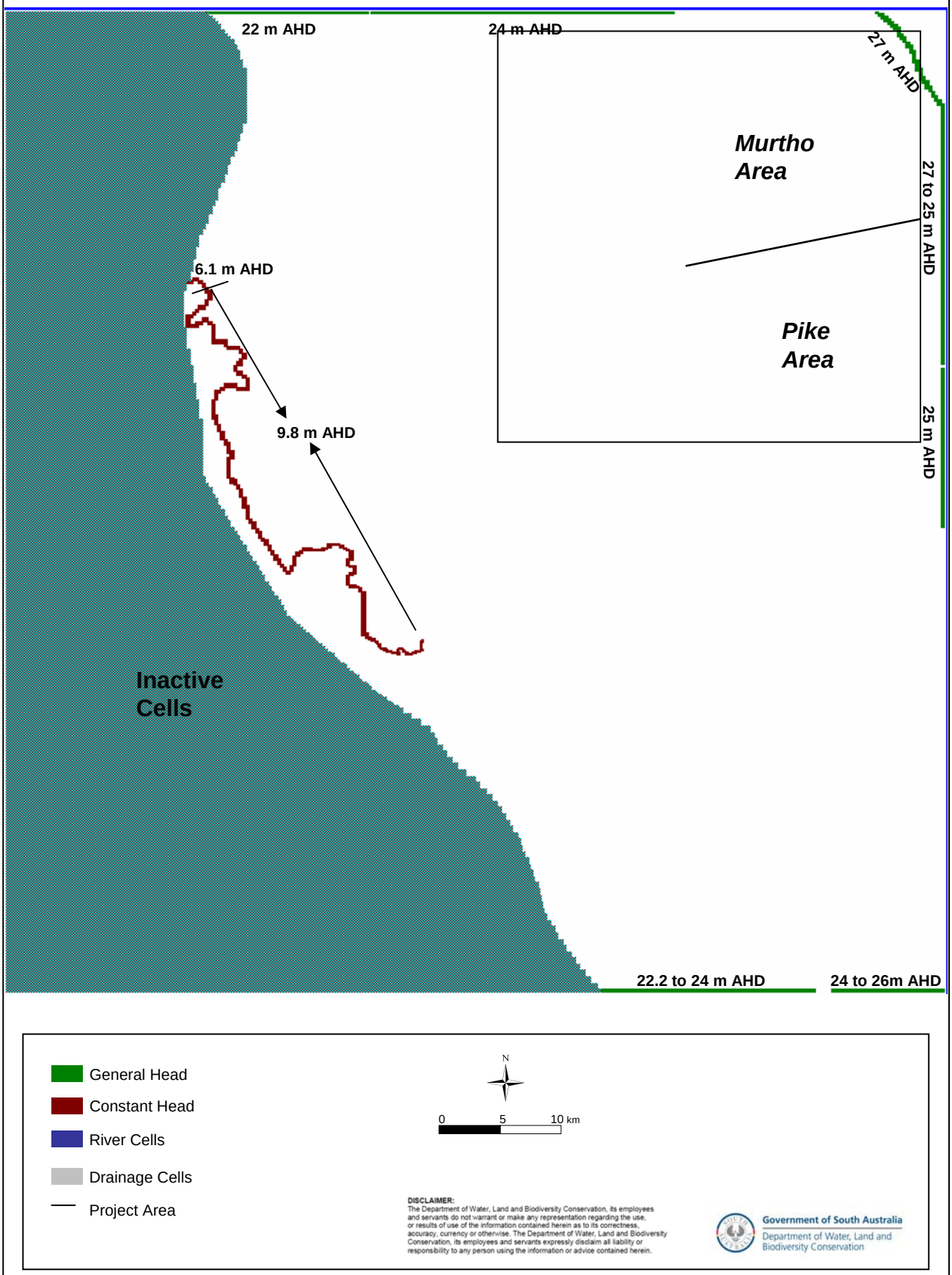


Figure 25: Model boundary conditions (layer 3)

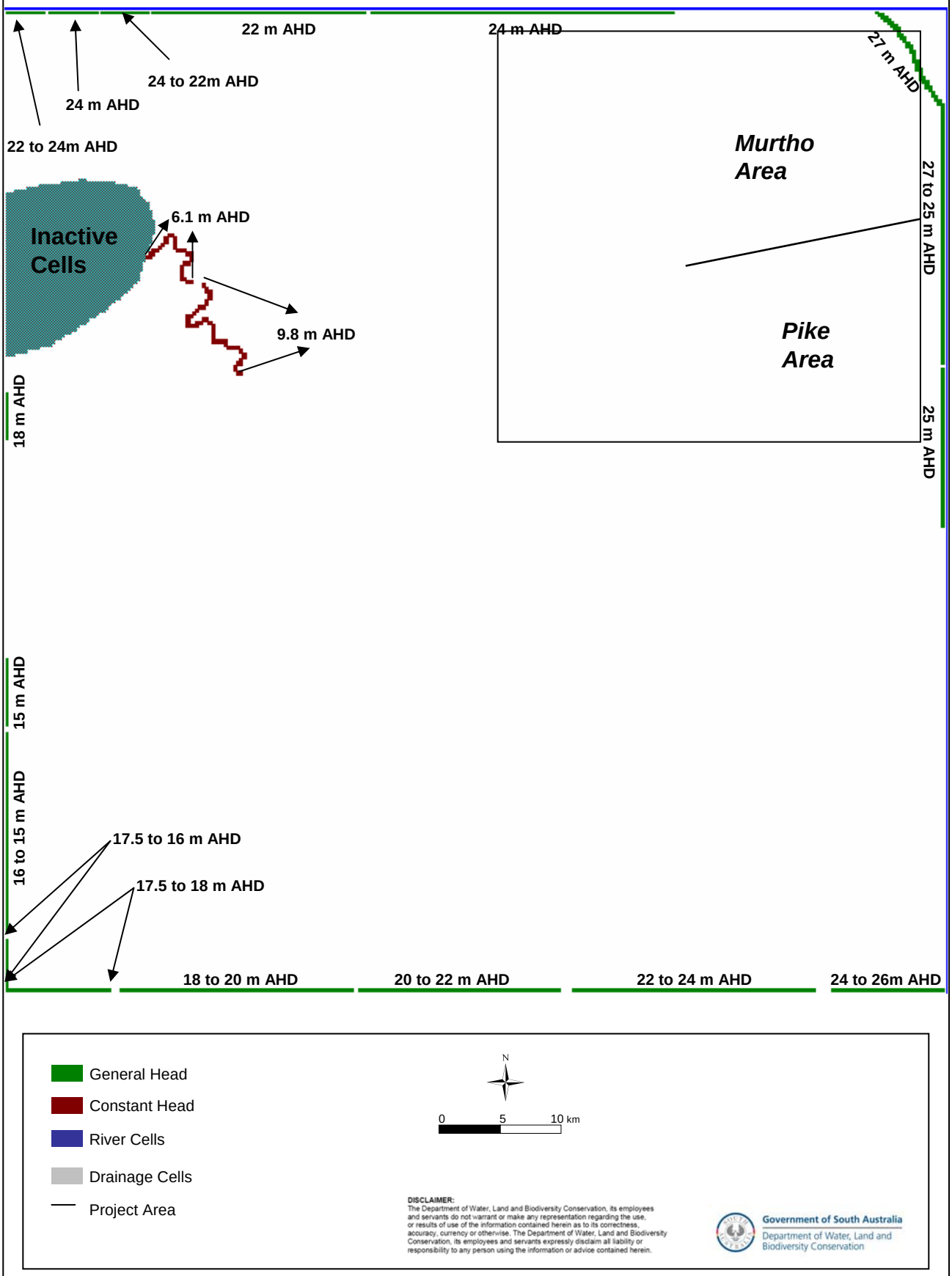


Figure 26: Model boundary conditions (layer 4)

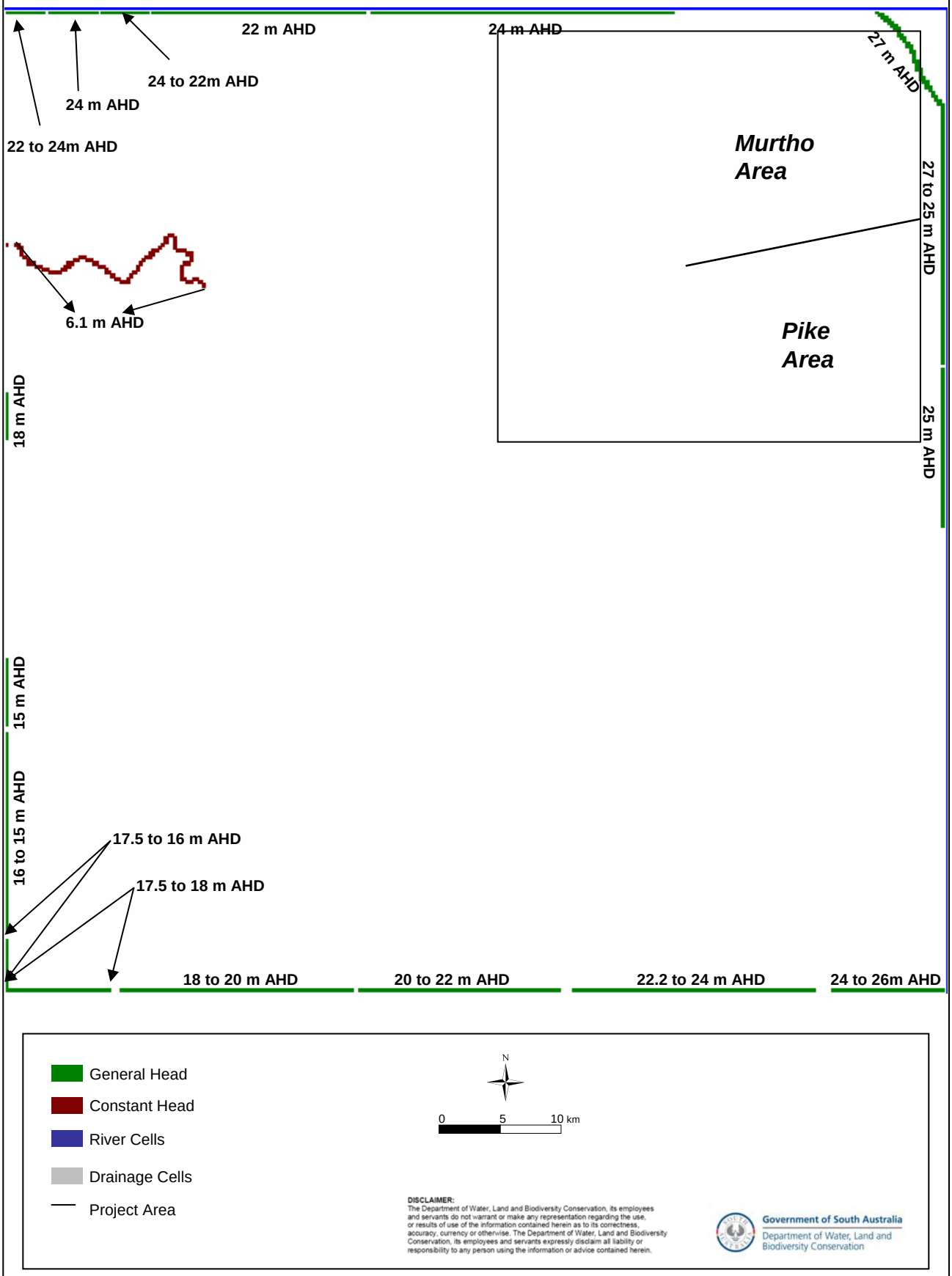


Figure 27: Model boundary conditions (layer 5)

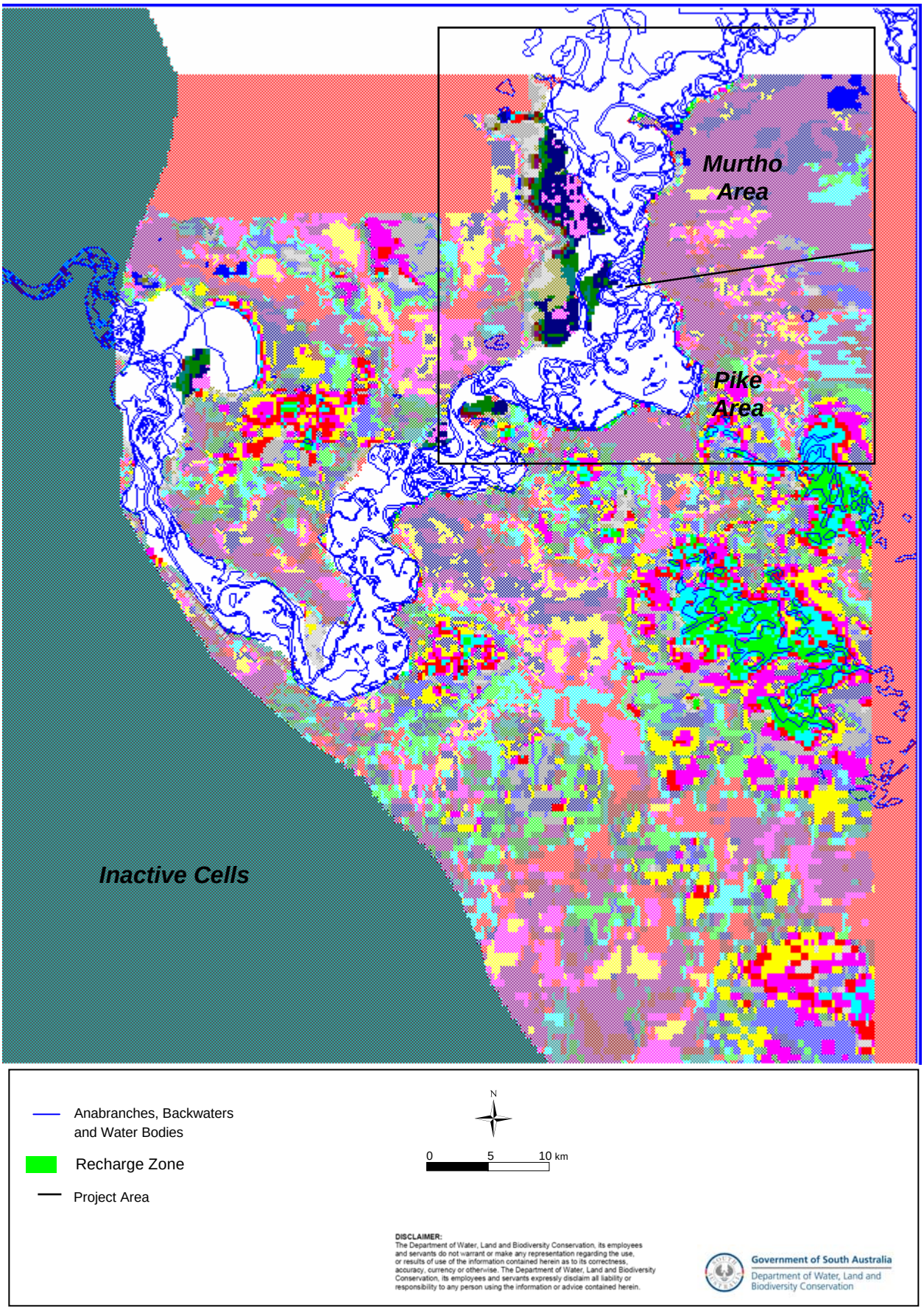


Figure 28: Mallee Clearance recharge zones (41 zones). Recharge rates given in Appendix A-1.

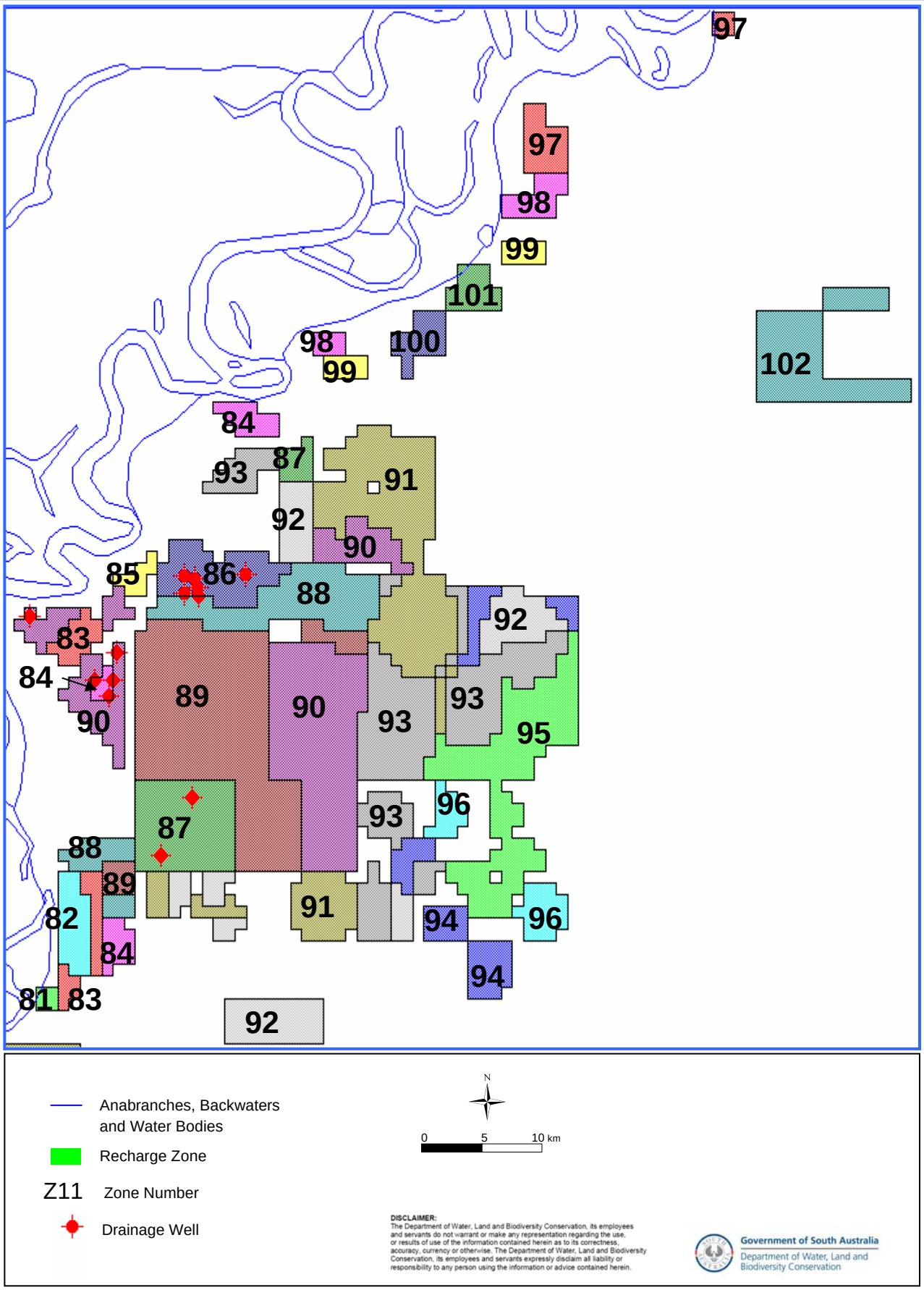


Figure 29: Model recharge zones and drainage wells in North Murtho and Central Murtho areas (recharge rates in each zone against time are listed in Appendix A)

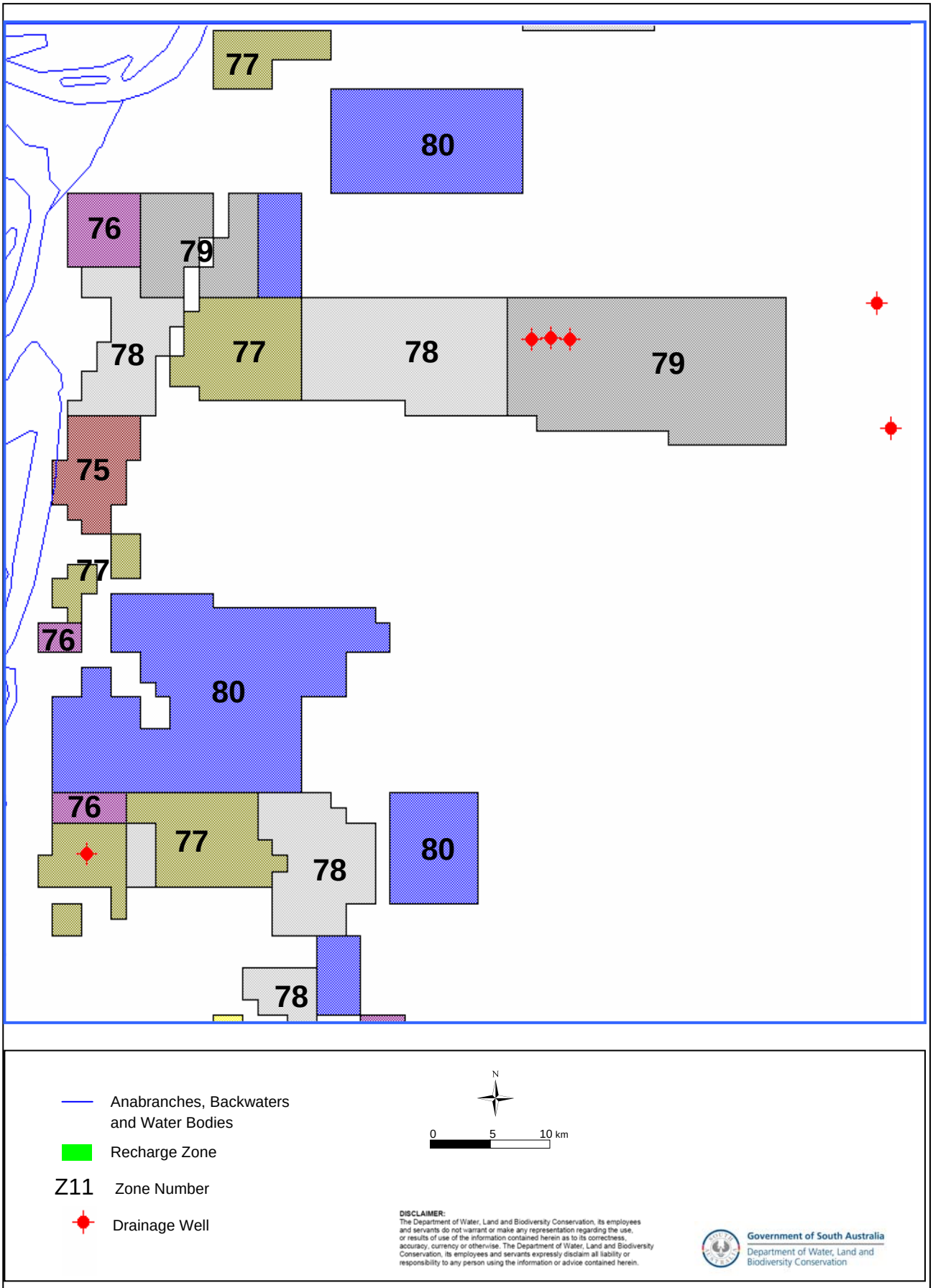


Figure 30: Model recharge zones and drainage wells in South Murtho area (recharge rates in each zone against time are listed in Appendix A)

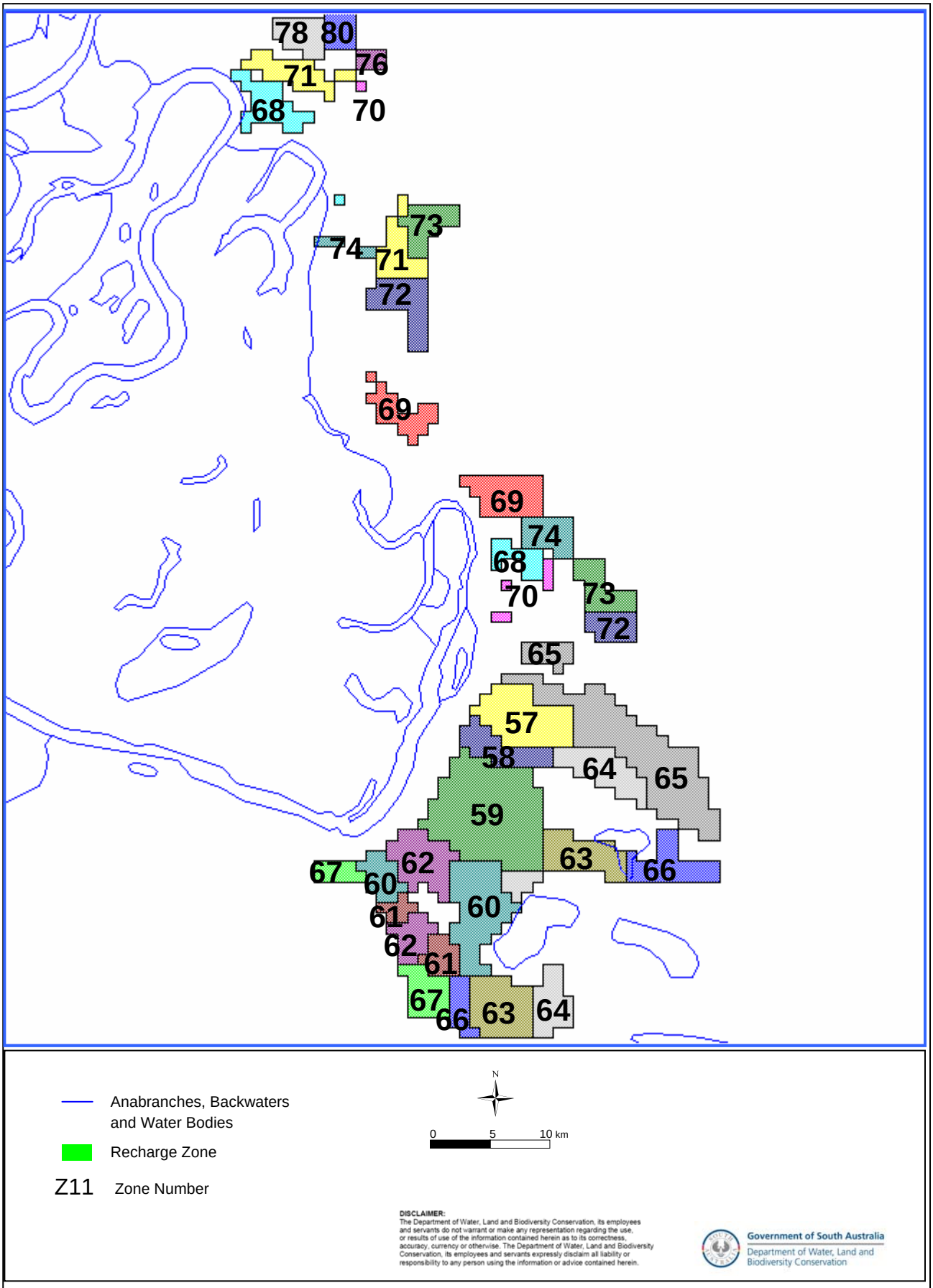


Figure 31: Model recharge zones in Upper Pike and Mid Pike areas (recharge rates in each zone against time are listed in Appendix A)

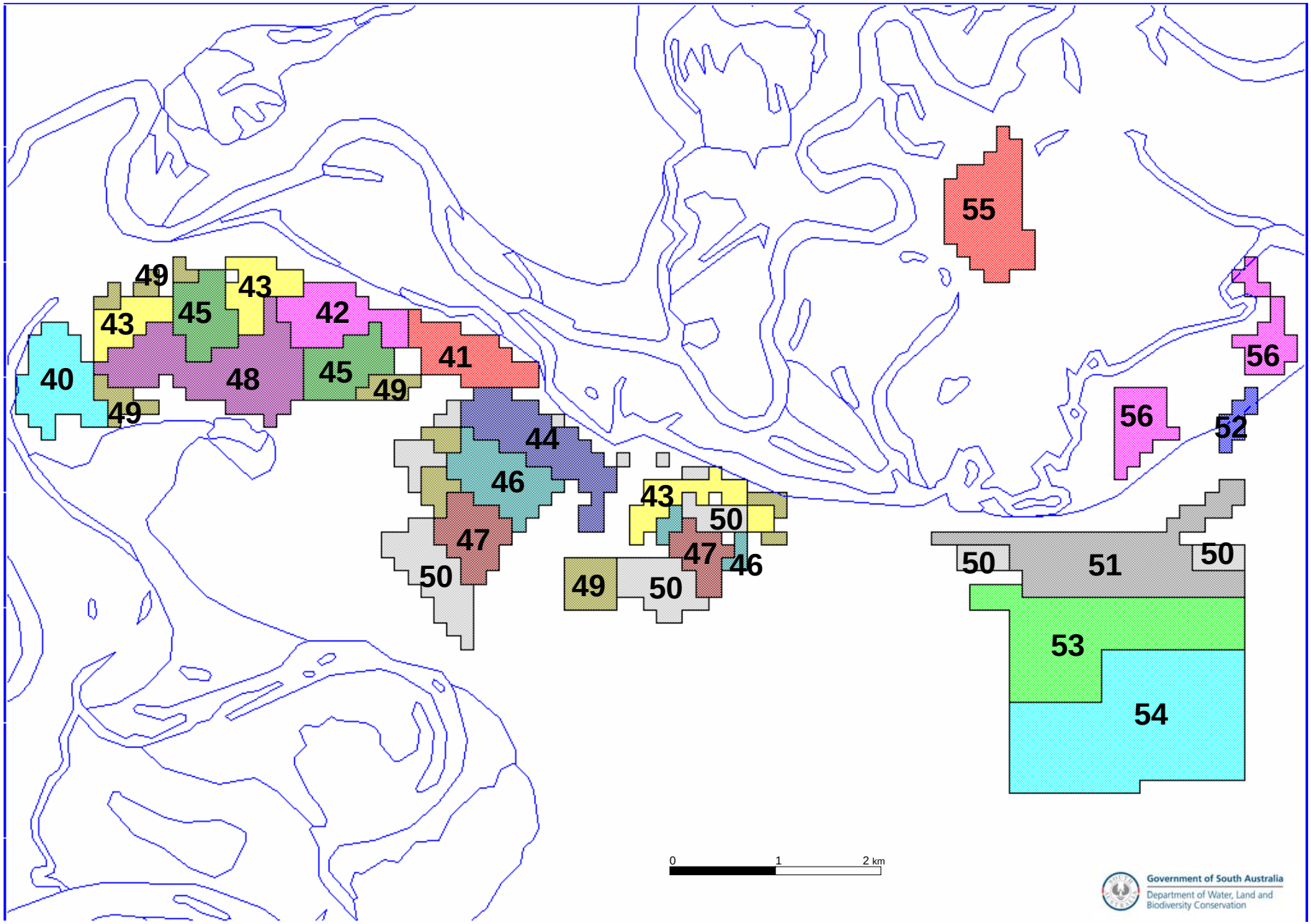


Figure 32: Model recharge zones in Simarloo and Lyrup areas (recharge rates in each zone against time are listed in Appendix A)

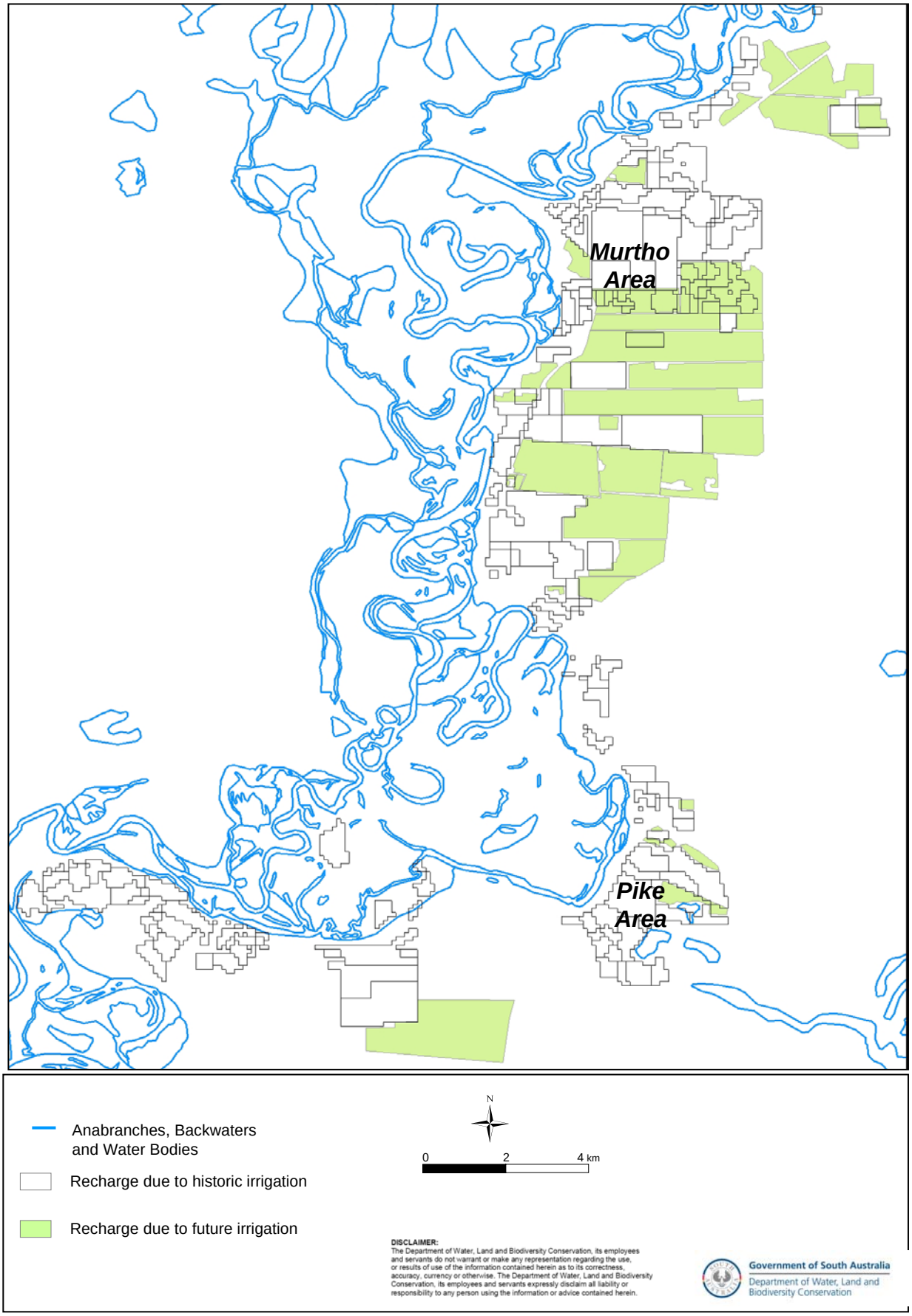


Figure 33: Assumed extent of future irrigation development area (after REM-Aquaterra 2005b) (Recharge rates are 100mm/yr, onset timing in Appendix A)

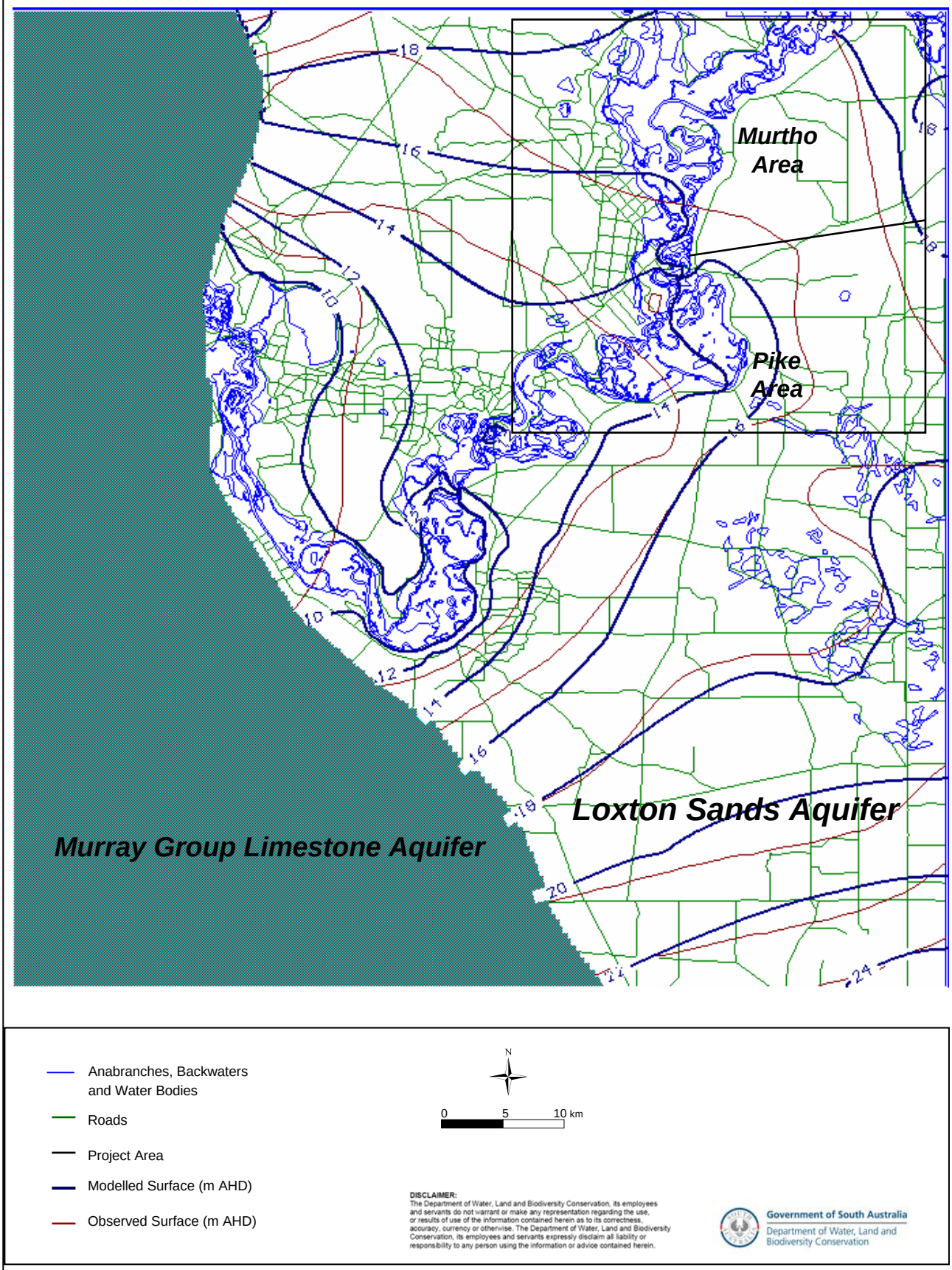


Figure 34: Comparison pre-Irrigation development potentiometric surface (S. Barnett, DWLBC) and modelled post-regulation of the River Murray and pre-irrigation development potentiometric surface, layer 1.

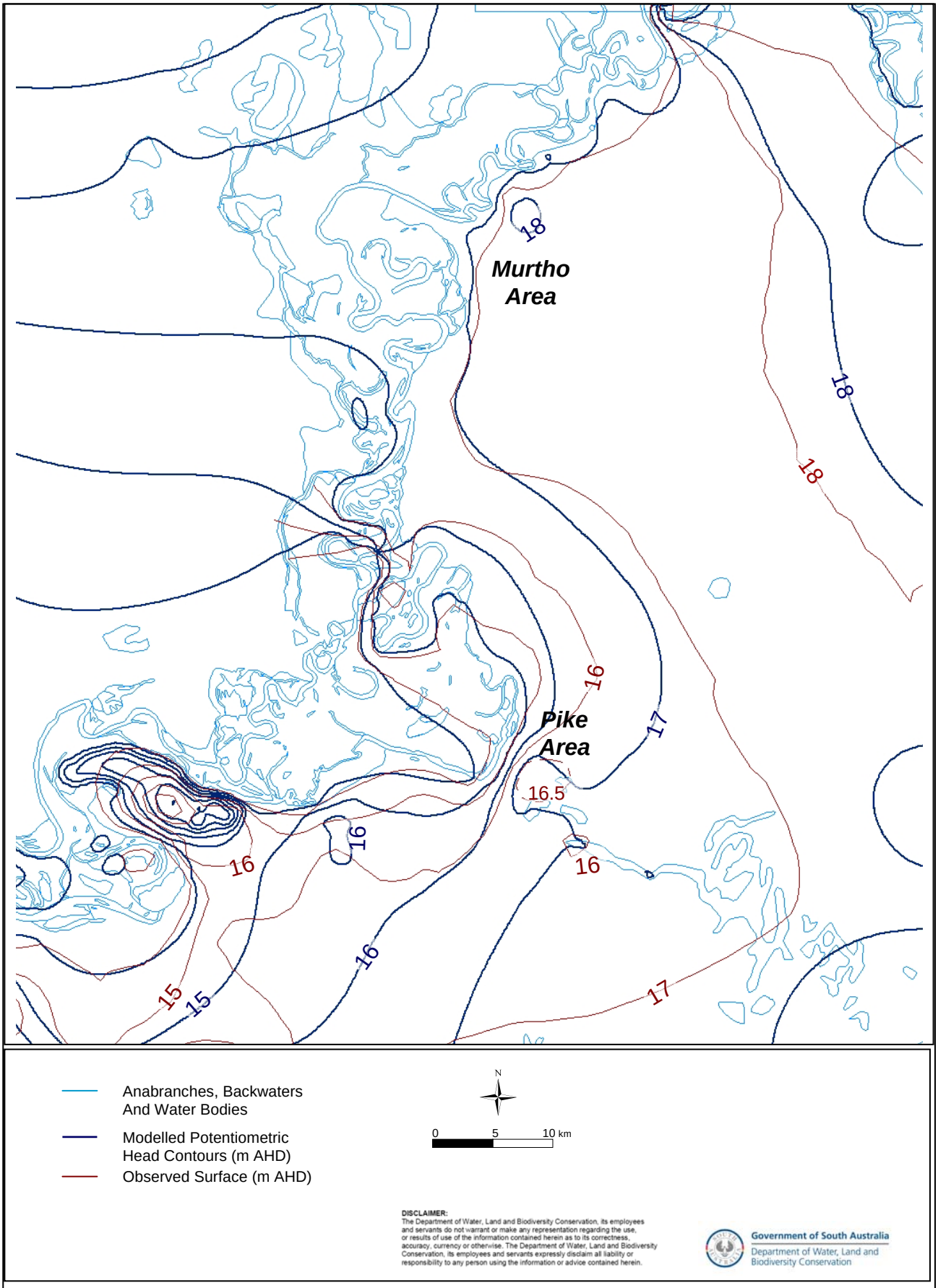
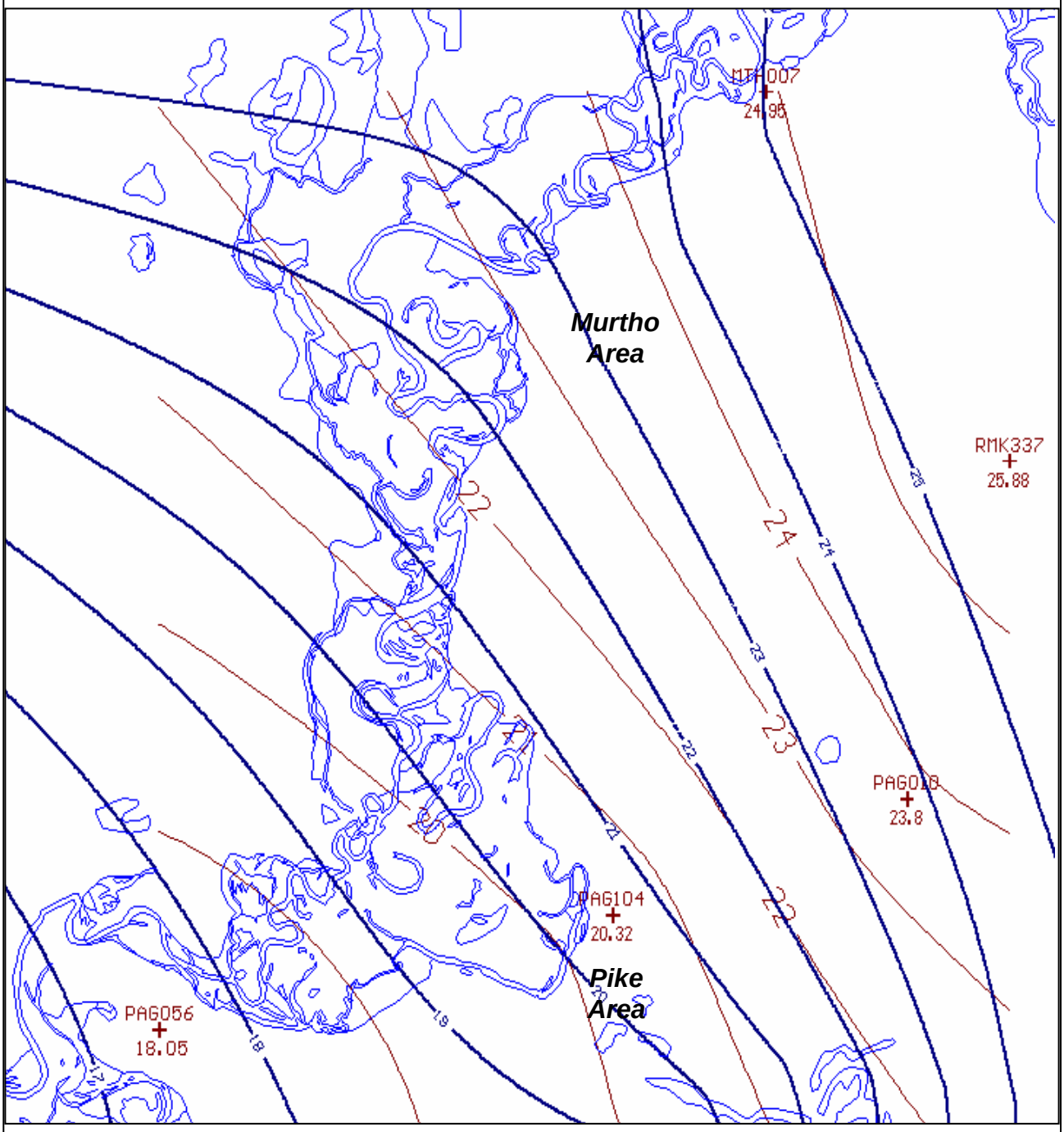


Figure 35: Comparison observed and modelled 2005 potentiometric surface in project area (layer 1 Loxton Sands and Monoman Formation)



Anabranches, Backwaters and Water Bodies

Modelled Potentiometric Head Contours (m AHD)

Observed Surface (m AHD)

RMK337 25.88 Observation Bore

N

0 5 10 km

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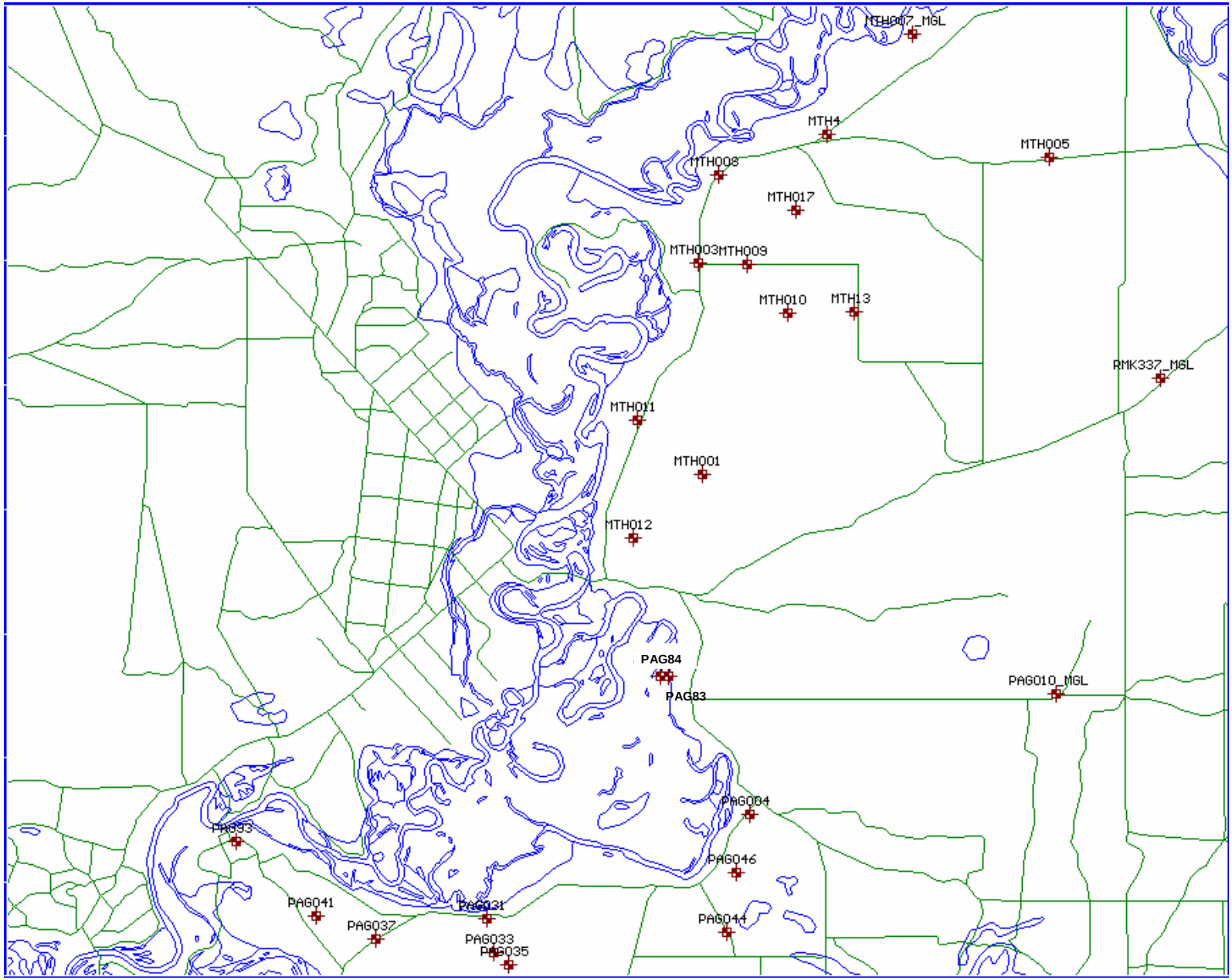
Figure 36: Comparison observed and modelled 2005 potentiometric surface in project area (layer 5 Mannum Formation)



Anabranches, Backwaters and Water Bodies

Roads

Observation Wells

N

0 1 2km

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Figure 37: Location of monitored observation wells in the Pike - Murtho project area.

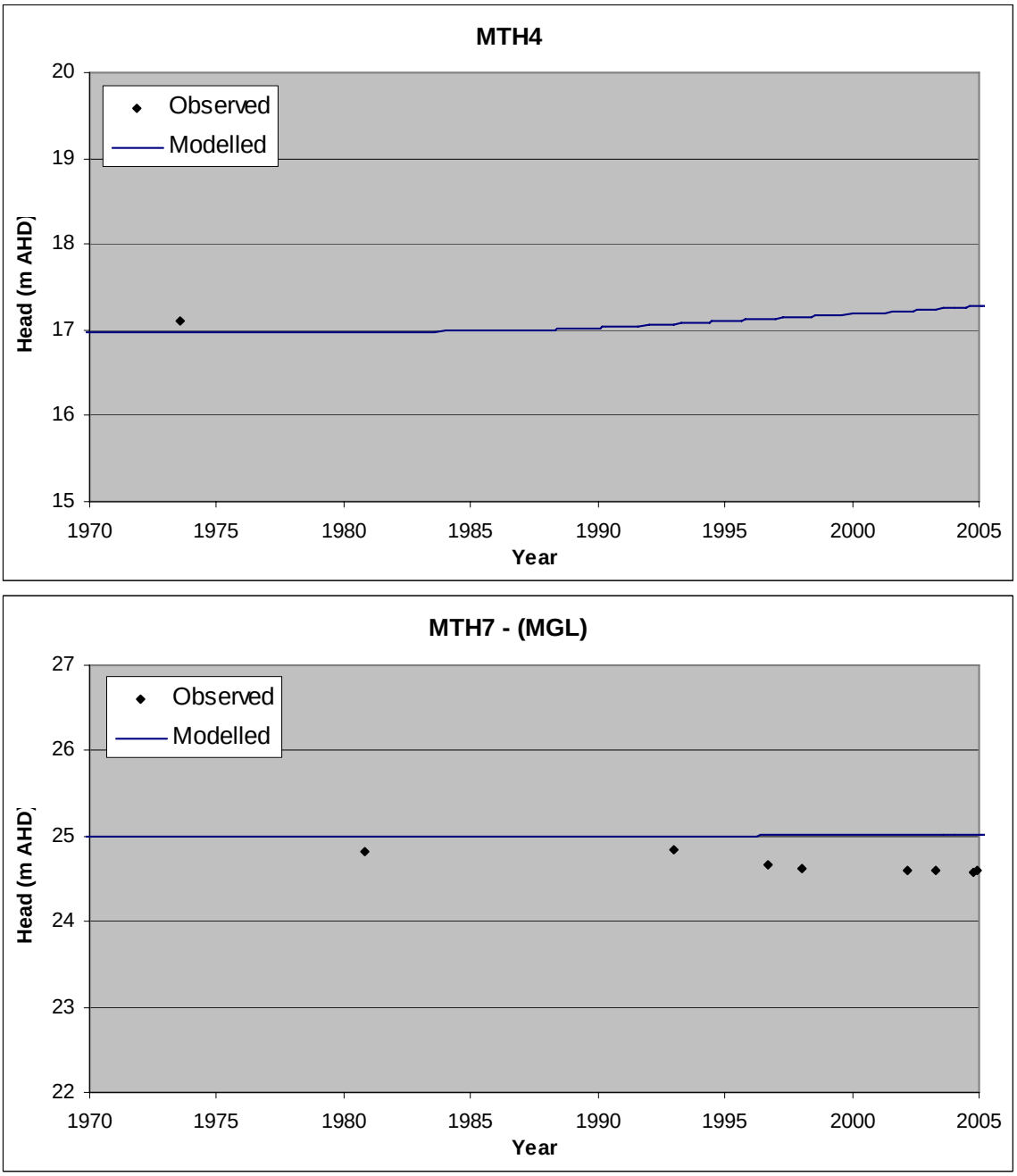


Figure 38. North Murtho calibration results – Modelled and observed potentiometric heads (Observation wells MTH004, MTH007).

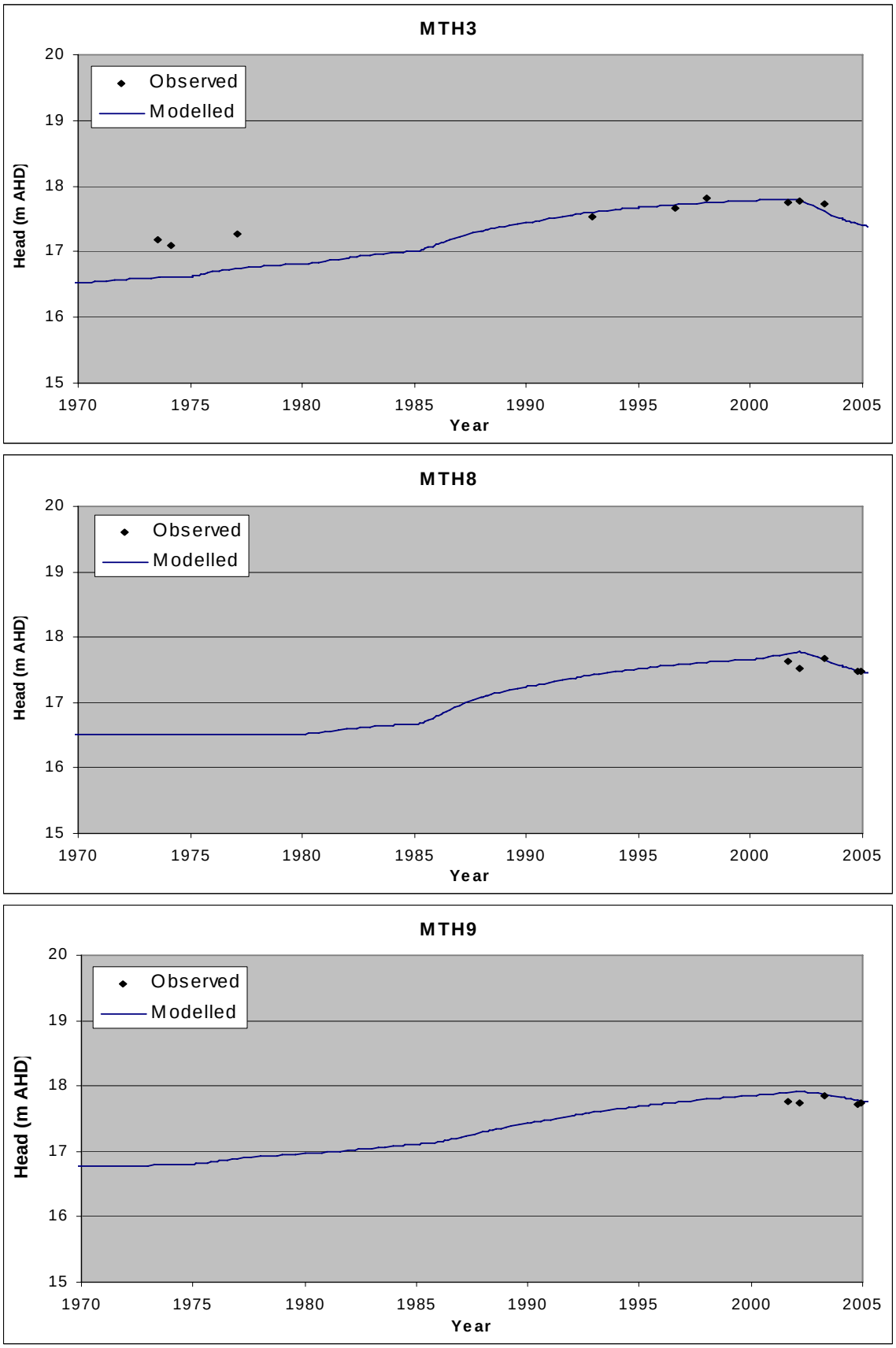


Figure 39. Central Murtho calibration results – Modelled and observed potentiometric heads (Observation wells MTH003, MTH008, MTH009)

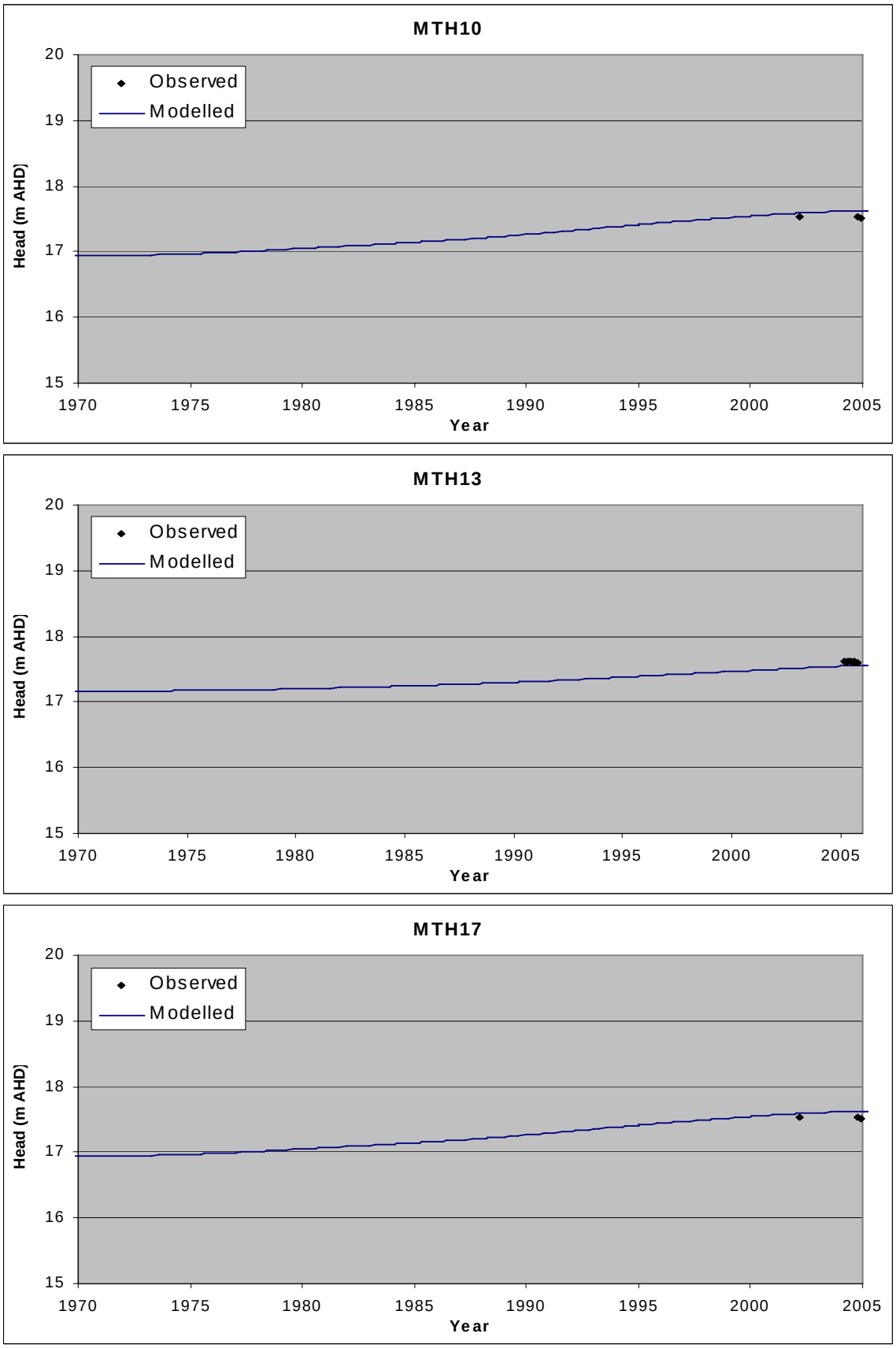


Figure 40. Central Murtho calibration results – Modelled and observed potentiometric heads (Observation wells MTH010, MTH013, MTH017)

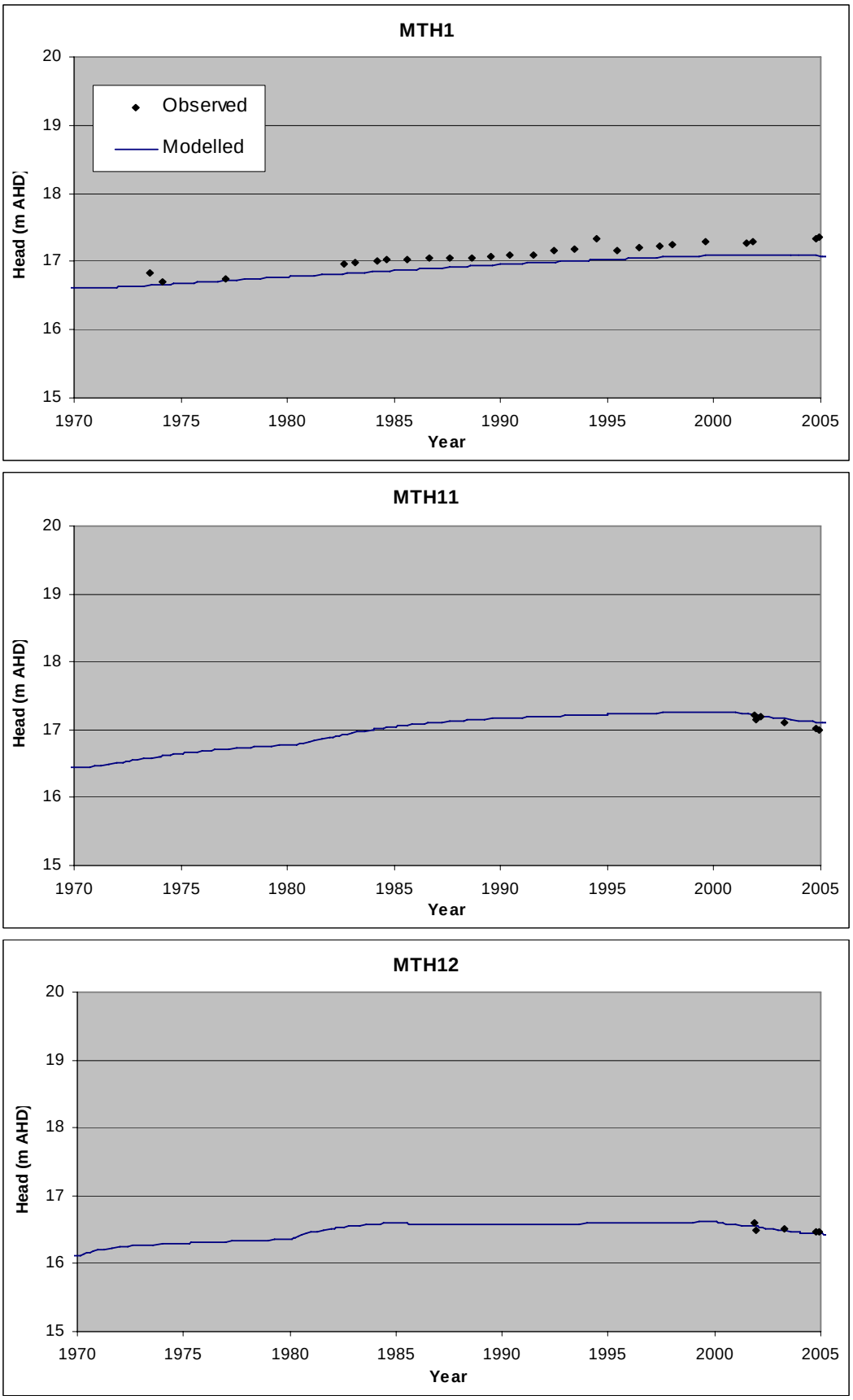
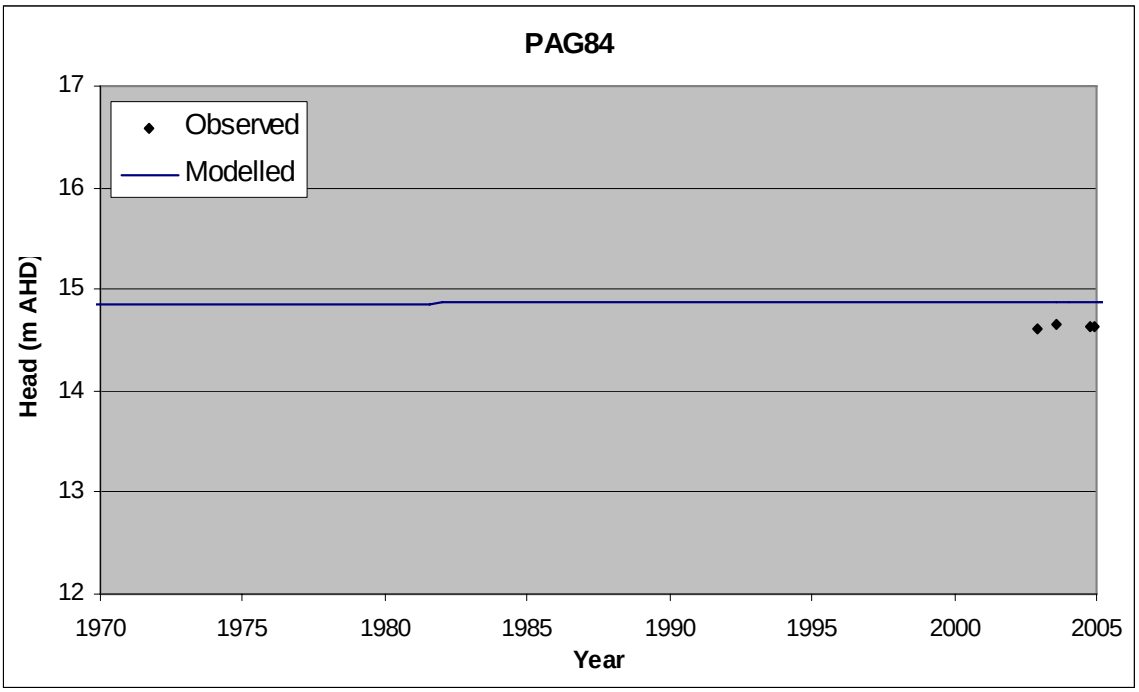


Figure 41. South Murtho calibration results – Modelled and observed potentiometric heads (Observation wells MTH001, MTH011, MTH012)



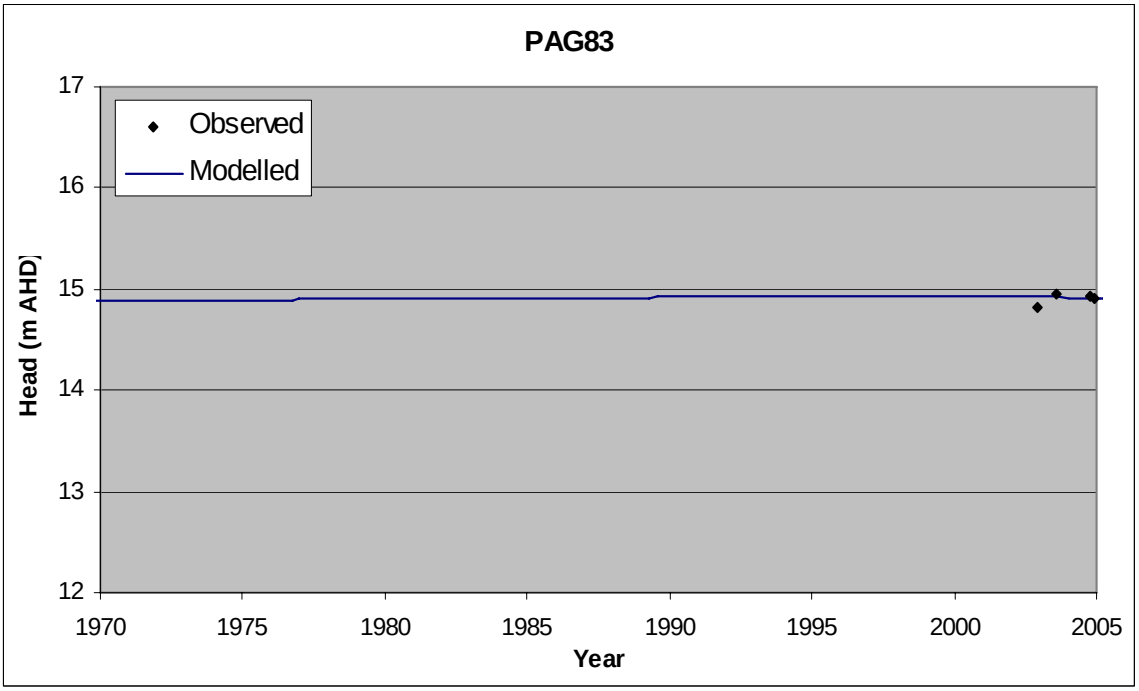


Figure 42. Upper Pike calibration results – Modelled and observed potentiometric heads (Observation wells PAG084, PAG083)

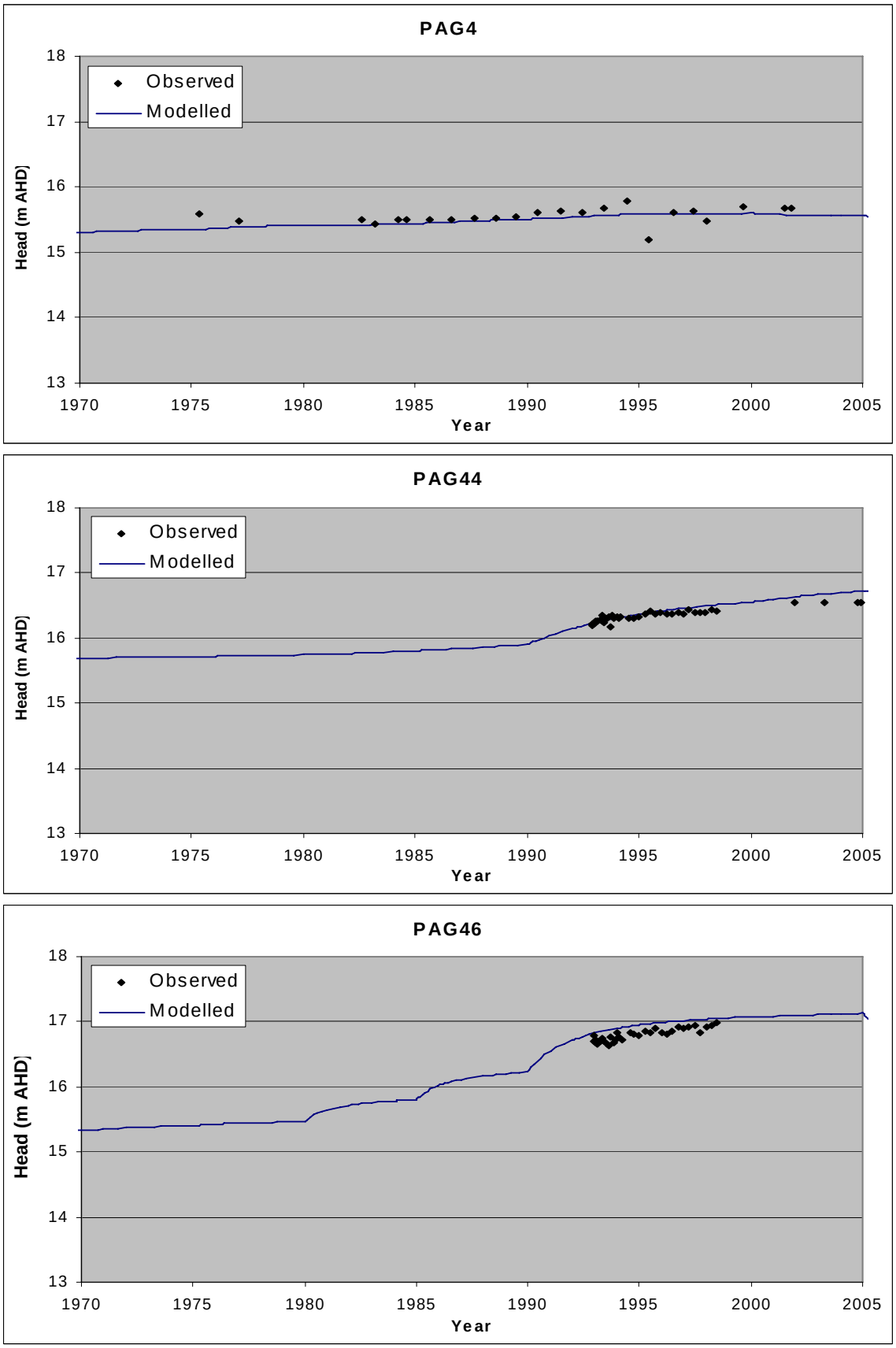


Figure 43. Mid Pike calibration results – Modelled and observed potentiometric heads (Observation wells PAG004, PAG044, PAG046)

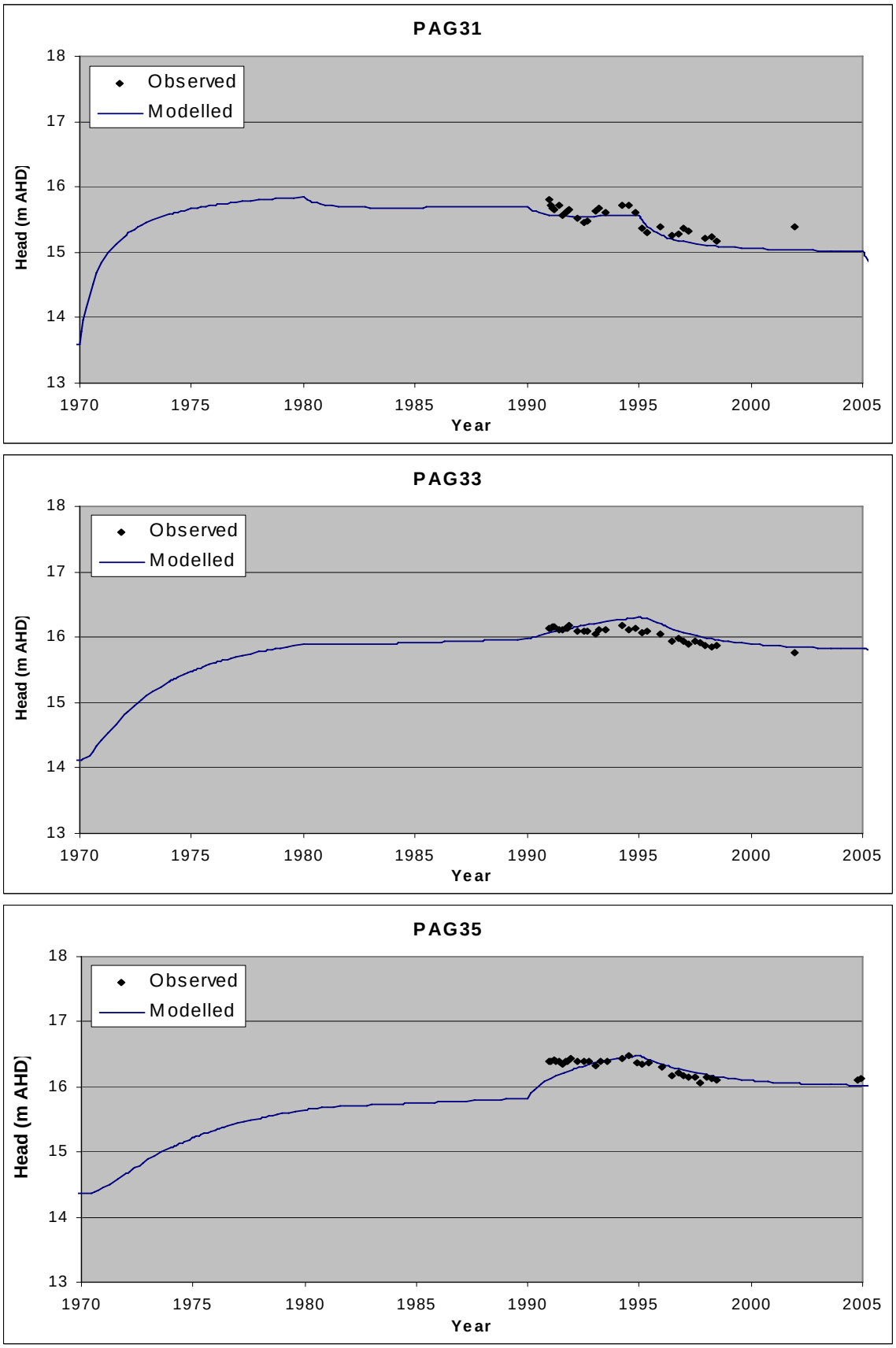


Figure 44. Simarloo calibration results – Modelled and observed potentiometric head (Observation wells PAG031, PAG033, PAG035)

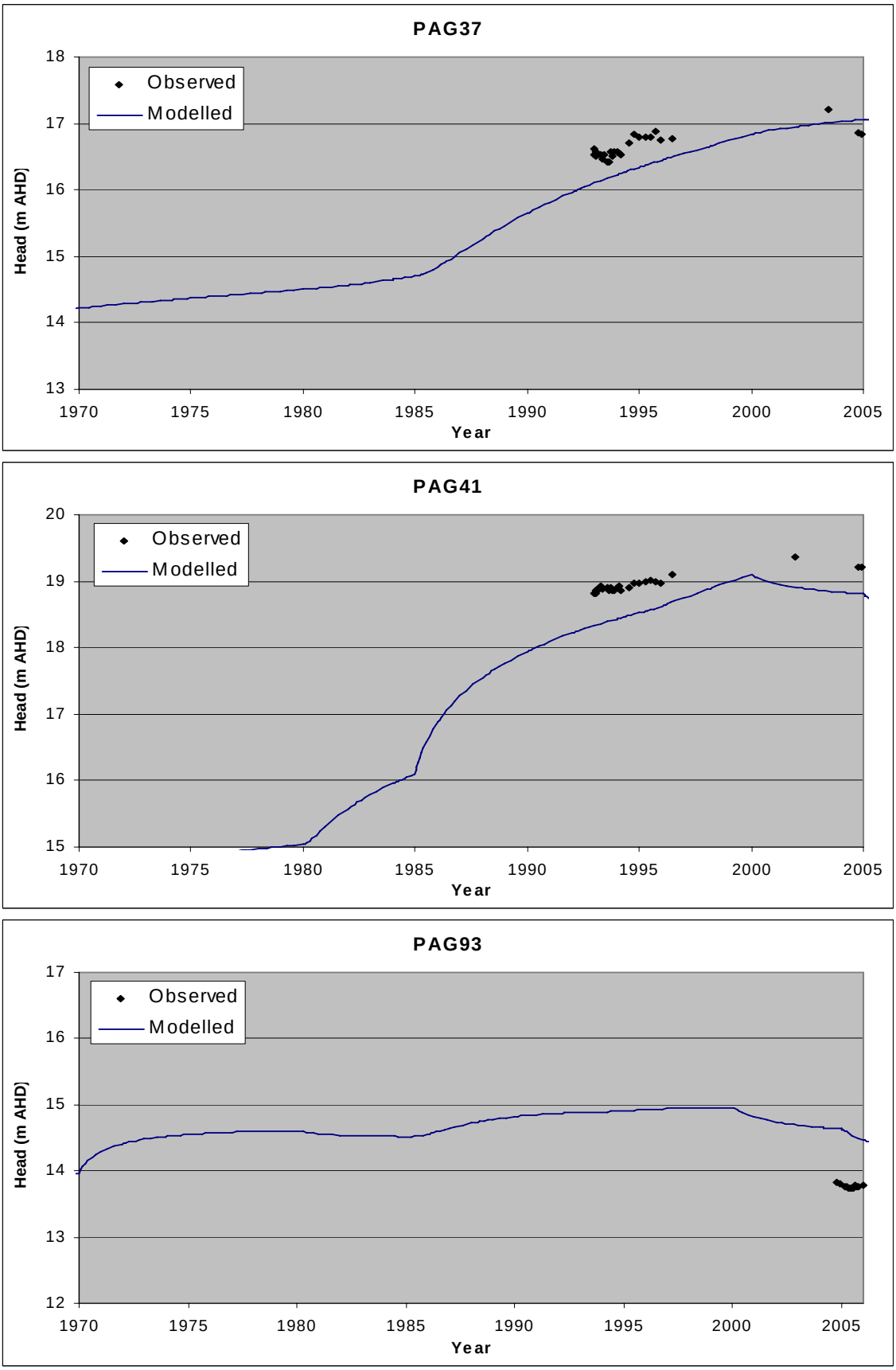


Figure 45. Lyrup calibration results – Modelled and observed potentiometric heads (Observation wells PAG037, PAG041, PAG093)

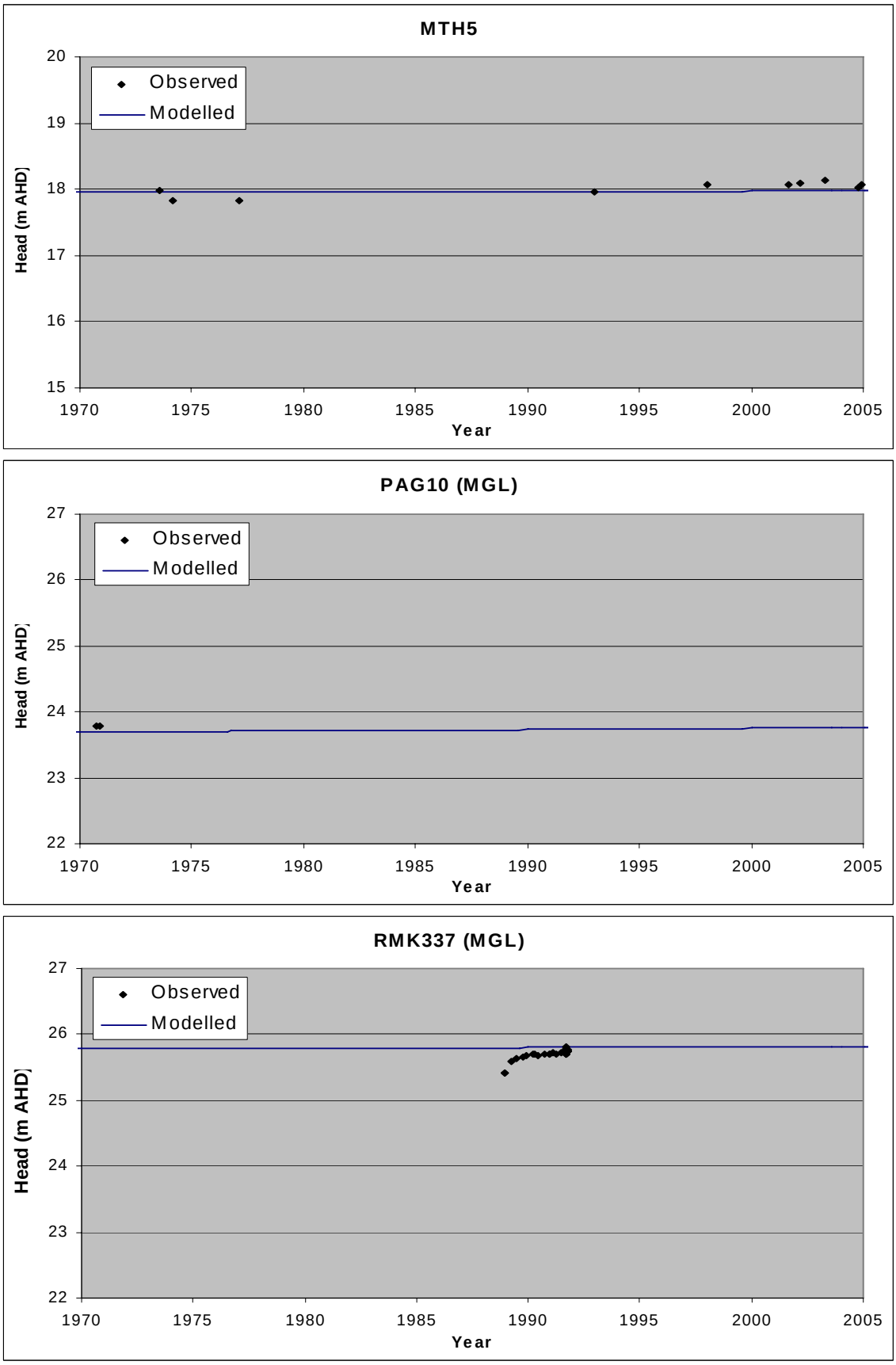
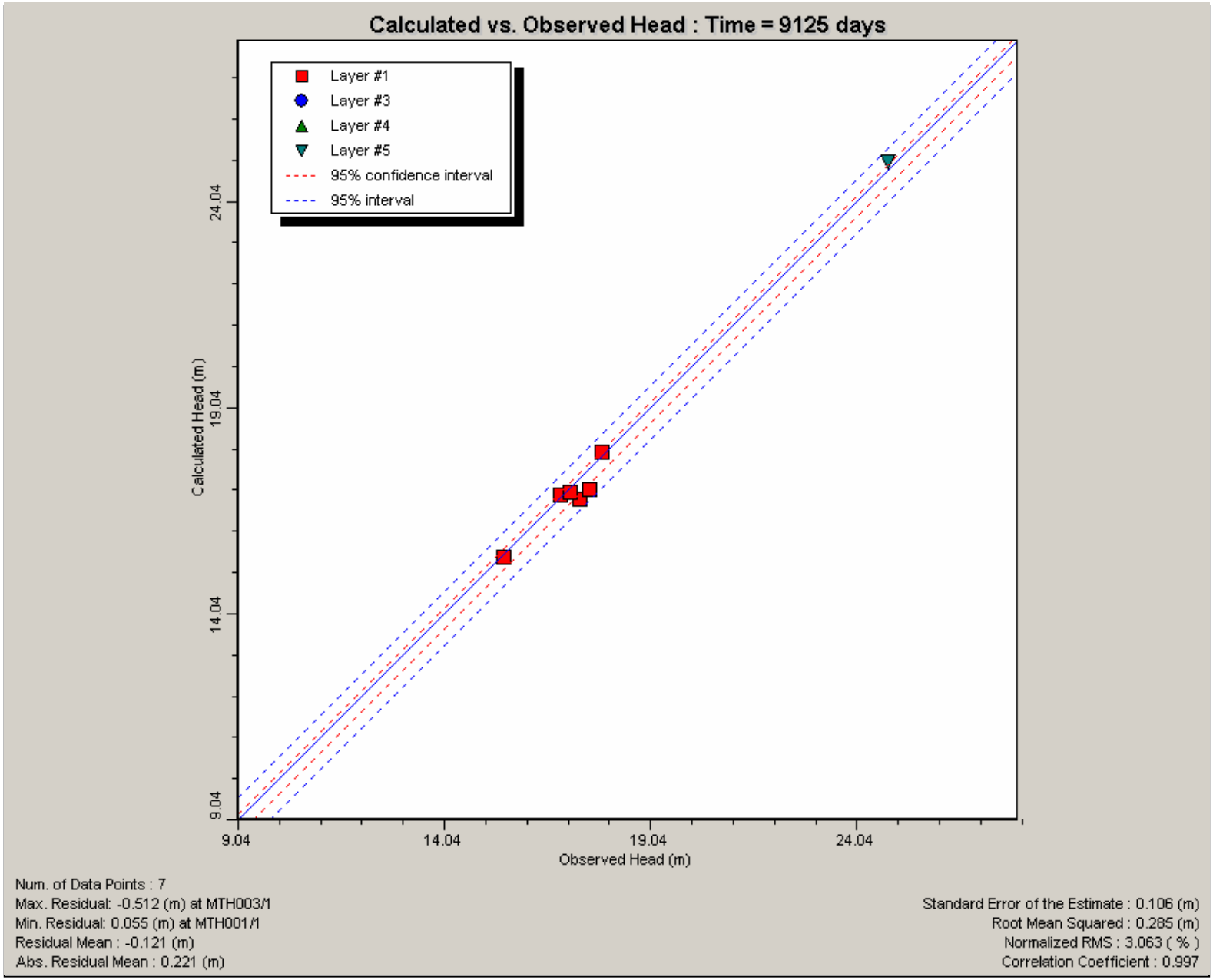


Figure 46. Dryland calibration results – Modelled and observed potentiometric heads (Observation wells MTH005, PAG010, RMK337)



Included OBSwells
Pag 4
Mth 1
Mth 3
Mth 4
Mth 7 (MGL)
Mth 5
Mth 10

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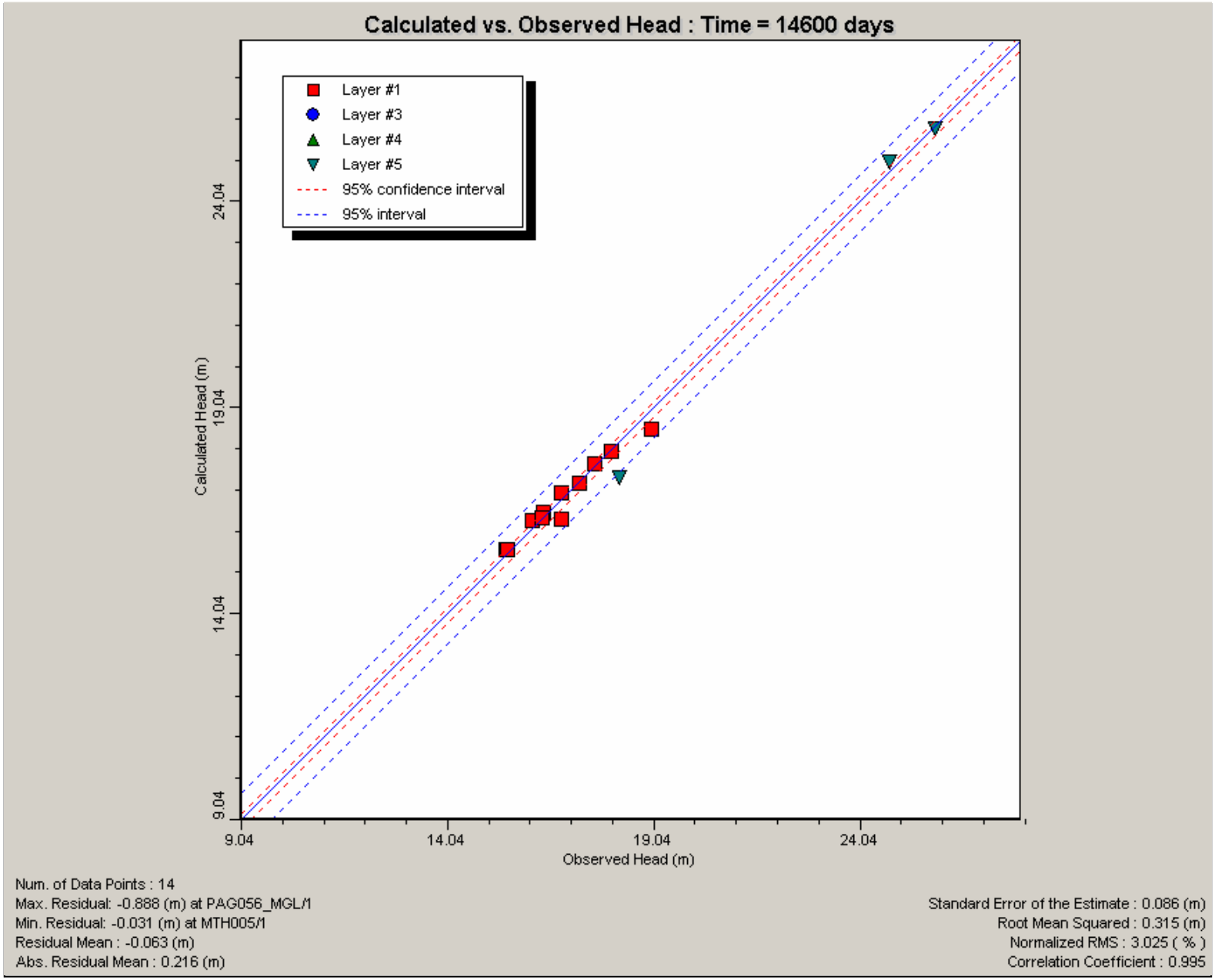
Figure 47: Pike Murtho area calibration results (1980)



Included OBSwells
Pag 37
Pag 41
Pag 56 (MGL)
Pag 31
Pag 33
Pag 35
Pag 44
Pag 4
Pag 46
Mth 1
Mth 3
Mth 7 (MGL)
Mth 5
Rmk 337

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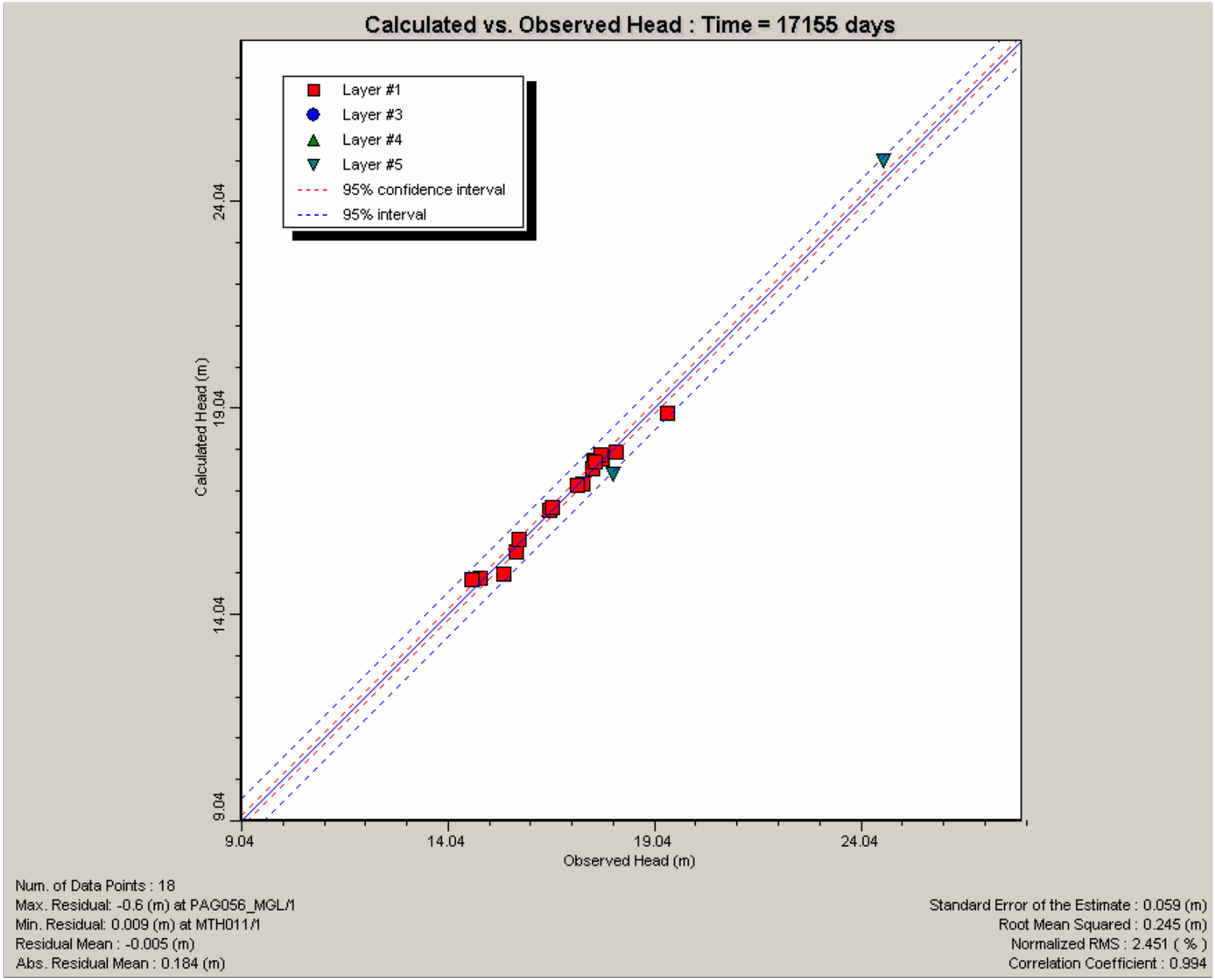
Figure 48: Pike Murtho area calibration results (1995)



Included OBSwells
Pag 83
Pag 84
Pag 56 (MGL)
Pag 31
Pag 33
Pag 4
Pag 44
Pag 41
Mth 1
Mth 11
Mth 12
Mth 3
Mth 8
Mth 9
Mth 10
Mth 17
Mth 7 (MGL)
Mth 5

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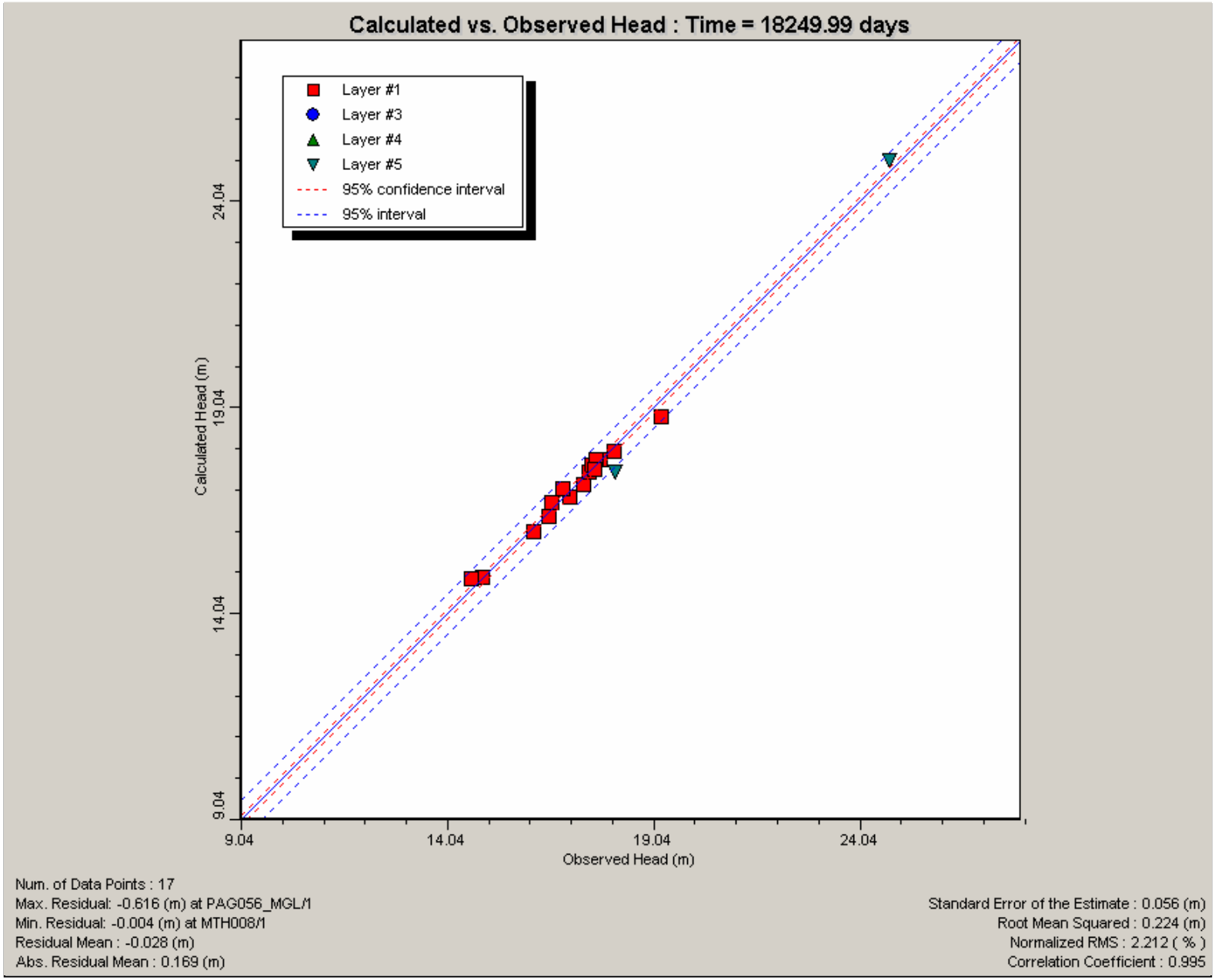
Figure 49: Pike Murtho area calibration results (2002)



Included OBSwells
Pag 83
Pag 84
Pag 37
Pag 41
Pag 56 (MGL)
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Pag 44
Mth 1
Mth 11
Mth 12
Mth 8
Mth 9
Mth 10
Mth 13
Mth 17
Mth 7 (MGL)
Mth 5

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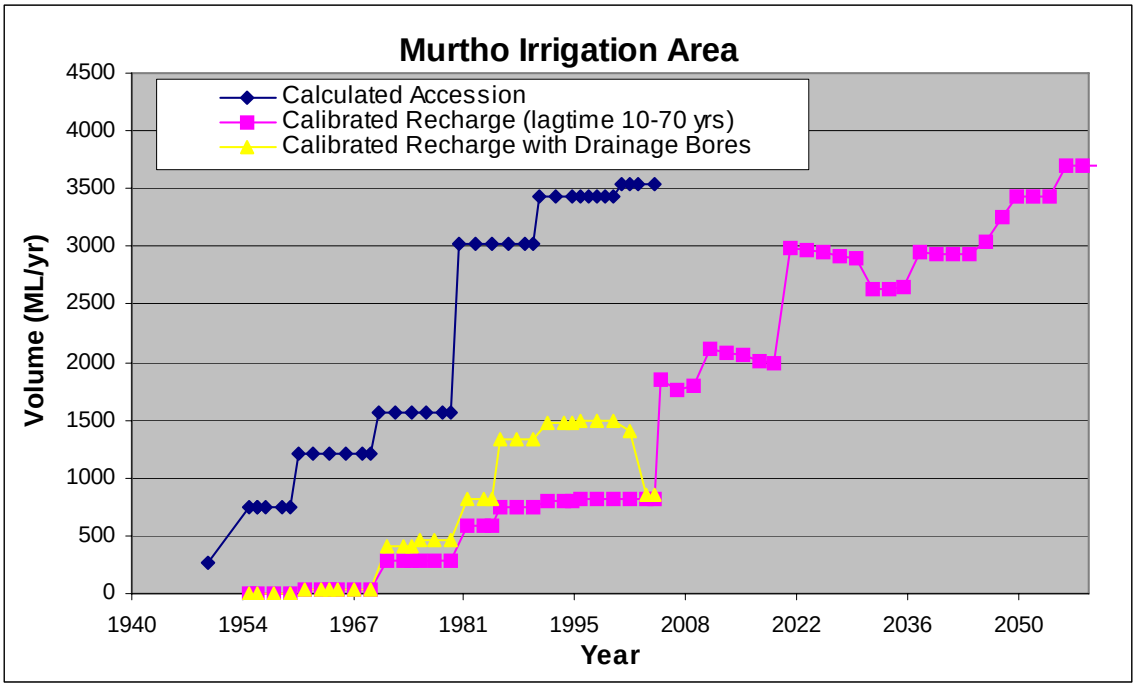
Figure 50: Pike Murtho area calibration results (2005)



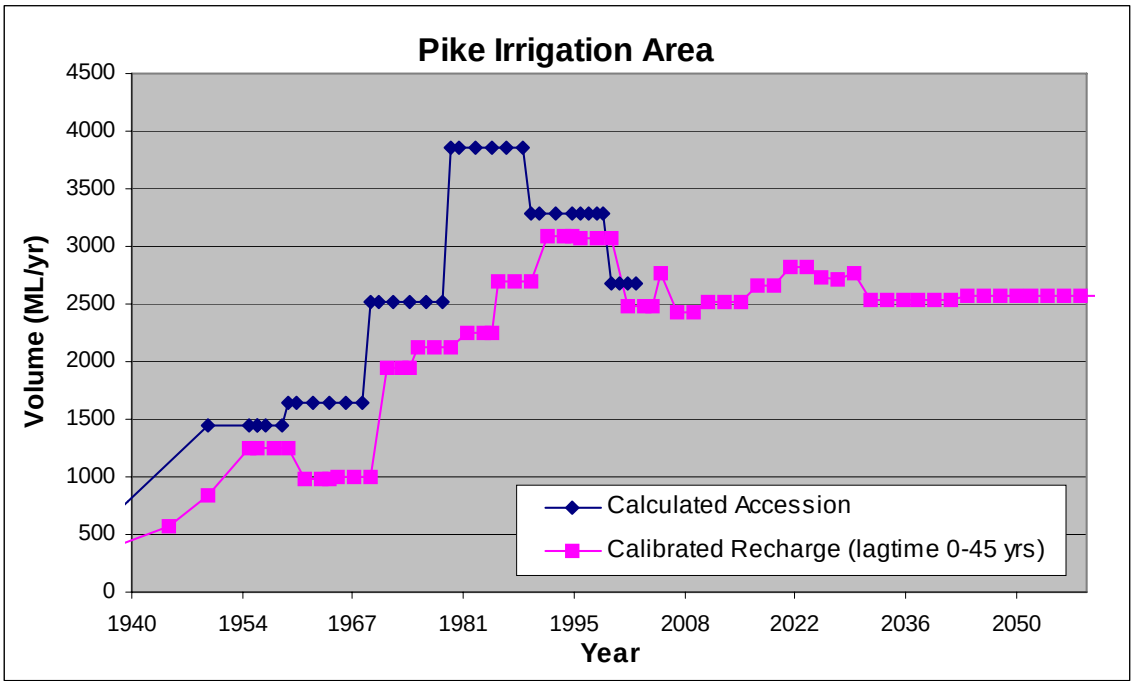
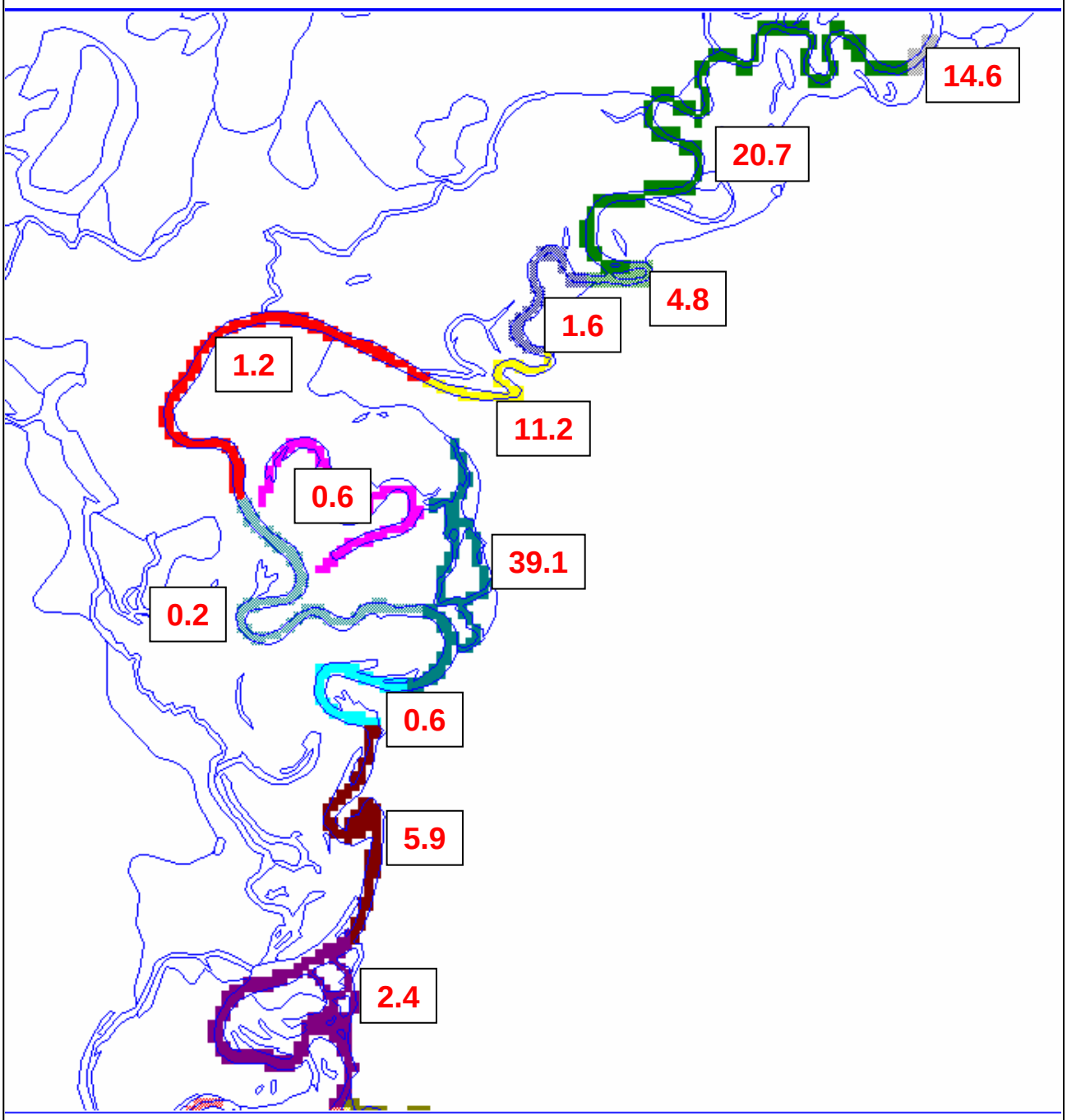


Figure 51. Comparison of modelled (calibrated) total recharge volume vs calculated accession (REM-Aquaterra, 2005b) based on 15% RZD of application



Anabranches, Backwaters and Water Bodies

Budget Zone

12.3 Salt load (tonnes/day)

N

0 5 10 km

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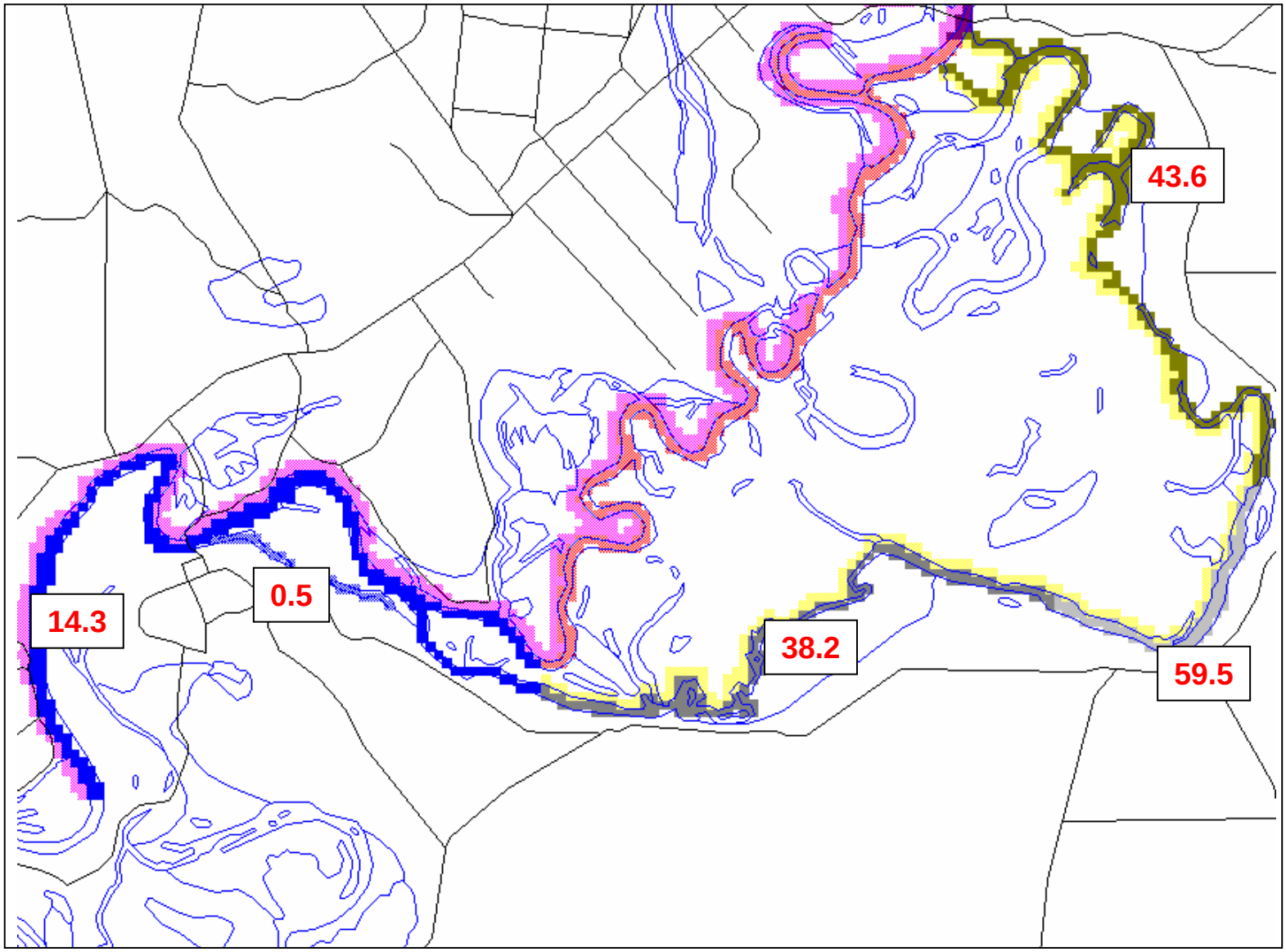
Figure 52: Model flow budget zones and modelled salt load at 2005 (tonnes/day) in Murtho Area



Anabranches, Backwaters and Water Bodies

Budget zones

12.3 Salt load (tonnes/day)

N

0 1 2 km

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Figure 53: Model flow budget zones and modelled salt load at 2005 (tonnes/day) in Pike Area

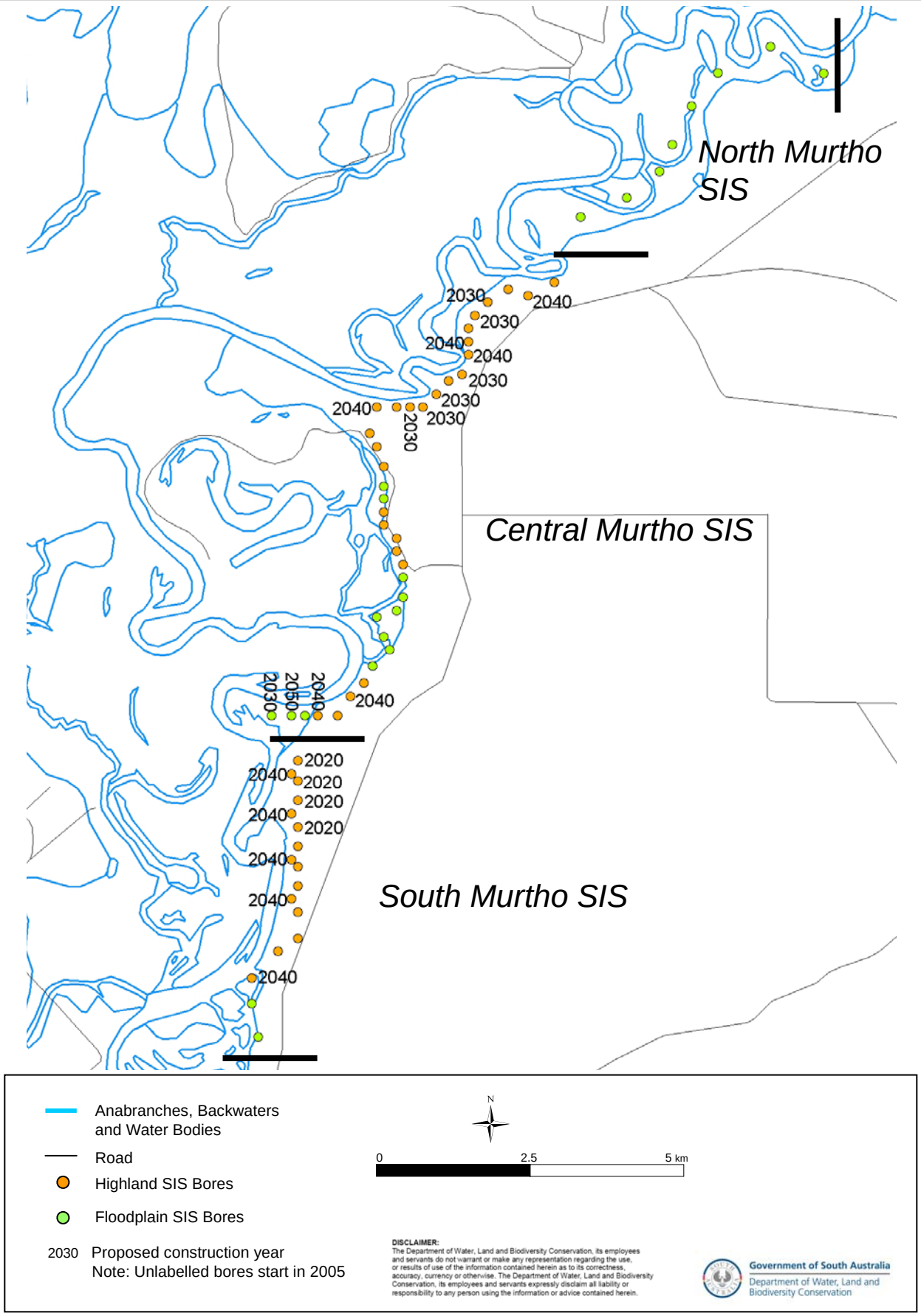


Figure 54: Concept SIS wellfield in the Murtho Area (Scenario-6)

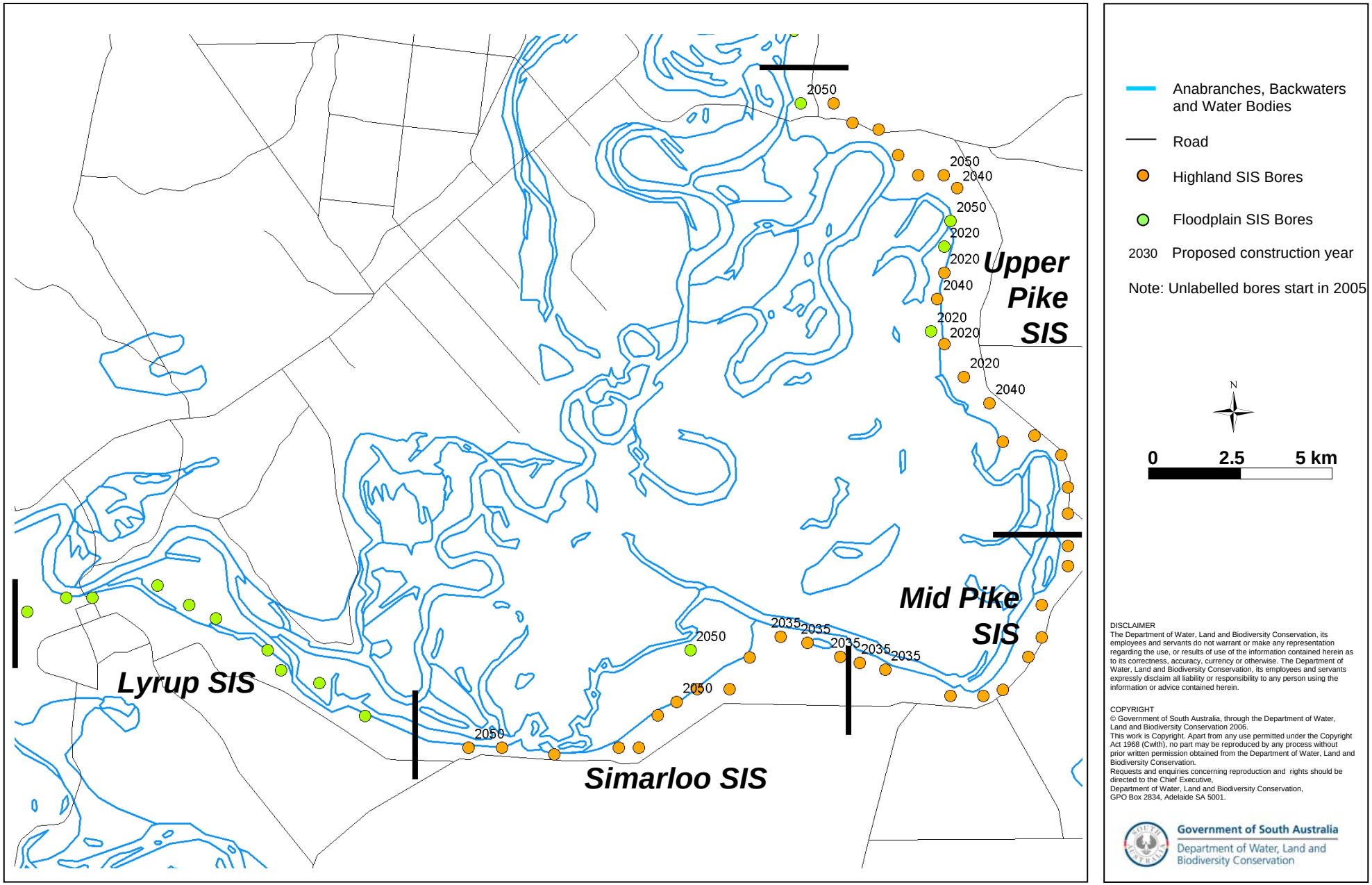


Figure 55: Concept SIS wellfield in the Pike Area (Scenario-6)

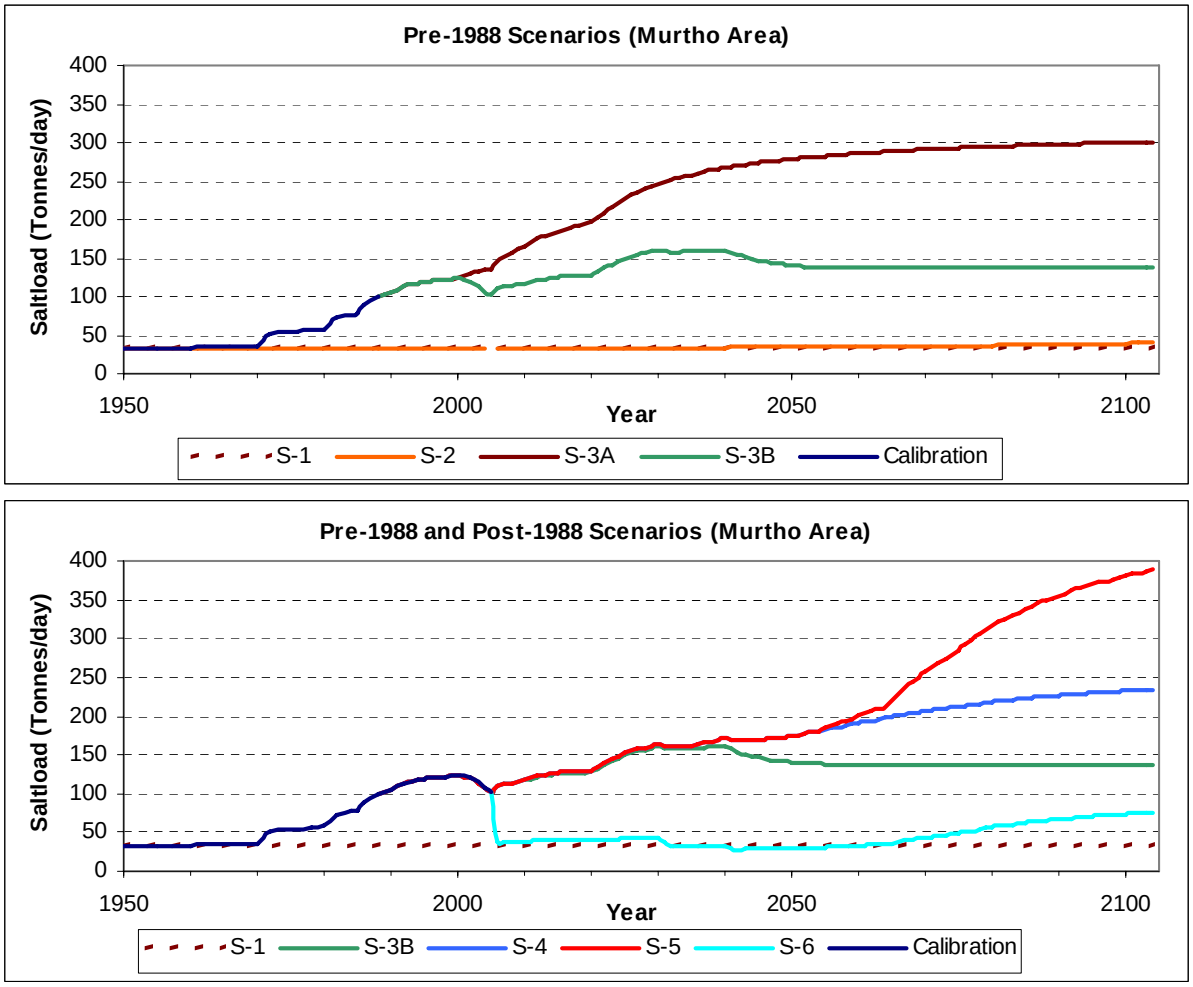
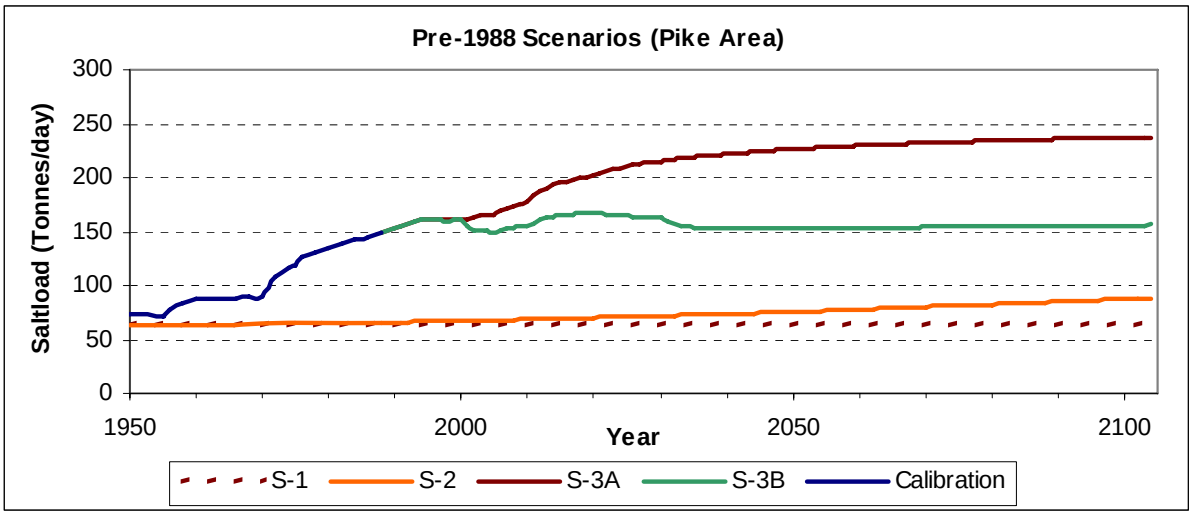


Figure 56. Predicted salt loads entering the River Murray all scenarios (Murtho Area)



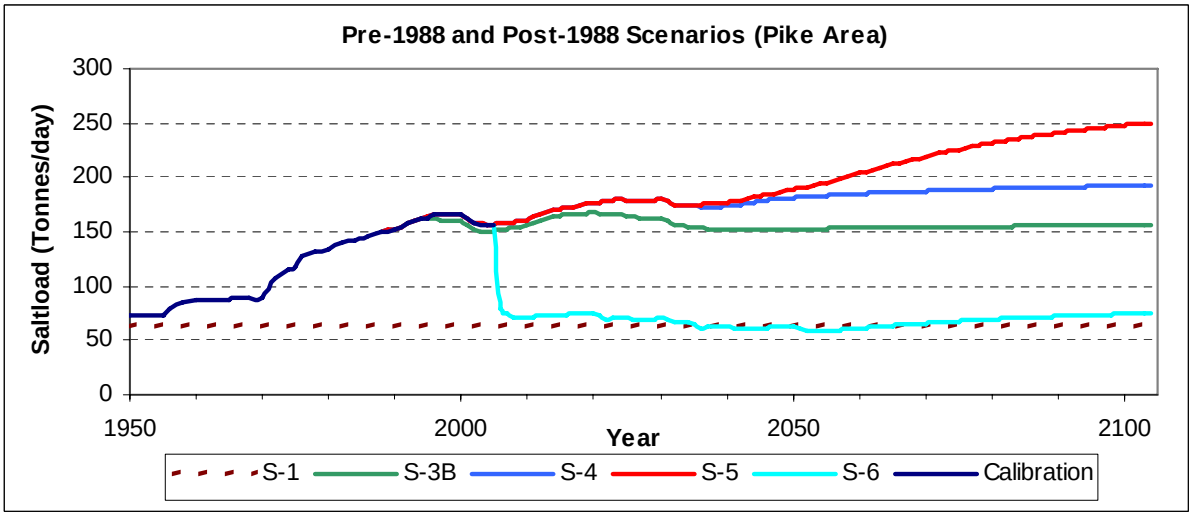


Figure 57. Predicted salt loads entering the River Murray all scenarios (Pike Area)

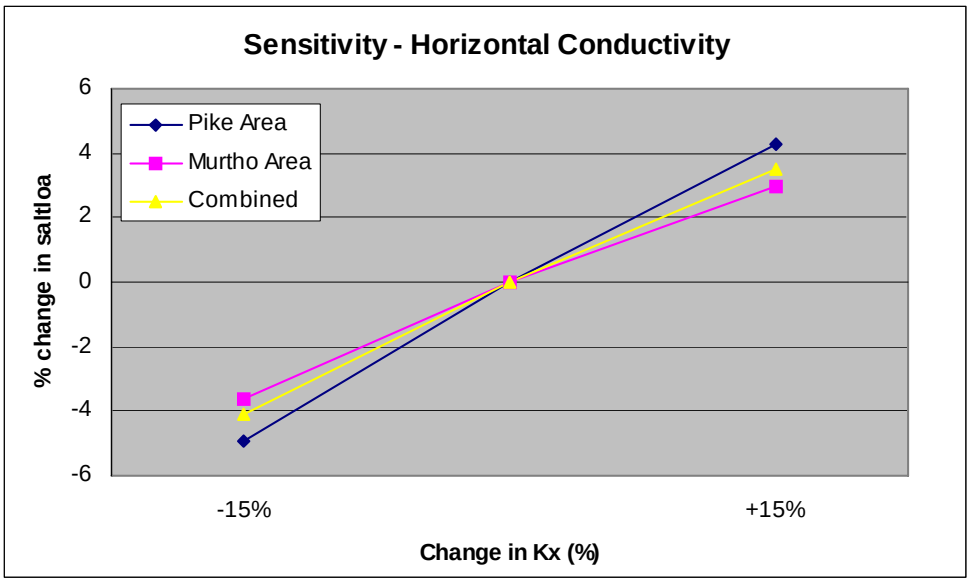


Figure 58. Model sensitivity to hydraulic conductivity of Loxton Sands aquifer

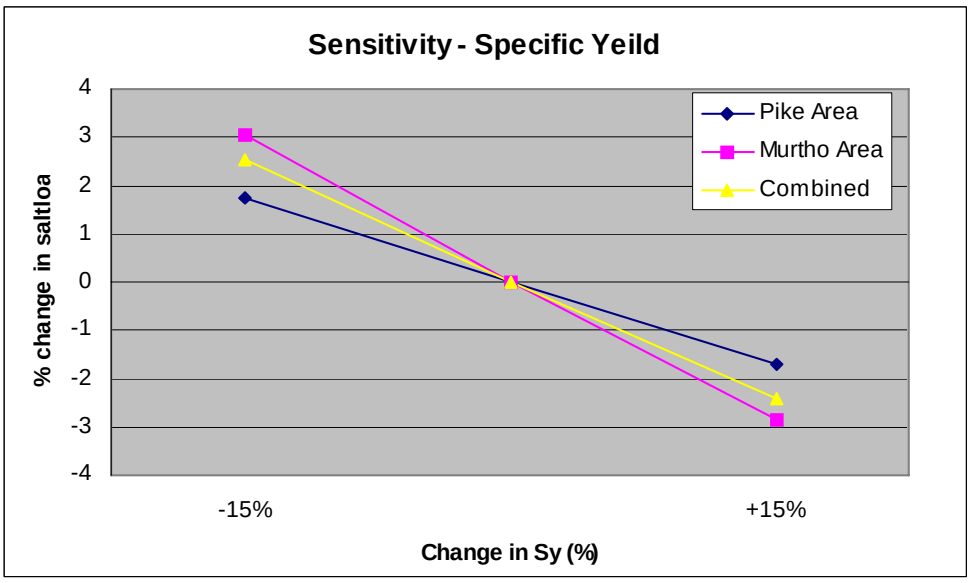


Figure 59. Model sensitivity to specific yield of Loxton Sands aquifer

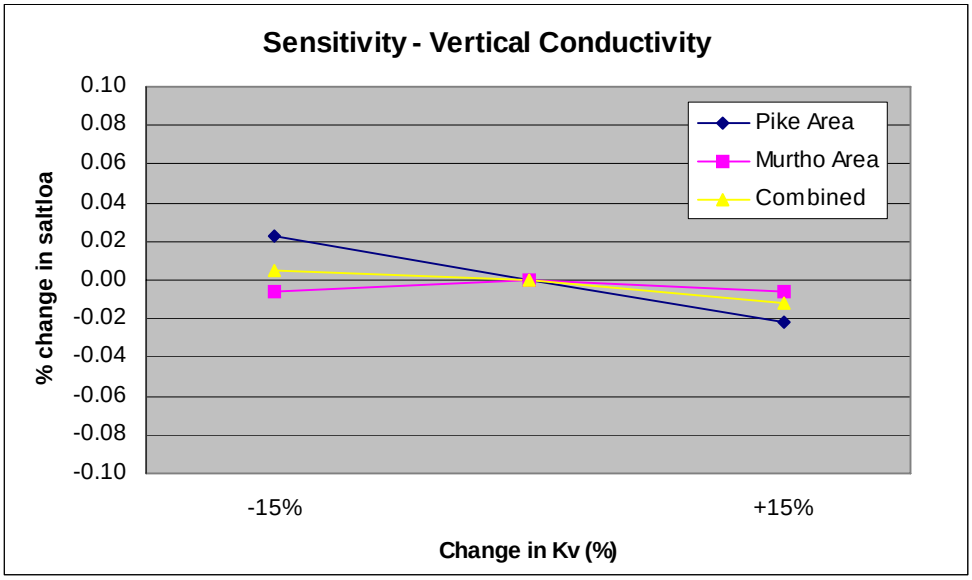


Figure 60. Model sensitivity to vertical hydraulic conductivity of Bookpurnong Beds

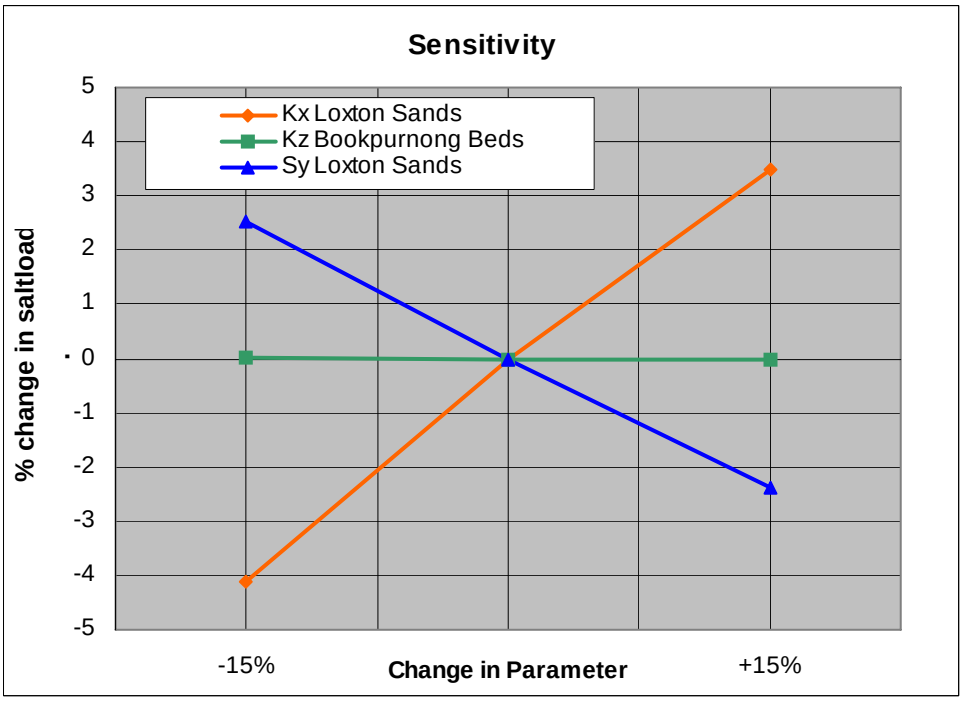


Figure 61. Comparative model sensitivity of the three parameters tested

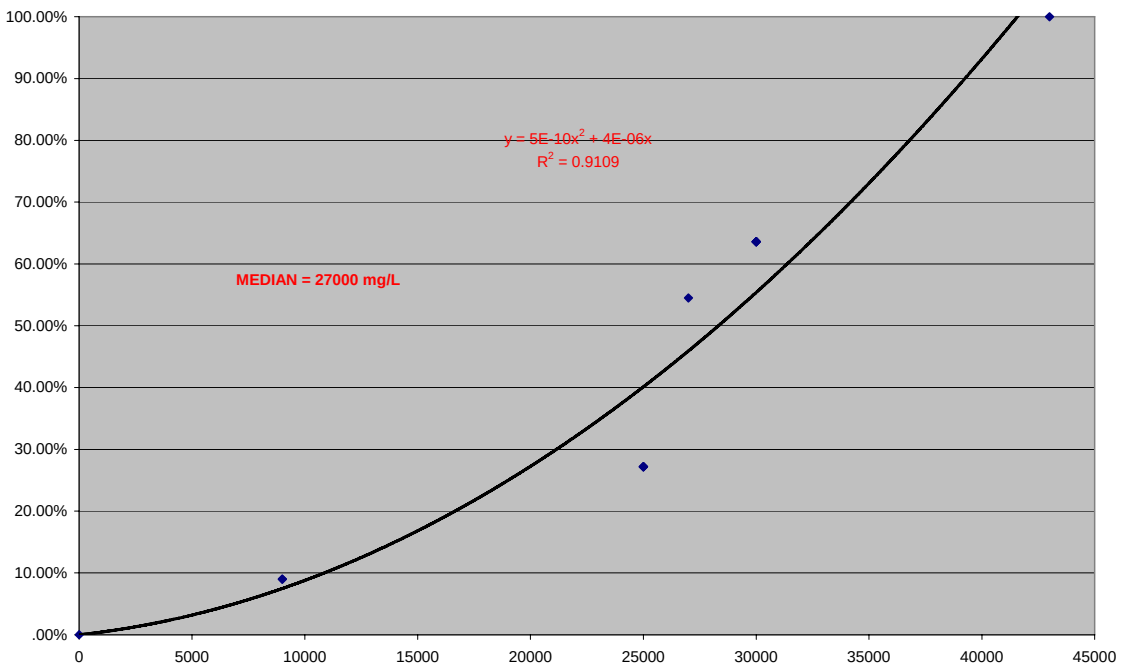


Figure 62. Frequency distribution of groundwater salinity in the model budget zones in the Murtho Area

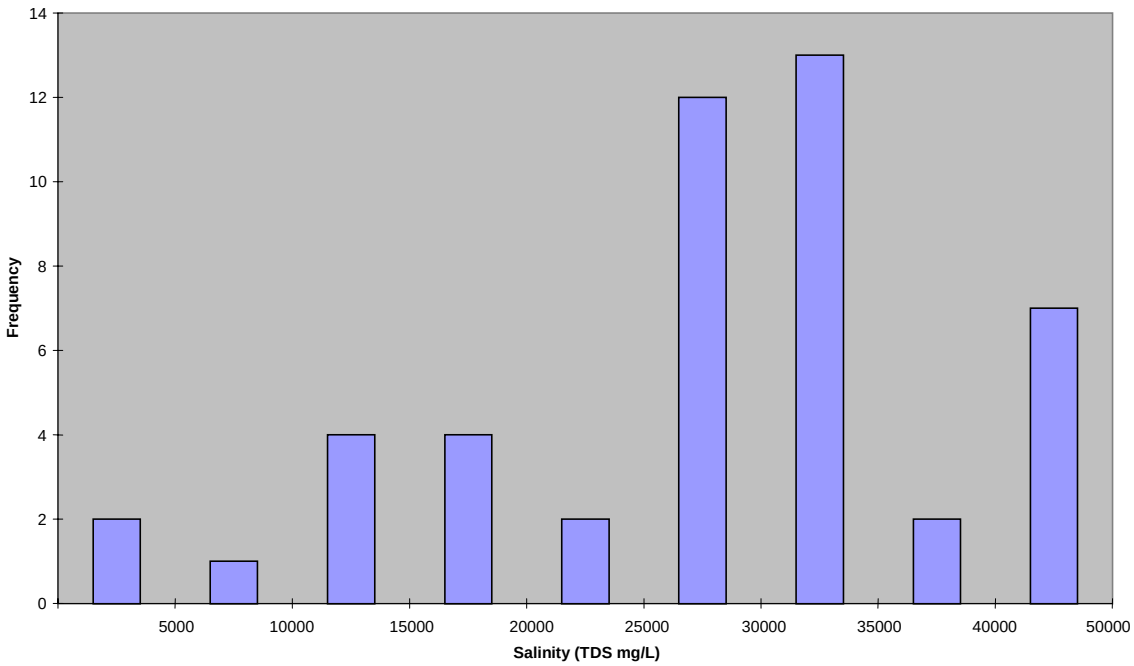


Figure 63. Distribution histogram of relevant groundwater salinity values from the Murtho Area (47 samples)

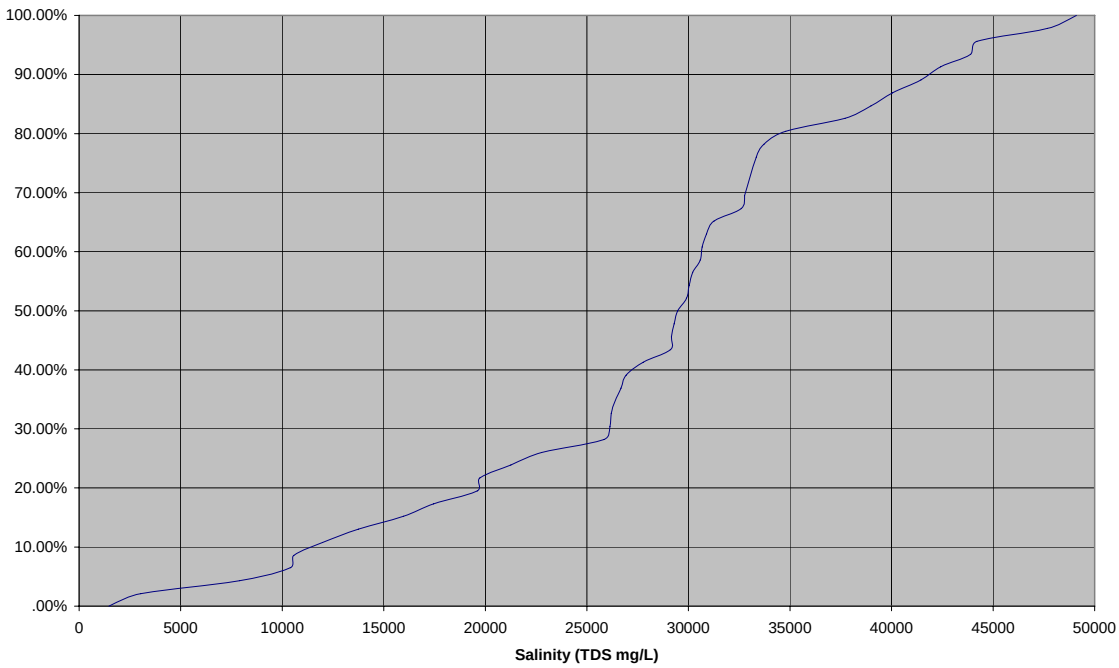


Figure 64. Percentile distribution of all relevant groundwater salinity values in the Murtho area (47 samples)

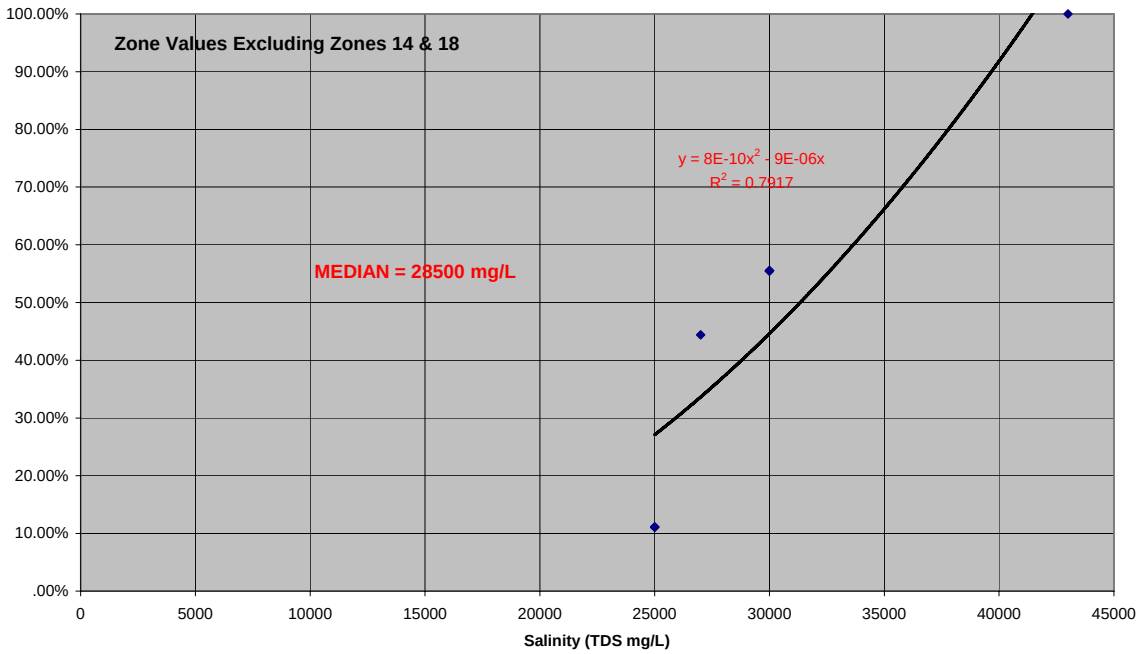


Figure 65. Frequency distribution of groundwater salinity in the model budget zones excluding Zones 14 and 18 (not included in the whole population of values analysed above) in Murtho Area

UNITS OF MEASUREMENT

Units of measurement commonly used (SI and non-SI Australian legal)

Name of unit	Symbol	Definition in terms of other metric units	Quantity
day	d	24 h	time interval
gigalitre	GL	10^6 m^3	volume
gram	g	10^{-3} kg	mass
hectare	ha	10^4 m^2	area
hour	h	60 min	time interval
kilogram	kg	base unit	mass
kilolitre	kL	1 m^3	volume
kilometre	km	10^3 m	length
litre	L	10^{-3} m^3	volume
megalitre	ML	10^3 m^3	volume
metre	m	base unit	length
microgram	µg	10^{-6} g	mass
microlitre	µL	10^{-9} m^3	volume
milligram	mg	10^{-3} g	mass
millilitre	mL	10^{-6} m^3	volume
millimetre	mm	10^{-3} m	length
minute	min	60 s	time interval
second	s	base unit	time interval
tonne	t	1000 kg	mass
year	y	356 or 366 days	time interval

EC	electrical conductivity (µS/cm)
pH	acidity
TDS	total dissolved solids (mg/L)

GLOSSARY

Act. The *Water Resources Act 1997* (South Australia).

Anabranch. A branch of a river that leaves the main stream.

Aquifer. An underground layer of rock or sediment that holds water and allows water to percolate through.

Aquifer, confined. Aquifer in which the upper surface is impervious and the water is held at greater than atmospheric pressure. Water in a penetrating well will rise above the surface of the aquifer.

Aquifer test. A hydrological test performed on a well, aimed to increase the understanding of the aquifer properties, including any interference between wells, and to more accurately estimate the sustainable use of the water resource available for development from the well.

Aquifer, unconfined. Aquifer in which the upper surface has free connection to the ground surface and the water surface is at atmospheric pressure.

Aquitard. A layer in the geological profile that separates two aquifers and restricts the flow between them.

Artesian. Under pressure such that when wells penetrate the aquifer water will rise to the ground surface without the need for pumping.

Basin. The area drained by a major river and its tributaries.

Benchmark condition. Points of reference from which change can be measured.

Bore. *See well.*

EC. Abbreviation for electrical conductivity. 1 EC unit = 1 micro-Siemen per centimetre (µS/cm)

Erosion. Natural breakdown and movement of soil and rock by water, wind or ice. The process may be accelerated by human activities.

Evapotranspiration. The total loss of water as a result of transpiration from plants and evaporation from land, and surface waterbodies.

Floodplain. Of a watercourse means: (a) the floodplain (if any) of the watercourse identified in a catchment water management plan or a local water management plan; adopted under Part 7 of the Water Resources Act 1997; or (b) where paragraph (a) does not apply — the floodplain (if any) of the watercourse identified in a development plan under the Development Act 1993, or (c) where neither paragraph (a) nor paragraph (b) applies — the land adjoining the watercourse that is periodically subject to flooding from the watercourse.

Future irrigation Development Future irrigation development area and recharge (assuming recharge of 100 mm/yr) resulting from activation of already allocated water that is assumed to occur after the current year

Gigalitre (GL). One thousand million litres (1 000 000 000).

GIS (geographic information system). Computer software allows for the linking of geographic data (for example land parcels) to textual data (soil type, land value, ownership). It allows for a range of features, from simple map production to complex data analysis.

GL. *See gigalitre.*

Groundwater. *See underground water.*

Hydrogeology. The study of groundwater, which includes its occurrence, recharge and discharge processes and the properties of aquifers. *(See hydrology.)*

Hydrology. The study of the characteristics, occurrence, movement and utilisation of water on and below the earth's surface and within its atmosphere. *(See hydrogeology.)*

Infrastructure. Artificial lakes; or dams or reservoirs; or embankments, walls, channels or other works; or buildings or structures; or pipes, machinery or other equipment.

Irrigation. Watering land by any means for the purpose of growing plants.

Irrigation season. The period in which major irrigation diversions occur, usually starting in August–September and ending in April–May.

Improved Irrigation Practices (IIP). Commencing in the mid 1990s when flood irrigation via earth channels was replaced by sprinkler and drip irrigation systems, thus increasing irrigation efficiency (70–85%) and reducing recharge to the groundwater table

Lag time. Time (years) taken for recharge to reach the groundwater table. Lag time is affected by depth to groundwater table and the presence and properties of aquitards.

Lake. A natural lake, pond, lagoon, wetland or spring (whether modified or not) and includes: part of a lake; and a body of water declared by regulation to be a lake; a reference to a lake is a reference to either the bed, banks and shores of the lake or the water for the time being held by the bed, banks and shores of the lake, or both, depending on the context.

Land. Whether under water or not and includes an interest in land and any building or structure fixed to the land.

Licence. A licence to take water in accordance with the Water Resources Act 1997. *(See water licence.)*

Mallee Clearance. Clearance of natural vegetation

MDBC. Murray-Darling Basin Commission.

Megalitre (ML). One million litres (1 000 000).

ML. *See megalitre.*

Model. A conceptual or mathematical means of understanding elements of the real world which allows for predictions of outcomes given certain conditions. Examples include estimating storm runoff, assessing the impacts of dams or predicting ecological response to environmental change.

Modelled result. Output from the calibrated model (e.g. a potentiometric head distribution) that can be compared to observed data

Natural recharge. The infiltration of water into an aquifer from the surface (rainfall, streamflow, irrigation etc.) *(See recharge area, artificial recharge.)*

Occupier of land. A person who has, or is entitled to, possession or control of the land.

Percentile. A way of describing sets of data by ranking the data set and establishing the value for each percentage of the total number of data records. The 90th percentile of the distribution is the value such that 90% of the observations fall at or below it.

Permeability. A measure of the ease with which water flows through an aquifer or aquitard.

PIRSA. (Department of) Primary Industries and Resources South Australia.

Post-1988 irrigation. Irrigation development area and recharge that occurred between 01/01/1988 and the current year

Pre – Committed Water. Water allocation that has been approved but is not yet being used.

Pre-1988 irrigation. Irrigation development area and recharge that occurred prior to 01/01/1988

Predicted result. Output from the prediction model has been used to determine the future result of a particular scenario

Prescribed water resource. A water resource declared by the Governor to be prescribed under the Act, and includes underground water to which access is obtained by prescribed wells. Prescription of a water resource requires that future management of the resource be regulated via a licensing system.

Recharge. Irrigation drainage and/or rainfall infiltration reaching the groundwater table

Recharge area. The area of land from which water from the surface (rainfall, streamflow, irrigation, etc.) infiltrates into an aquifer. *(See artificial recharge, natural recharge.)*

Rehabilitation (RH). Replacement of leaky concrete water distribution channels with pipelines resulting in reduced transportation losses, which are reflected by reduced recharge to the groundwater table

SIS. Salt Interception Scheme designed to intercept the (maximum) groundwater flux and salt load resulting from the pre-1988, post-1988 and future irrigation development

Surface water. (a) water flowing over land (except in a watercourse), (i) after having fallen as rain or hail or having precipitated in any another manner, (ii) or after rising to the surface naturally from underground; (b) water of the kind referred to in paragraph (a) that has been collected in a dam or reservoir.

Underground water (groundwater). Water occurring naturally below ground level or water pumped, diverted or released into a well for storage underground

Water licence. A licence granted under the Act entitling the holder to take water from a prescribed watercourse, lake or well or to take surface water from a surface water prescribed area. This grants the licensee a right to take an allocation of water specified on the licence, which may also include conditions on the taking and use of that water. A water licence confers a property right on the holder of the licence and this right is separate from land title.

Waterbody. Waterbodies include watercourses, riparian zones, floodplains, wetlands, estuaries, lakes and groundwater aquifers.

Watercourse. A river, creek or other natural watercourse (whether modified or not) and includes: a dam or reservoir that collects water flowing in a watercourse; and a lake through which water flows; and a channel (but not a channel declared by regulation to be excluded from the this definition) into which the water of a watercourse has been diverted; and part of a watercourse.

Well. (a) an opening in the ground excavated for the purpose of obtaining access to underground water; (b) an opening in the ground excavated for some other purpose but that gives access to underground water; (c) a natural opening in the ground that gives access to underground water.

REFERENCES

Allison G.B., Cook P.G., Barnett S.R., Walker G.R., Jolly I.D., and Hughes M.W. (1990) Land clearance and river salinisation in the western Murray Basin, Australia. Journal of Hydrology, 119:1-20.

AWE (2003) Loxton- Bookpurnong Salt Interception Schemes Groundwater Model. October 2002 – February 2003 (Draft).

BC Tonkins and Associates 1997. Hydrological Study of Mundic Pike Rumpagunya Anabranch System, Stage 1. Mundic Creek and Upper Pike River.

BC Tonkins and Associates 1998. Hydrological Study of Mundic Pike Rumpagunya Anabranch System, Stage 2. Rumpagunya Creek and Lower Pike River.

Bureau of Meteorology 2006, Commonwealth of Australia, viewed 18 September 2006, <http://www.bom.gov.au>

Cook, P.G., Leaney, F.W. and Miles, M. 2004. Groundwater Recharge in the North-East Mallee Region, South Australia. CSRIO Land and Water Technical Report No 25/04.

Evans W.R. and Kellet J.R. (1989) The hydrogeology of the Murray Basin, southeastern Australia. BMR Journal of Australian Geology and Geophysics, 11: 147 – 166.

Holland K., Jolly I.D., Tyerman S., Mansforth L., Telfer Andrew. and Walker G.R. (2001) Interception of groundwater discharge by floodplain in the lower River Murray: Implications for river salinity. 8th Murray Darling Basin Groundwater Workshop 2001.

Howles, S.R. and Smith, A.G., 2005. Loxton Salt Interception Scheme Aquifer Testing and Well Hydraulics. *South Australia. Department of Water, Land and Biodiversity Conservation. Report,* DWLBC 2005/20.

McDonald M.G. and Harbaugh A.W. (1988) A modular three-dimensional finite-difference groundwater flow model. Techniques of Water-Resources Investigations of the United State Geological Survey. Modelling Techniques Book 6.

Murray Darling Basin Commission (2001) Groundwater Flow Modelling Guideline. August 2001.

Porter, B 2001. Run of River Salinity Surveys – A Method of Measuring salt Load Accessions to the River Murray on a Kilometre by Kilometre basis. *Proceedings of 8th Murray Darling Basin Groundwater Workshop 2001.*

Primary Industries South Australia 1995. Data Report 2 Hydrogeology and Assessment of Irrigation Drainage Impacts. Pike Mundic Private Irrigation Areas.

REM 2002a. Hydrogeological Assessment of the Pike River and Murtho land and water management planning areas – Stage 3. Report prepared for the Renmark to Border Local Action Planning Association Inc.

REM 2002b. Hydrogeological Assessment of the Pike River and Murtho land and water management planning areas – Stage 2. Report prepared for the Renmark to Border Local Action Planning Association Inc.

REM (2003). Hydrogeological benchmark assessment for the River Murray between Wentworth and Renmark. Assessment and GIS mapping of key hydrogeological and wetland features. Prepared for the Mallee Catchment Management Authority.

REM-Aquaterra 2005a. Salt Interception Scheme Concept Design Murtho and Pike River, Hydrogeology and Proposed Groundwater Modelling Approach. Prepared for Department of Water, Land and Biodiversity Conservation. August 2005.

REM-Aquaterra 2005b. Salt Interception Scheme Concept Design Murtho and Pike River, Groundwater Modelling and Salt Interception Scheme Concept Design Report. Prepared for Department of Water, Land and Biodiversity Conservation. September 2005.

Salient Solutions 2005. Review of Three South Australian Groundwater Models, Morgan to Lock3, South Australian Dryland Clearing and Pike-Murtho. Report prepared for MDBC.

Stadter, M 2005. Pike Murtho Highland Drilling Program and Monitoring Network Upgrade Drilling Report 2004. Department of Water, Land and Biodiversity Conservation. Report 2005/09 (in prep).

Smith K., Technical Services (1997) Drainage Report Loxton Irrigation District. Loxton Irrigation Advisory Board and South Australian Water Corporation.

Telfer, A.L., Palfreyman, C. J., Berens, V. and Hatch, M., A. (2004) Atlas of Intream NanoTEM 2004. Australian Water Environments. Prepared for Murray Darling Basin Commission and Mallee Catchment Management Authority.

Woodward-Clyde 1998a. South Australian Border to Pike River Drainage Hazard assessment. Report prepared for Renmark LAP.

Woodward-Clyde 1998b. Lyrup Village Hydrogeological Study. Report prepared for Renmark LAP.

Yan, W., Howles, S., Howe, B. and Hill, T. 2005. Loxton – Bookpurnong Numerical Groundwater Model 2005. South Australia. Department of Water, Land and Biodiversity Conservation. DWLBC Report 2005/17.

DWLBC REPORT

Pike - Murtho Numerical Groundwater Model 2006

Volume 2 - Appendices

2006/26

Government of South Australia
Department of Water, Land and Biodiversity Conservation

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Volume 2 – Appendices

Wei Yan, Brenton Howe, Todd Hodgkin and Michael Stadter

Knowledge and Information Division
Department of Water, Land and Biodiversity Conservation

October 2006

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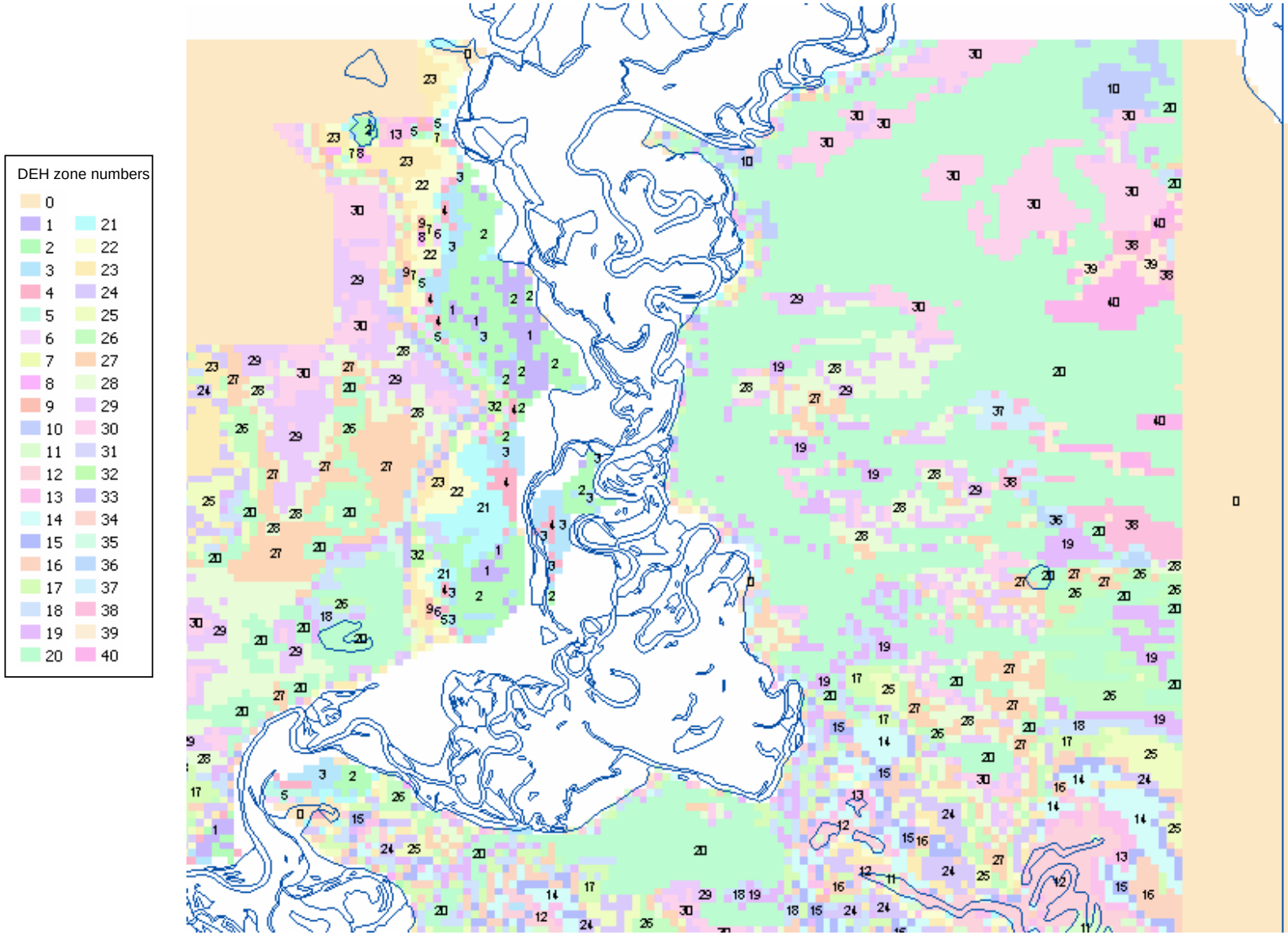
A. MODEL INPUTS

A-1. MODEL INPUT – MALLEE CLEARANCE

- Model recharge zones
- Zone number and recharge rates (mm/yr)



A-1-1. Mallee clearance recharge zones applied in the Pike - Murtho Area (Scenario-2) (DEH zone numbers shown)

Modflow Recharge Zone				41	42	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
DEH Zone No.				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Start Year	Stop Year	Start Day	Stop Day																					
1920	**1930**	***0***	***3650***	0.07	0.18	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.33	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1930	**1940**	***3650***	***7300***	0.07	0.65	0.16	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	2.12	0.39	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1940	**1950**	***7300***	***10950***	0.07	0.71	0.48	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	2.16	1.56	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1950	**1960**	***10950***	***14600***	0.07	0.71	0.67	0.18	0.07	0.07	0.07	0.07	0.07	0.07	0.07	2.16	2.37	0.62	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1960	**1970**	***14600***	***18250***	0.07	0.71	0.70	0.43	0.09	0.07	0.07	0.07	0.07	0.07	0.07	2.16	2.52	1.98	0.15	0.07	0.07	0.07	0.07	0.07	0.07
1970	**1980**	***18250***	***21900***	0.07	0.71	0.70	0.59	0.23	0.07	0.07	0.07	0.07	0.07	0.08	2.16	2.53	2.98	0.71	0.10	0.07	0.07	0.07	0.07	0.07
1980	**1990**	***21900***	***25550***	0.07	0.71	0.70	0.63	0.43	0.12	0.07	0.07	0.07	0.07	0.11	2.16	2.53	3.30	1.83	0.35	0.08	0.07	0.07	0.07	0.07
1990	**2000**	***25550***	***29200***	0.07	0.71	0.70	0.64	0.56	0.25	0.08	0.07	0.07	0.07	0.12	2.16	2.53	3.35	2.79	1.06	0.15	0.07	0.07	0.07	0.07
2000	**2010**	***29200***	***32850***	0.07	0.72	0.70	0.64	0.61	0.41	0.14	0.08	0.07	0.07	0.12	2.16	2.53	3.36	3.24	1.97	0.45	0.11	0.07	0.07	0.07
2010	**2020**	***32850***	***36500***	0.07	0.73	0.70	0.64	0.62	0.54	0.25	0.10	0.07	0.07	0.13	2.16	2.53	3.36	3.37	2.66	1.05	0.26	0.08	0.07	0.07
2020	**2030**	***36500***	***40150***	0.09	0.74	0.70	0.64	0.62	0.61	0.38	0.16	0.09	0.07	0.13	2.16	2.53	3.36	3.40	3.00	1.80	0.63	0.15	0.08	0.07
2030	**2040**	***40150***	***43800***	0.19	0.75	0.70	0.64	0.62	0.63	0.49	0.27	0.14	0.08	0.13	2.16	2.53	3.36	3.40	3.13	2.43	1.23	0.35	0.11	0.07
2040	**2050**	***43800***	***47450***	0.48	0.76	0.70	0.64	0.62	0.64	0.56	0.39	0.23	0.11	0.13	2.16	2.53	3.36	3.40	3.17	2.82	1.91	0.75	0.22	0.07
2050	**2060**	***47450***	***51100***	1.10	0.76	0.70	0.64	0.62	0.64	0.59	0.49	0.35	0.17	0.13	2.16	2.53	3.36	3.40	3.18	3.01	2.48	1.29	0.47	0.09
2060	**2070**	***51100***	***54750***	2.06	0.76	0.70	0.64	0.62	0.64	0.60	0.56	0.49	0.26	0.13	2.16	2.53	3.36	3.40	3.18	3.08	2.86	1.88	0.88	0.12
2070	**2080**	***54750***	***58400***	3.20	0.76	0.70	0.64	0.62	0.64	0.61	0.59	0.61	0.37	0.13	2.16	2.53	3.36	3.40	3.18	3.11	3.07	2.39	1.40	0.17
2080	**2090**	***58400***	***62050***	4.32	0.76	0.70	0.64	0.62	0.64	0.61	0.61	0.70	0.48	0.14	2.16	2.53	3.36	3.40	3.18	3.12	3.17	2.76	1.95	0.27
2090	**2100**	***62050***	***65700***	5.22	0.76	0.70	0.64	0.62	0.64	0.61	0.62	0.76	0.57	0.15	2.16	2.53	3.36	3.40	3.18	3.12	3.22	3.00	2.43	0.40
2100	**2110**	***65700***	***69350***	5.86	0.76	0.70	0.64	0.62	0.64	0.61	0.62	0.79	0.64	0.17	2.16	2.53	3.36	3.40	3.18	3.12	3.24	3.13	2.81	0.55
2110	**2120**	***69350***	***73000***	6.25	0.76	0.70	0.64	0.62	0.64	0.61	0.62	0.81	0.69	0.19	2.16	2.53	3.36	3.40	3.18	3.12	3.24	3.19	3.06	0.73
2120	**2145**	***73000***	***82125***	6.25	0.76	0.70	0.64	0.62	0.64	0.61	0.62	0.81	0.69	0.19	2.16	2.53	3.36	3.40	3.18	3.12	3.24	3.19	3.06	0.73

A-1-2. Mallee clearance recharge rates (Scenario-2)

Modflow Recharge Zone				21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
DEH Zone No.				21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Start Year	Stop Year	Start Day	Stop Day																				
1920	1930	0	3650	2.77	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	2.43	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1930	1940	3650	7300	7.83	0.60	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	10.53	0.87	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1940	1950	7300	10950	8.09	3.63	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	10.90	5.79	0.15	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1950	1960	10950	14600	8.09	6.70	0.97	0.07	0.07	0.07	0.07	0.07	0.07	0.07	10.90	10.15	2.24	0.08	0.07	0.07	0.07	0.07	0.07	0.07
1960	1970	14600	18250	8.09	7.35	3.68	0.35	0.07	0.07	0.07	0.07	0.07	0.07	10.90	10.91	6.82	0.56	0.07	0.07	0.07	0.07	0.07	0.07
1970	1980	18250	21900	8.09	7.38	6.23	1.91	0.13	0.07	0.07	0.07	0.07	0.07	10.90	10.94	9.91	3.12	0.18	0.07	0.07	0.07	0.07	0.07
1980	1990	21900	25550	8.09	7.38	7.16	4.37	0.64	0.09	0.07	0.07	0.07	0.07	10.90	10.94	10.83	6.89	1.07	0.09	0.07	0.07	0.07	0.07
1990	2000	25550	29200	8.09	7.38	7.32	6.08	2.19	0.26	0.08	0.07	0.07	0.07	10.90	10.94	10.97	9.51	3.50	0.26	0.08	0.07	0.07	0.07
2000	2010	29200	32850	8.09	7.38	7.34	6.78	4.34	0.97	0.15	0.07	0.07	0.07	10.90	10.94	10.99	10.62	6.60	1.03	0.18	0.08	0.07	0.07
2010	2020	32850	36500	8.09	7.38	7.34	6.97	6.06	2.44	0.51	0.10	0.07	0.07	10.90	10.94	10.99	10.94	8.93	2.82	0.64	0.13	0.07	0.07
2020	2030	36500	40150	8.09	7.38	7.34	7.01	6.97	4.30	1.41	0.27	0.09	0.07	10.90	10.94	10.99	11.00	10.13	5.29	1.81	0.39	0.10	0.07
2030	2040	40150	43800	8.09	7.38	7.34	7.01	7.32	5.89	2.85	0.74	0.18	0.07	10.90	10.94	10.99	11.01	10.60	7.62	3.72	1.13	0.25	0.08
2040	2050	43800	47450	8.09	7.38	7.34	7.01	7.42	6.89	4.48	1.67	0.45	0.09	10.90	10.94	10.99	11.01	10.76	9.22	5.91	2.53	0.69	0.11
2050	2060	47450	51100	8.09	7.38	7.34	7.01	7.45	7.39	5.85	2.98	1.05	0.15	10.90	10.94	10.99	11.01	10.82	10.08	7.82	4.44	1.66	0.24
2060	2070	51100	54750	8.09	7.38	7.34	7.01	7.46	7.60	6.77	4.39	1.99	0.30	10.90	10.94	10.99	11.01	10.86	10.45	9.15	6.42	3.21	0.54
2070	2080	54750	58400	8.09	7.38	7.34	7.01	7.46	7.67	7.28	5.61	3.18	0.59	10.90	10.94	10.99	11.01	10.89	10.59	9.93	8.07	5.14	1.11
2080	2090	58400	62050	8.09	7.38	7.34	7.01	7.46	7.70	7.53	6.51	4.40	1.06	10.90	10.94	10.99	11.01	10.90	10.64	10.31	9.22	7.11	2.00
2090	2100	62050	65700	8.09	7.38	7.34	7.01	7.46	7.70	7.63	7.06	5.45	1.69	10.90	10.94	10.99	11.01	10.91	10.65	10.48	9.90	8.79	3.17
2100	2110	65700	69350	8.09	7.38	7.34	7.01	7.46	7.70	7.67	7.37	6.23	2.43	10.90	10.94	10.99	11.01	10.92	10.66	10.55	10.27	10.04	4.51
2110	2120	69350	73000	8.09	7.38	7.34	7.01	7.46	7.70	7.69	7.53	6.75	3.21	10.90	10.94	10.99	11.01	10.92	10.66	10.58	10.44	10.87	5.90
2120	2145	73000	82125	8.09	7.38	7.34	7.01	7.46	7.70	7.69	7.53	6.75	3.21	10.90	10.94	10.99	11.01	10.92	10.66	10.58	10.44	10.87	5.90

A-1-3. Mallee clearance recharge rates (Scenario-2)

A-2. MODEL INPUT – NORTH MURTHO AREA

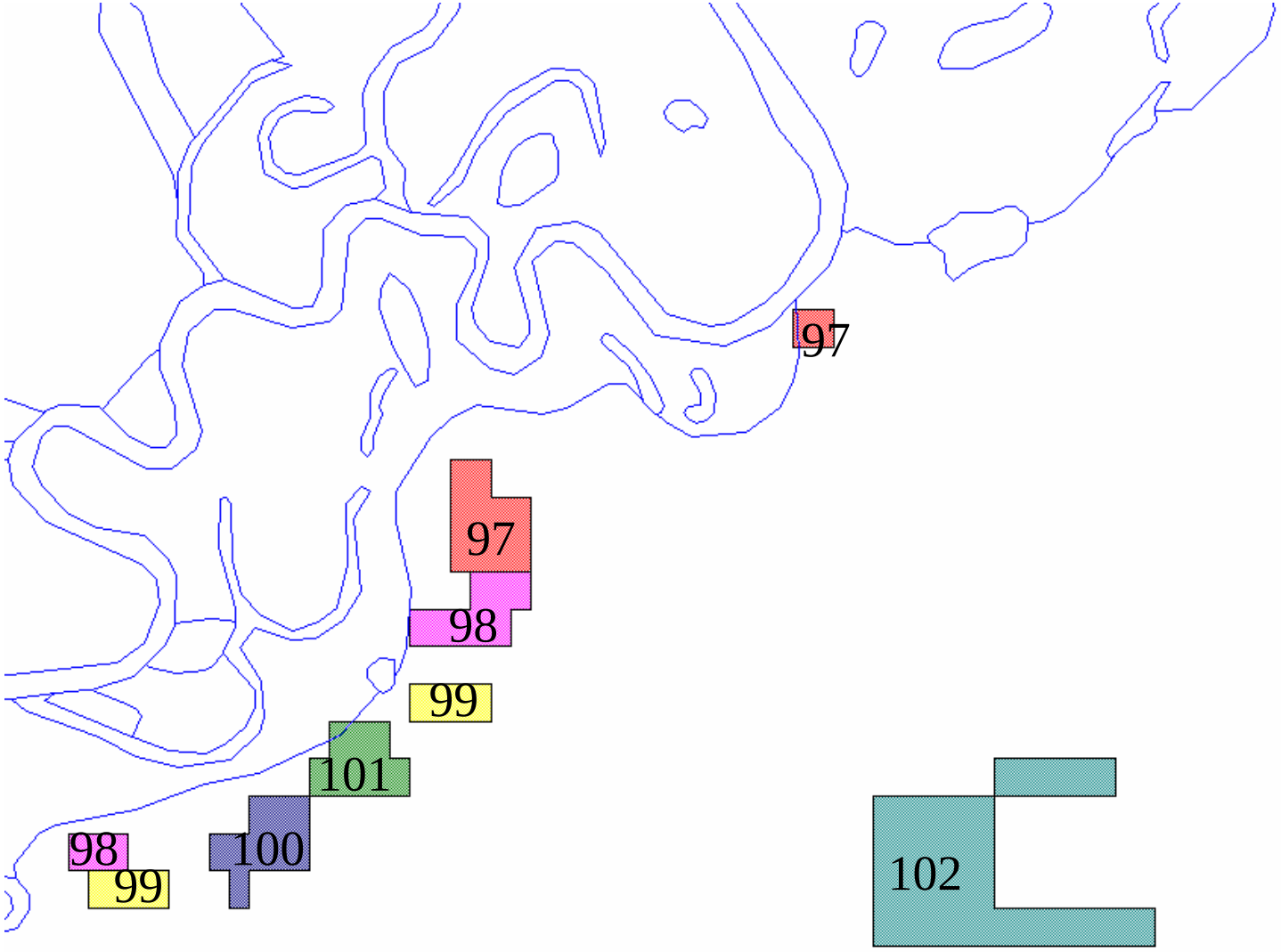
- Model recharge zones
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-2. Model Scenario conditions



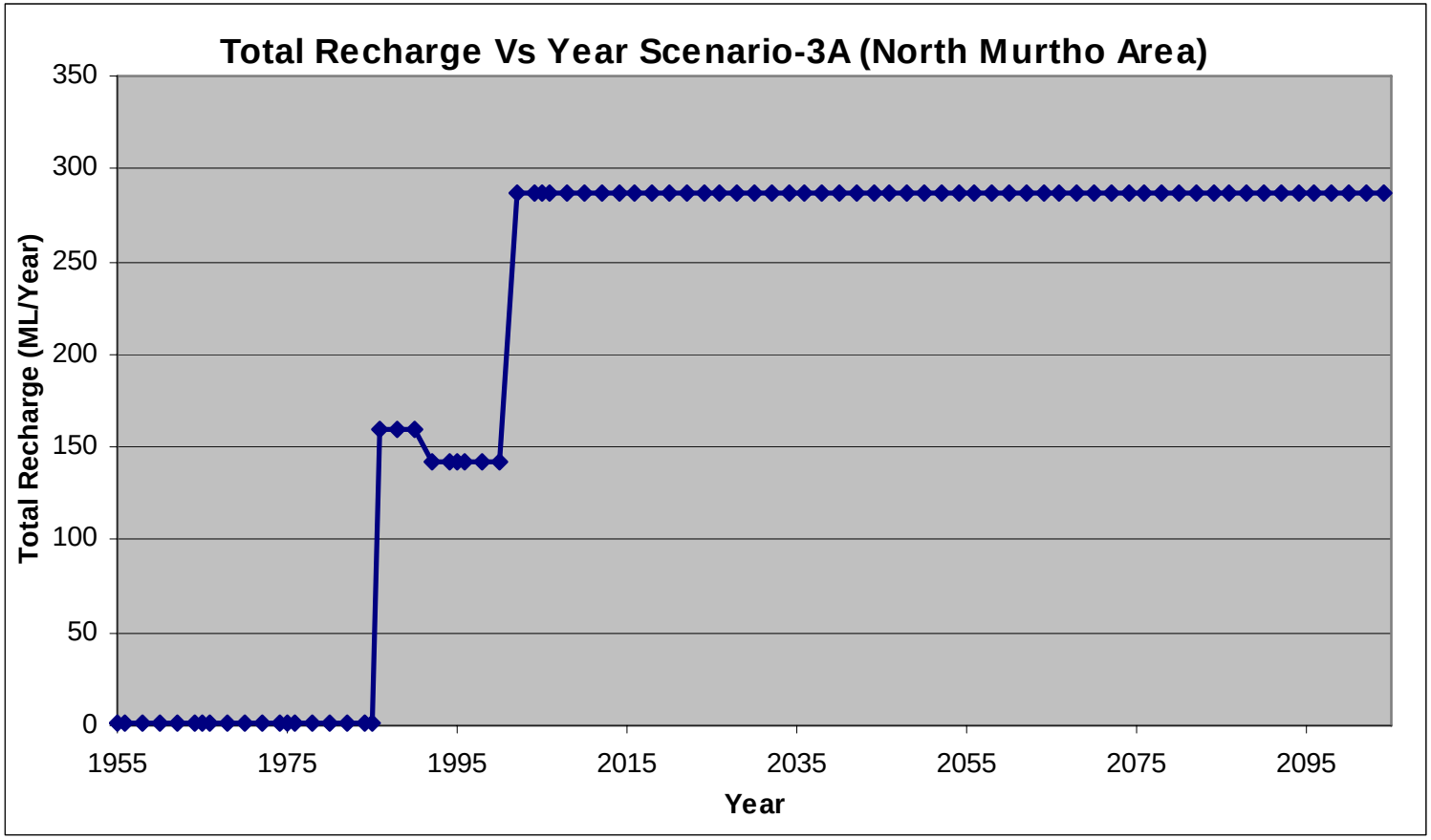
A-2. Model recharge zones in the North Murtho Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	455	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	405	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	405	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	405	455	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	405	455	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	405	455	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	405	455	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	405	455	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	405	455	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	405	455	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	405	455	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	405	455	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	405	455	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	405	455	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	405	455	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	405	455	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	405	455	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	405	455	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	405	455	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	405	455	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	405	455	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	405	455	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	405	455	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	405	455	0.1	0.1	0.1	0.1

A-2 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
2044	**2046**	*14235*	*14965*	405	455	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	405	455	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	405	455	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	405	455	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	405	455	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	405	455	0.1	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	405	455	0.1	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	405	455	0.1	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	405	455	0.1	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	405	455	0.1	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	405	455	0.1	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	405	455	0.1	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	405	455	0.1	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	405	455	0.1	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	405	455	0.1	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	405	455	0.1	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	405	455	0.1	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	405	455	0.1	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	405	455	0.1	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	405	455	0.1	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	405	455	0.1	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	405	455	0.1	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	405	455	0.1	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	405	455	0.1	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	405	455	0.1	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	405	455	0.1	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	405	455	0.1	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	405	455	0.1	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	405	455	0.1	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	405	455	0.1	0.1	0.1	0.1

A-2 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (North Murtho Area)



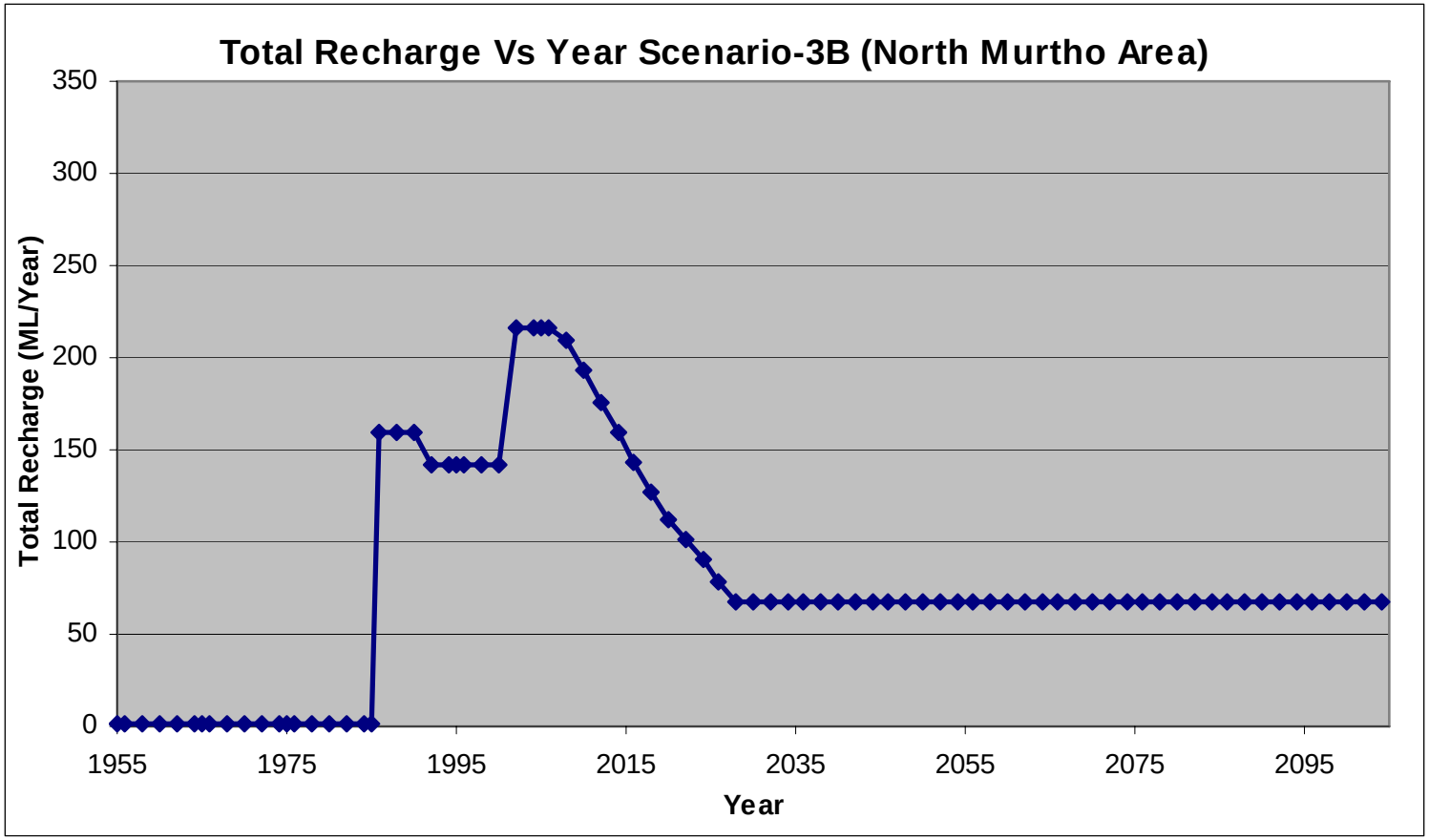
A-2 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	455	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	405	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	405	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	200	455	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	200	455	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	185	450	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	170	415	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	155	380	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	140	345	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	125	310	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	110	275	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	240	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	205	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	170	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	135	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	0.1	0.1	0.1	0.1

A-2 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
2044	**2046**	*14235*	*14965*	100	100	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	0.1	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	0.1	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	0.1	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	0.1	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	0.1	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	0.1	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	0.1	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	0.1	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	0.1	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	0.1	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	0.1	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	0.1	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	0.1	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	0.1	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	0.1	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	0.1	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	0.1	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	0.1	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	0.1	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	0.1	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	0.1	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	0.1	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	0.1	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	0.1	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	0.1	0.1	0.1	0.1

A-2 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (North Murtho Area)



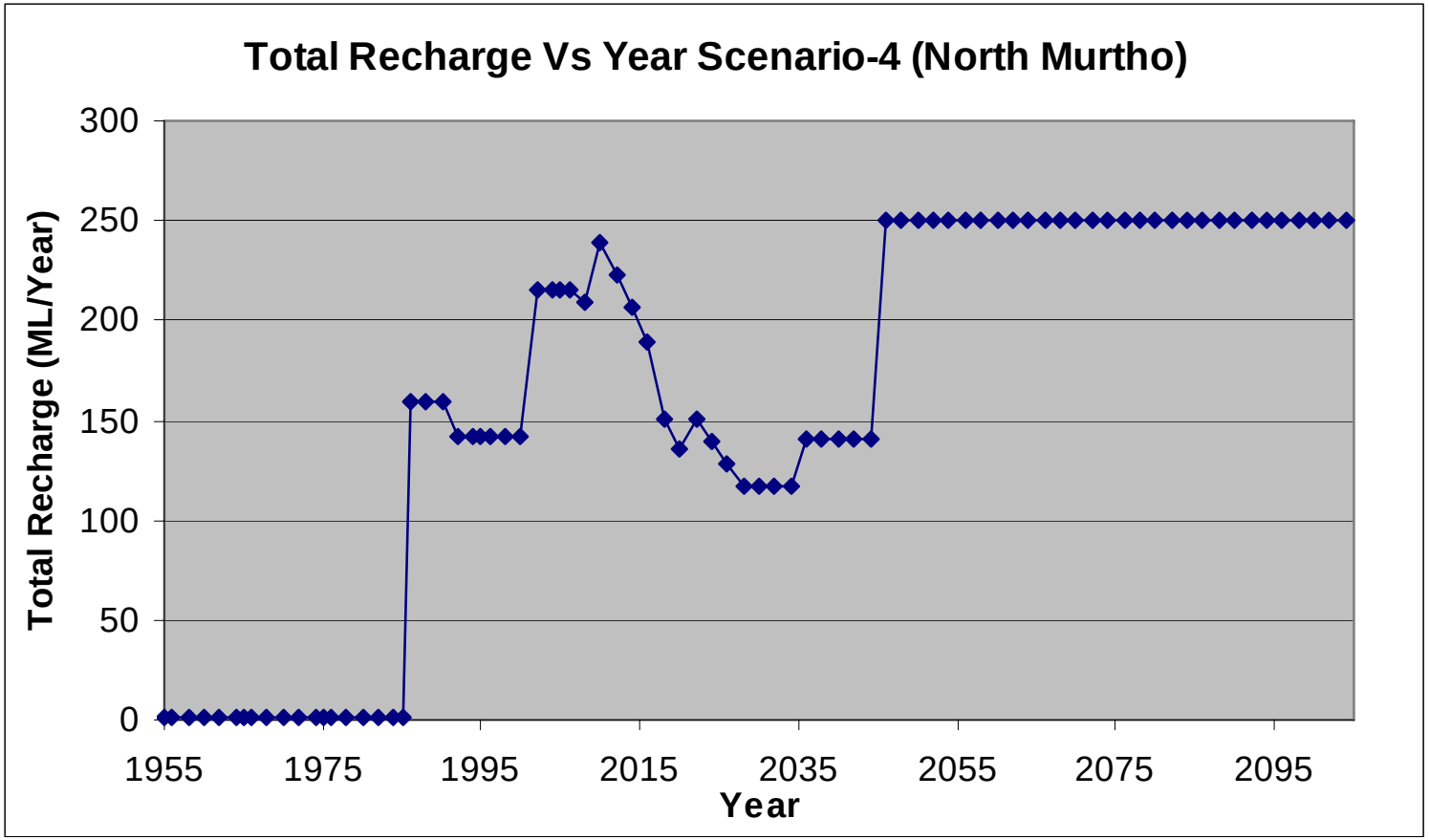
A-2 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	455	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	405	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	405	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	200	455	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	200	455	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	185	450	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	170	415	200	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	155	380	200	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	140	345	200	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	125	310	200	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	110	275	100	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	240	100	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	205	100	100	0.1	0.1
2022	**2024**	*6205*	*6935*	100	170	100	100	0.1	0.1
2024	**2026**	*6935*	*7665*	100	135	100	100	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	100	100	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	100	100	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	0.1

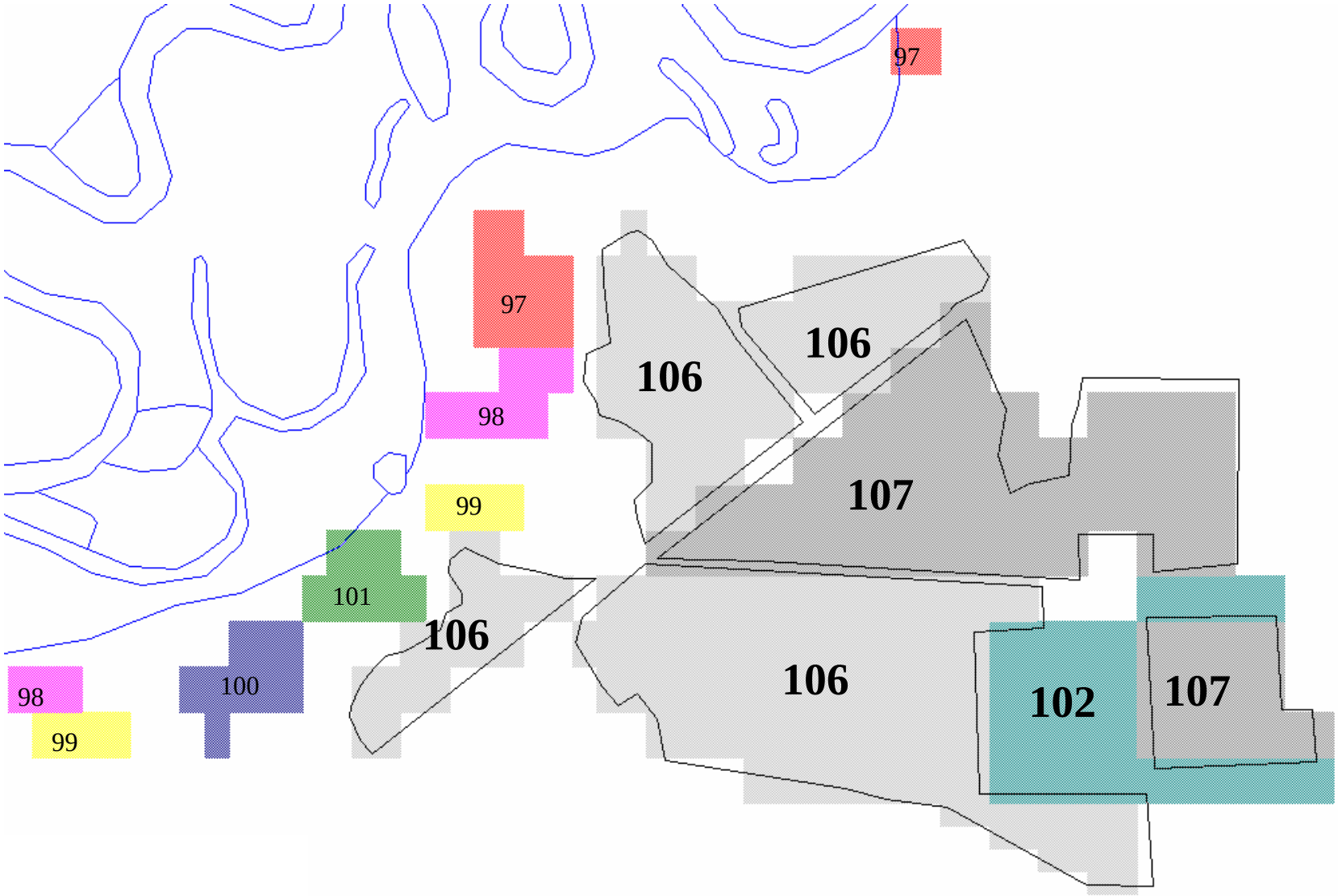
A-2 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003
Lag time (yrs)				5-25	10-20	10-30	20	35	40
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100

A-2 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (North Murtho Area)



A-2 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (North Murtho Area)



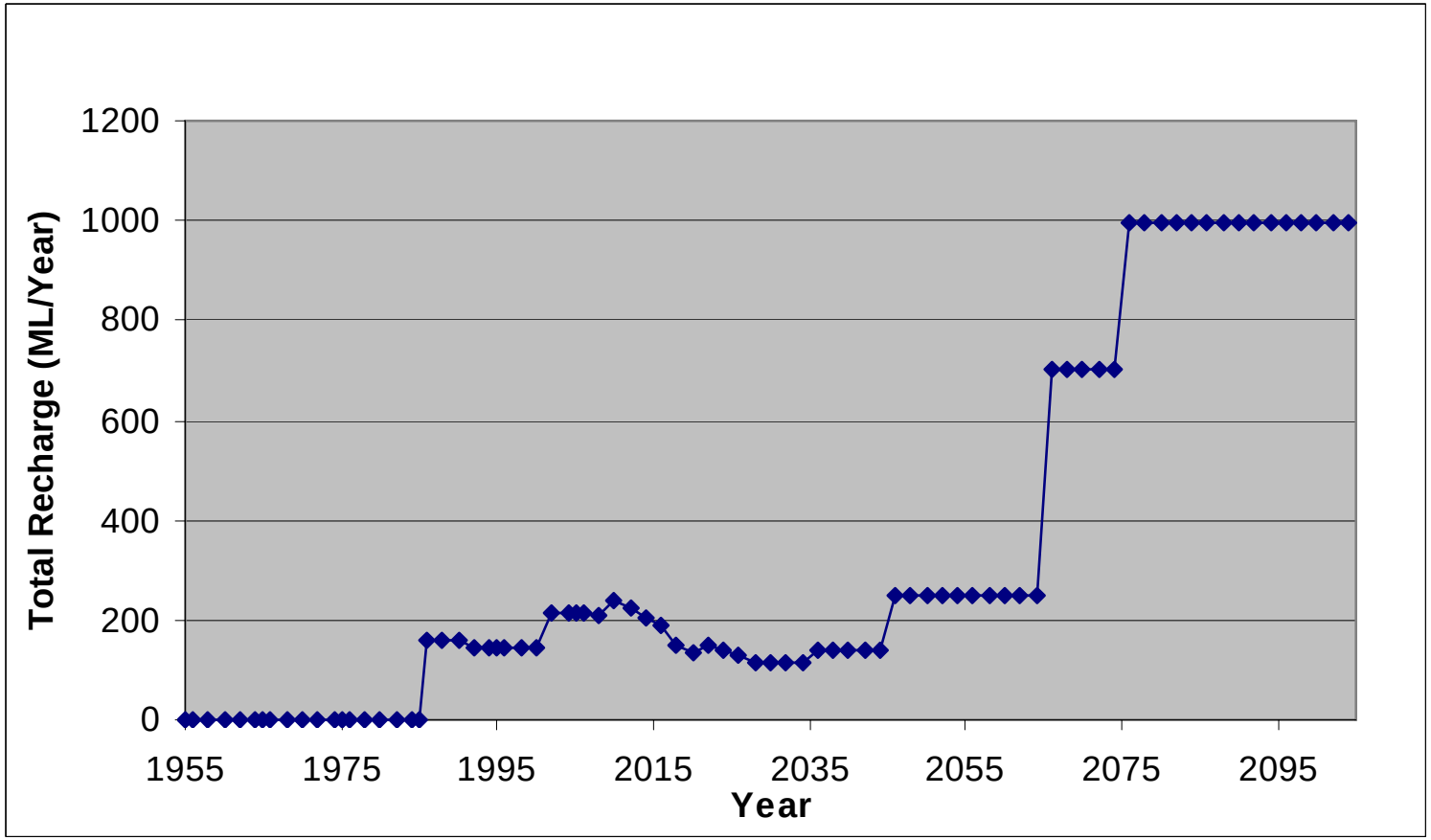
A-2 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003	2015	2015
Lag time (yrs)				5-25	10-20	10-30	20	35	40	50	60
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102	Zone 106	Zone 107
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	455	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	405	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	405	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	200	455	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	200	455	0.1	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	185	450	0.1	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	170	415	200	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	155	380	200	0.1	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	140	345	200	0.1	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	125	310	200	0.1	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	110	275	100	0.1	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	240	100	0.1	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	205	100	100	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	170	100	100	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	135	100	100	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	100	100	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	100	100	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	0.1	0.1	0.1

A-2 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (North Murtho Area)

Irrigation Start year				1960-80	1980-90	1980-95	2000	2000	2003	2015	2015
Lag time (yrs)				5-25	10-20	10-30	20	35	40	50	60
Start Year	Stop Year	Start Day	Stop Day	Zone 97	Zone 98	Zone 99	Zone 100	Zone 101	Zone 102	Zone 106	Zone 107
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100

A-2 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (North Murtho Area)



A-2 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (North Murtho Area)

A-3. MODEL INPUT – CENTRAL MURTHO AREA

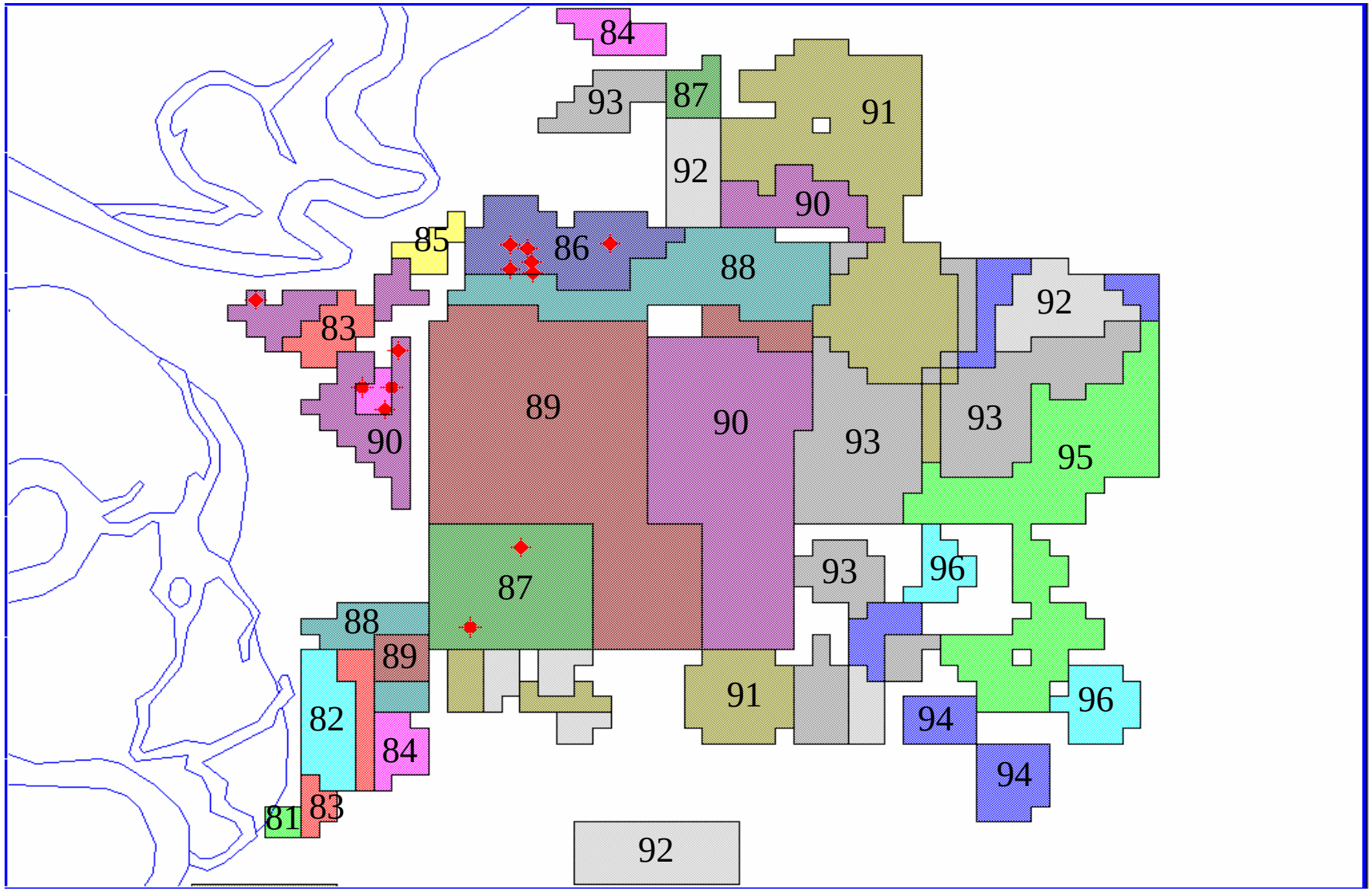
- Model recharge zones
- Drainage bore locations
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-3. Model Scenario conditions



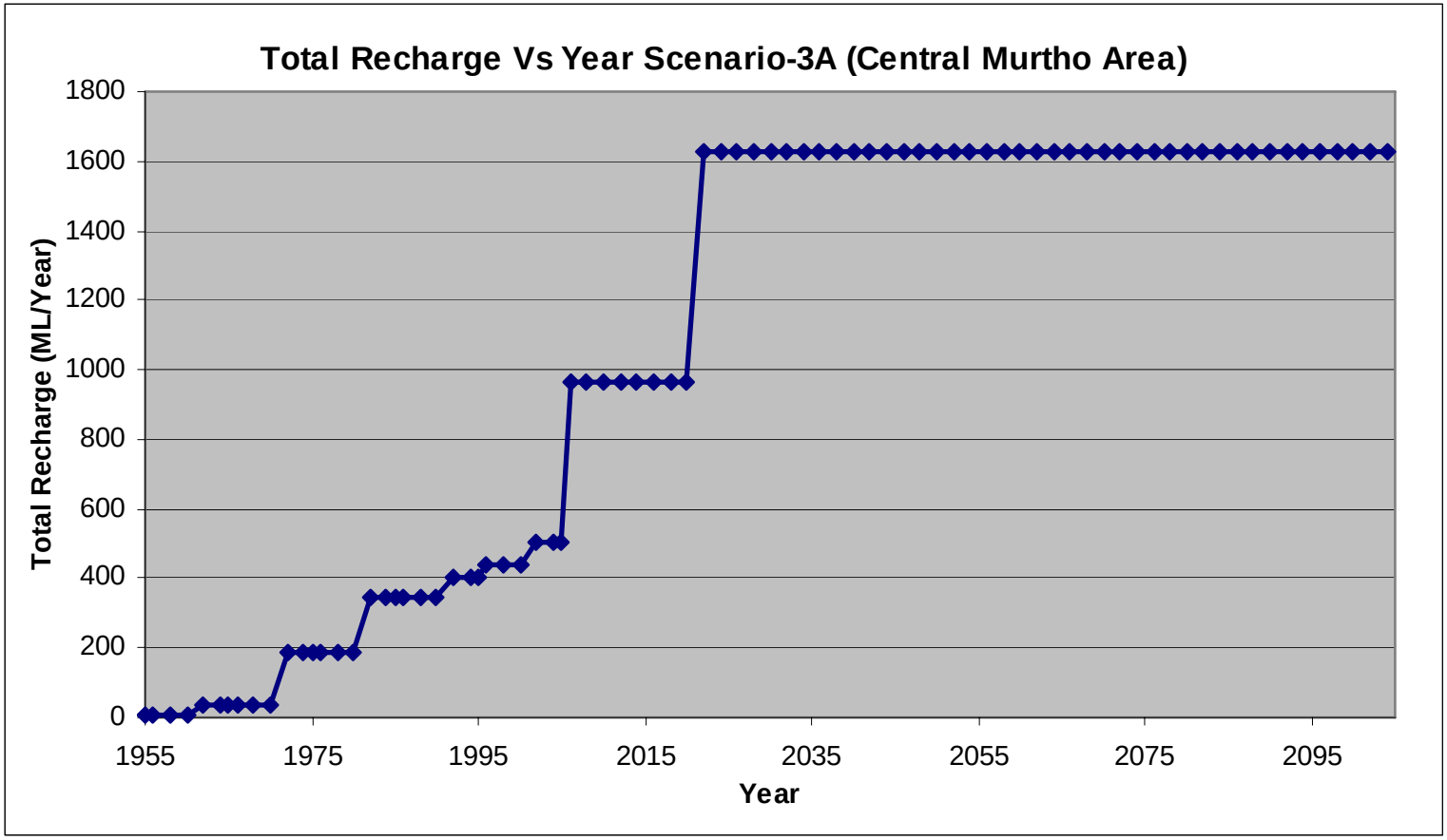
A-3. Model recharge zones and location of drainage bores in the Central Murtho Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	325	325	325	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	325	325	325	285	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	325	325	325	285	285	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	325	325	325	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1

A-3 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
2044	**2046**	*14235*	*14965*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	325	325	325	285	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1

A-3 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Central Murtho Area)



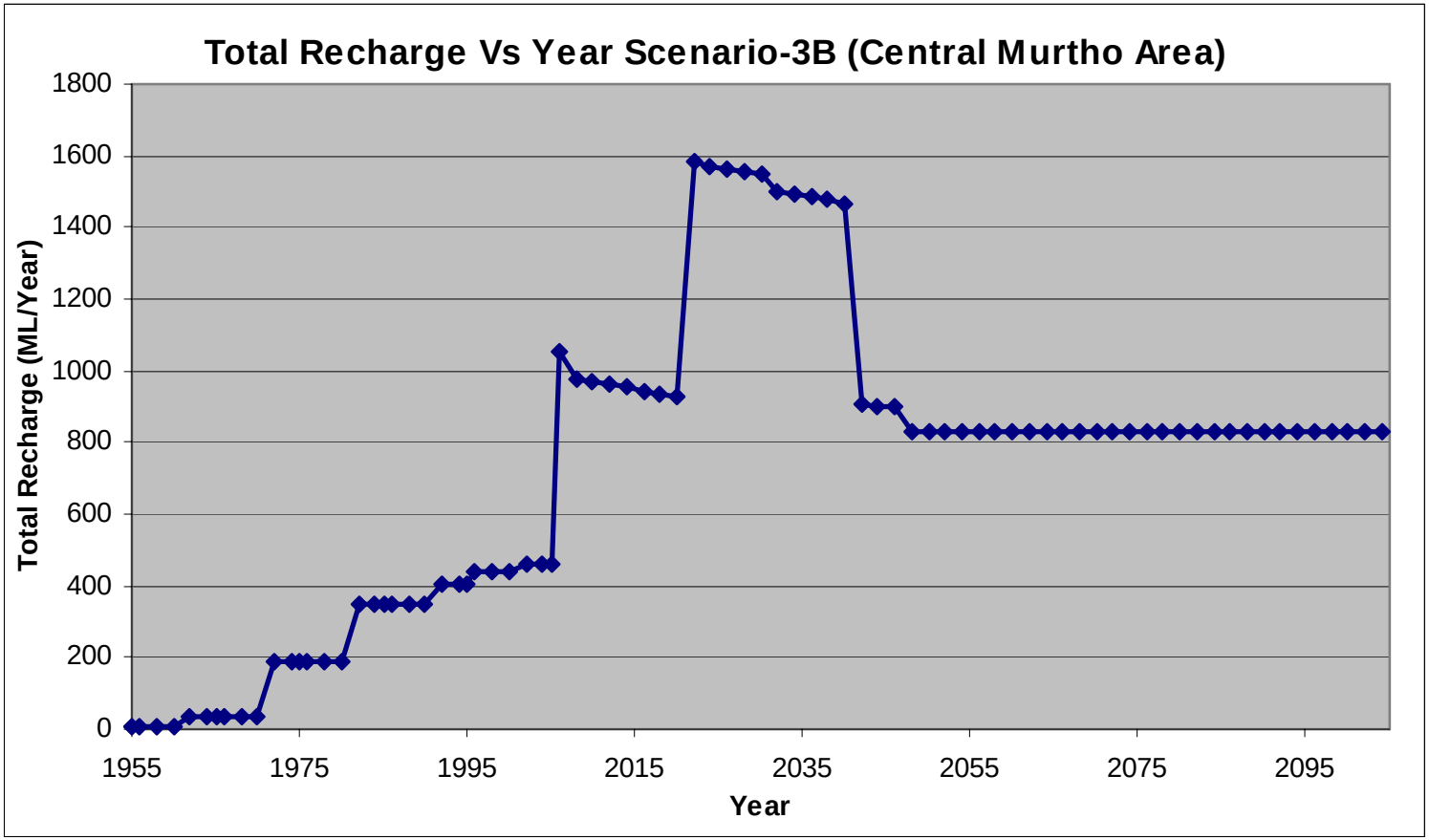
A-3 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	325	325	325	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	325	325	325	285	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	270	270	270	285	285	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	270	270	270	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	100	100	260	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	100	100	250	280	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	100	240	270	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	100	100	230	260	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	100	100	220	250	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	100	210	240	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	100	200	230	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	100	190	220	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	100	180	210	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	100	170	200	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	160	190	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	150	180	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	140	170	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	130	160	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	120	150	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	110	140	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	130	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	120	100	195	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	110	100	195	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1

A-3 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
2044	**2046**	*14235*	*14965*	100	100	100	100	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1

A-3 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Central Murtho Area)



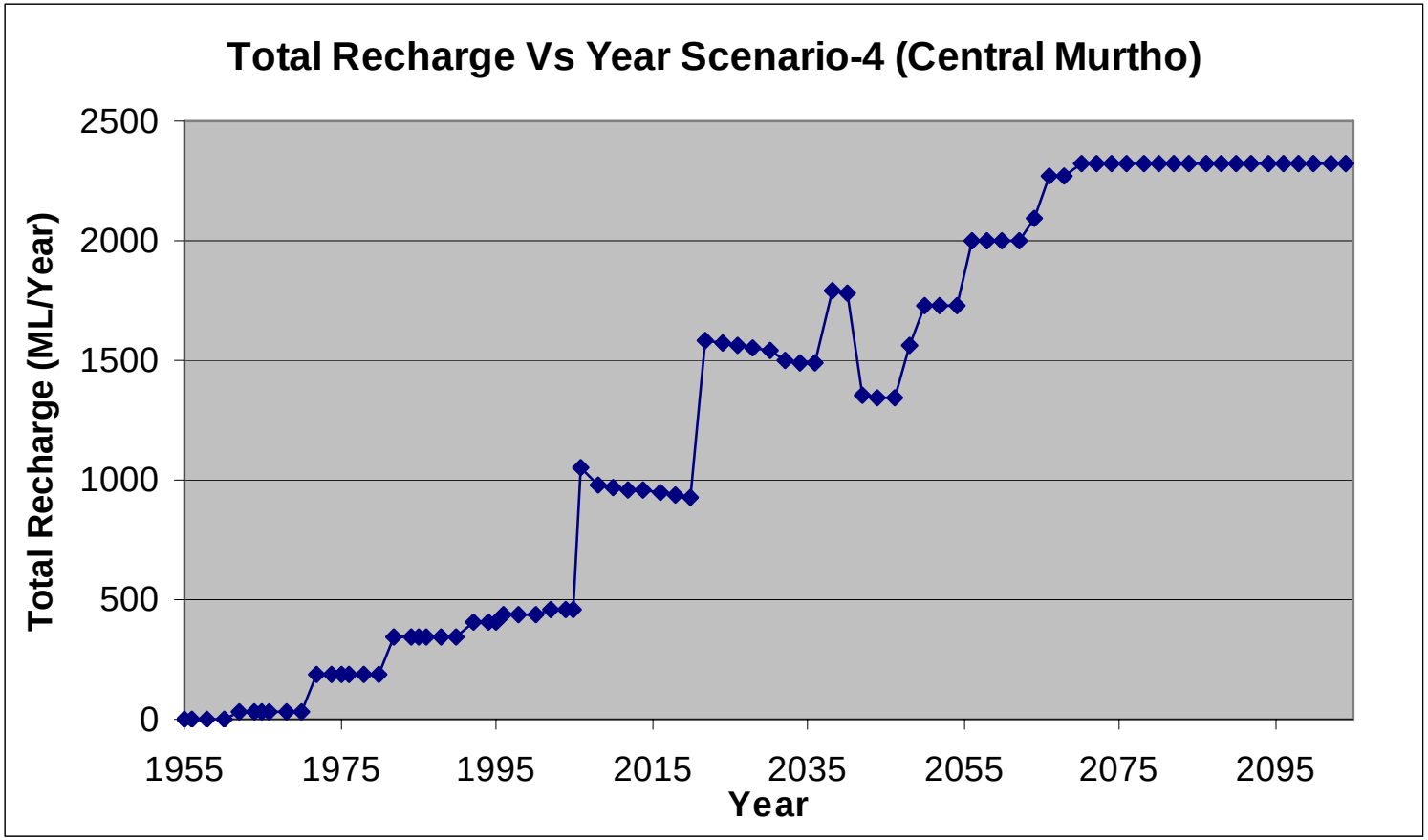
A-3 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	325	325	325	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	325	325	325	285	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	270	270	270	285	285	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	270	270	270	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	100	100	260	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	100	100	250	280	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	100	240	270	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	100	100	230	260	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	100	100	220	250	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	100	210	240	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	100	200	230	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	100	190	220	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	100	180	210	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	100	170	200	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	160	190	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	150	180	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	140	170	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	130	160	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	120	150	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	110	140	285	195	180	180	200	100	0.1	0.1	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	130	285	195	180	180	200	100	0.1	0.1	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	120	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	110	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1

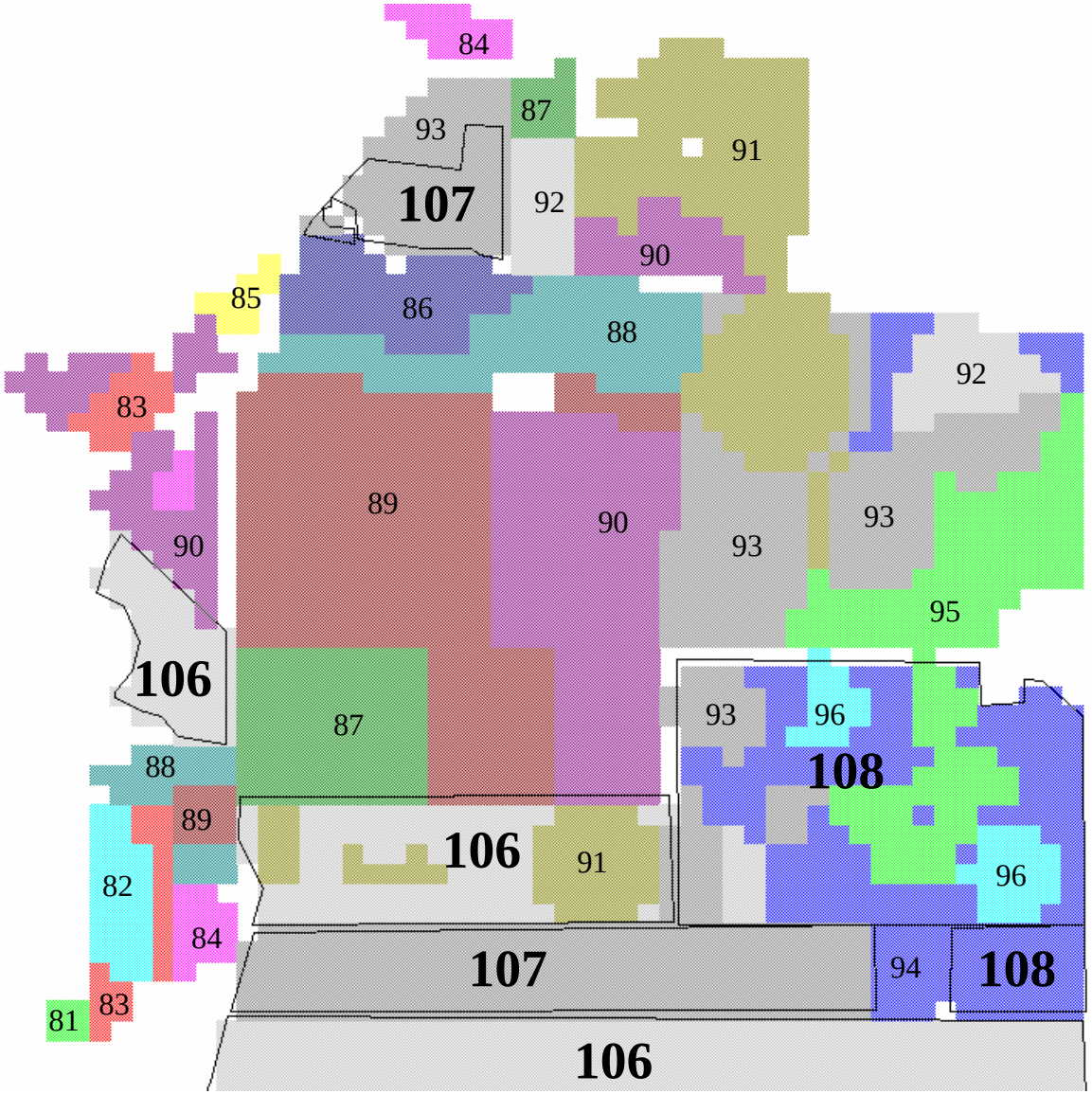
A-3 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70
Start Year	Stop Year	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96
2044	**2046**	*14235*	*14965*	100	100	100	100	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A-3 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Central Murtho Area)



A-3 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (Central Murtho Area)



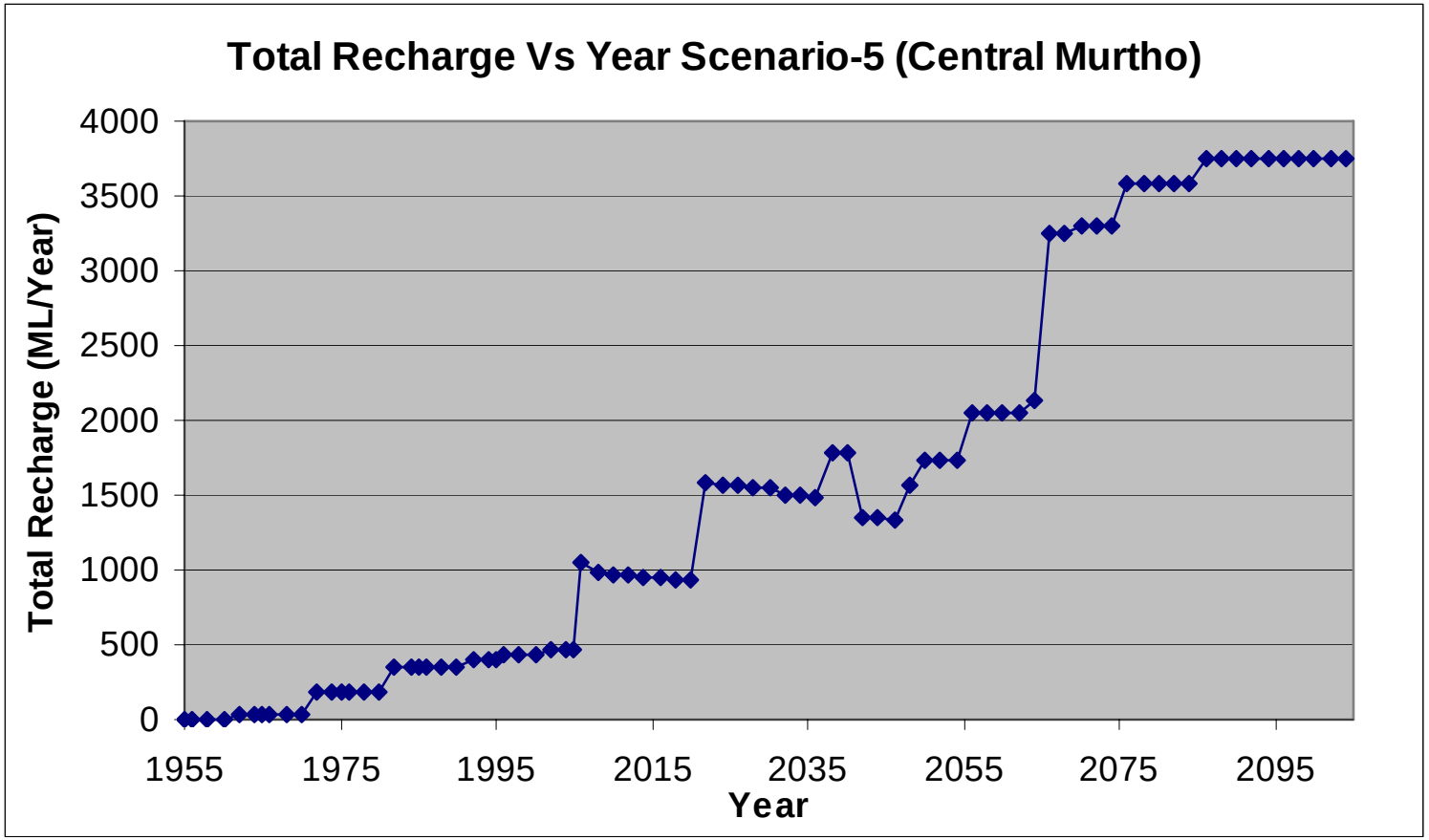
A-3 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03	2015	2015	2015
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70	50	60	70
Start Yr	Stop Yr	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96	Zone 106	Zone 107	Zone 108
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	520	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	310	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	285	325	475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	325	325	325	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	325	325	325	285	285	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	270	270	270	285	285	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	270	270	270	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	100	100	260	285	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	100	100	250	280	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	100	240	270	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	100	100	230	260	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	100	100	220	250	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	100	210	240	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	100	200	230	285	195	180	180	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	100	190	220	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	100	180	210	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	100	170	200	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	160	190	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	150	180	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	140	170	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	130	160	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	120	150	285	195	180	180	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	110	140	285	195	180	180	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	130	285	195	180	180	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	120	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	110	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

A-3 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Central Murtho Area)

Irrigation Start year				1950	1960	1940-70	1940-80	1950	1950	1960	1960-70	1970-80	1980-95	1990-00	1997-03	1990-03	1997-03	1999-03	1999-03	2015	2015	2015
Lag time (yrs)				10	10	10-45	10-50	45	50	45	40-50	40-50	45-50	45-55	45-60	50-65	60-65	65	70	50	60	70
Start Yr	Stop Yr	Start Day	Stop Day	Zone 81	Zone 82	Zone 83	Zone 84	Zone 85	Zone 86	Zone 87	Zone 88	Zone 89	Zone 90	Zone 91	Zone 92	Zone 93	Zone 94	Zone 95	Zone 96	Zone 106	Zone 107	Zone 108
2044	**2046**	*14235*	*14965*	100	100	100	100	100	195	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	100	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	100	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A-3 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Central Murtho Area)



A-3 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (Central Murtho Area)

A-4. MODEL INPUT – SOUTH MURTHO AREA

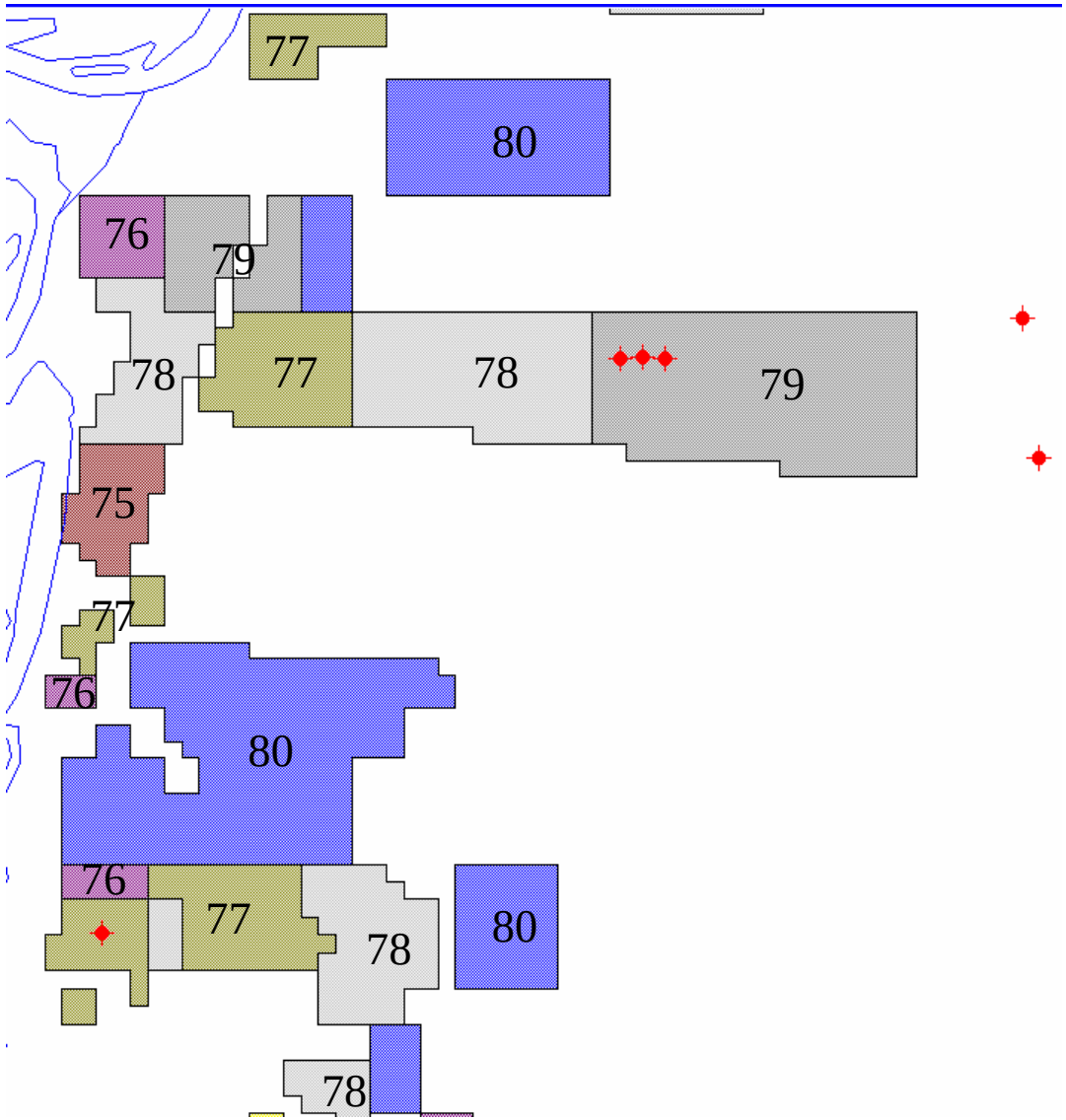
- Model recharge zones
- Drainage bore locations
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-4. Model Scenario conditions



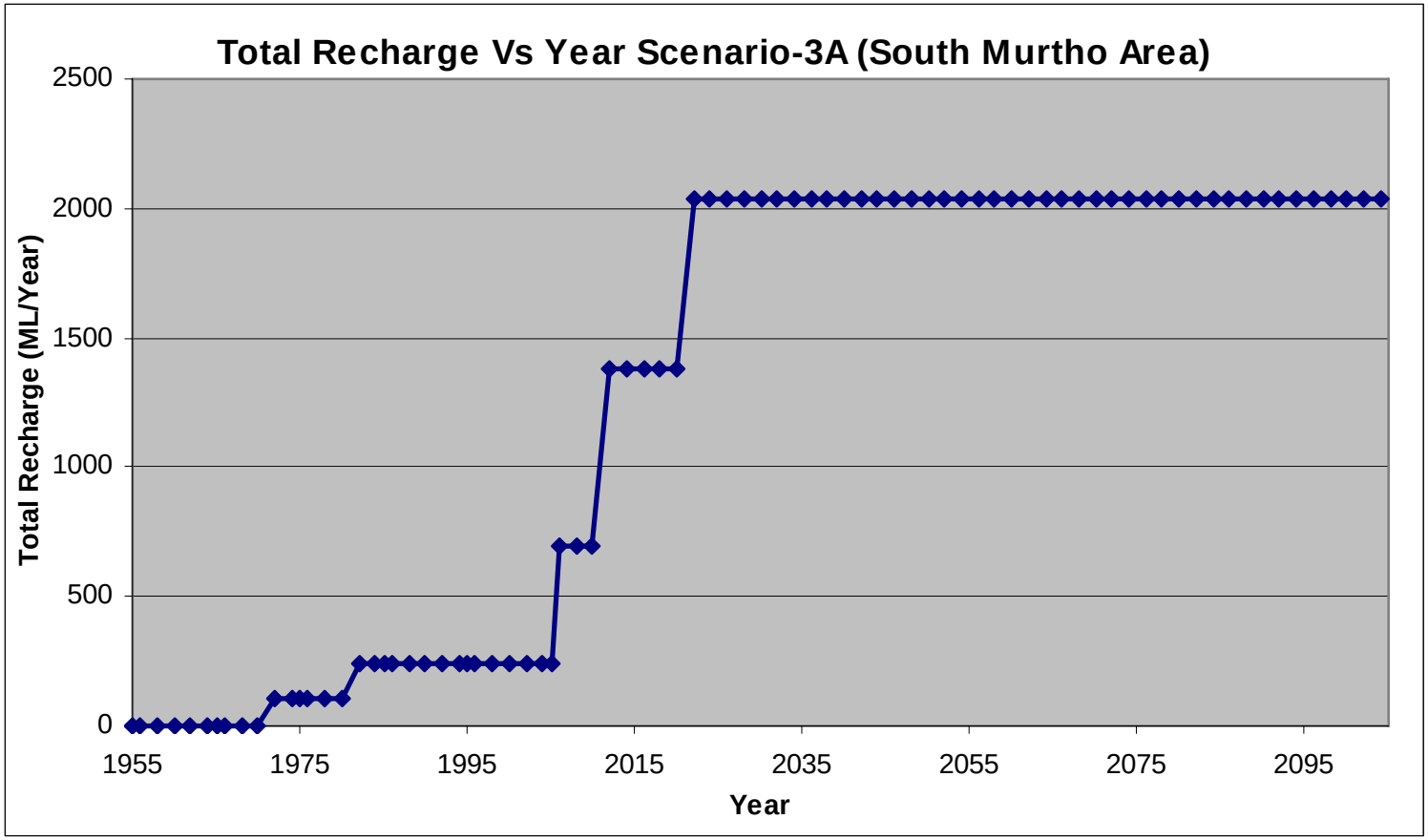
A-4. Model recharge zones and location of drainage bores in the South Murtho Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	200	200	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	200	200	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	200	200	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	200	200	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	200	200	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	200	200	200	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	200	200	200	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	200	200	200	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	200	200	200	200	0.1	0.1
2012	**2014**	*2555*	*3285*	200	200	200	200	0.1	0.1
2014	**2016**	*3285*	*4015*	200	200	200	200	0.1	0.1
2016	**2018**	*4015*	*4745*	200	200	200	200	0.1	0.1
2018	**2020**	*4745*	*5475*	200	200	200	200	0.1	0.1
2020	**2022**	*5475*	*6205*	200	200	200	200	200	0.1
2022	**2024**	*6205*	*6935*	200	200	200	200	200	0.1
2024	**2026**	*6935*	*7665*	200	200	200	200	200	0.1
2026	**2028**	*7665*	*8395*	200	200	200	200	200	0.1
2028	**2030**	*8395*	*9125*	200	200	200	200	200	0.1
2030	**2032**	*9125*	*9855*	200	200	200	200	200	0.1
2032	**2034**	*9855*	*10585*	200	200	200	200	200	0.1
2034	**2036**	*10585*	*11315*	200	200	200	200	200	0.1
2036	**2038**	*11315*	*12045*	200	200	200	200	200	0.1
2038	**2040**	*12045*	*12775*	200	200	200	200	200	0.1
2040	**2042**	*12775*	*13505*	200	200	200	200	200	0.1
2042	**2044**	*13505*	*14235*	200	200	200	200	200	0.1

A-4 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
2044	**2046**	*14235*	*14965*	200	200	200	200	200	0.1
2046	**2048**	*14965*	*15695*	200	200	200	200	200	0.1
2048	**2050**	*15695*	*16425*	200	200	200	200	200	0.1
2050	**2052**	*16425*	*17155*	200	200	200	200	200	0.1
2052	**2054**	*17155*	*17885*	200	200	200	200	200	0.1
2054	**2056**	*17885*	*18615*	200	200	200	200	200	0.1
2056	**2058**	*18615*	*19345*	200	200	200	200	200	0.1
2058	**2060**	*19345*	*20075*	200	200	200	200	200	0.1
2060	**2062**	*20075*	*20805*	200	200	200	200	200	0.1
2062	**2064**	*20805*	*21535*	200	200	200	200	200	0.1
2064	**2066**	*21535*	*22265*	200	200	200	200	200	0.1
2066	**2068**	*22265*	*22995*	200	200	200	200	200	0.1
2068	**2070**	*22995*	*23725*	200	200	200	200	200	0.1
2070	**2072**	*23725*	*24455*	200	200	200	200	200	0.1
2072	**2074**	*24455*	*25185*	200	200	200	200	200	0.1
2074	**2076**	*25185*	*25915*	200	200	200	200	200	0.1
2076	**2078**	*25915*	*26645*	200	200	200	200	200	0.1
2078	**2080**	*26645*	*27375*	200	200	200	200	200	0.1
2080	**2082**	*27375*	*28105*	200	200	200	200	200	0.1
2082	**2084**	*28105*	*28835*	200	200	200	200	200	0.1
2084	**2086**	*28835*	*29565*	200	200	200	200	200	0.1
2086	**2088**	*29565*	*30295*	200	200	200	200	200	0.1
2088	**2090**	*30295*	*31025*	200	200	200	200	200	0.1
2090	**2092**	*31025*	*31755*	200	200	200	200	200	0.1
2092	**2094**	*31755*	*32485*	200	200	200	200	200	0.1
2094	**2096**	*32485*	*33215*	200	200	200	200	200	0.1
2096	**2098**	*33215*	*33945*	200	200	200	200	200	0.1
2098	**2100**	*33945*	*34675*	200	200	200	200	200	0.1
2100	**2102**	*34675*	*35405*	200	200	200	200	200	0.1
2102	**2104**	*35405*	*36135*	200	200	200	200	200	0.1

A-4 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (South Murtho Area)



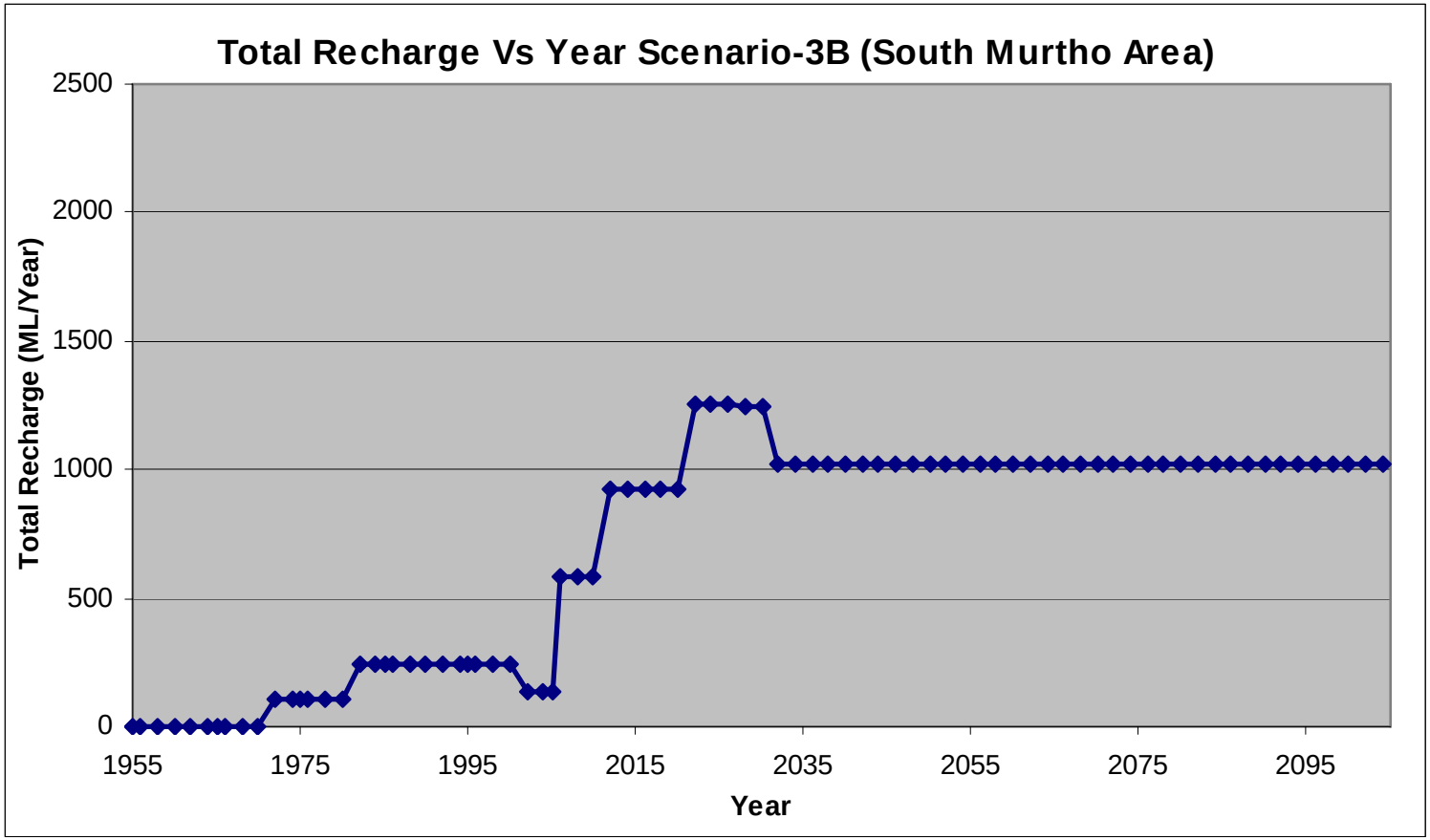
A-4 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	200	200	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	200	200	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	200	200	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	200	200	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	120	100	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	120	100	200	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	120	100	200	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	120	100	200	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	120	100	200	100	0.1	0.1
2012	**2014**	*2555*	*3285*	120	100	200	100	0.1	0.1
2014	**2016**	*3285*	*4015*	120	100	200	100	0.1	0.1
2016	**2018**	*4015*	*4745*	120	100	200	100	0.1	0.1
2018	**2020**	*4745*	*5475*	120	100	200	100	0.1	0.1
2020	**2022**	*5475*	*6205*	120	100	200	100	100	0.1
2022	**2024**	*6205*	*6935*	120	100	200	100	100	0.1
2024	**2026**	*6935*	*7665*	120	100	200	100	100	0.1
2026	**2028**	*7665*	*8395*	100	100	200	100	100	0.1
2028	**2030**	*8395*	*9125*	100	100	200	100	100	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	100	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	100	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	0.1

A-4 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
2044	**2046**	*14235*	*14965*	100	100	100	100	100	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	0.1
2086	**2088**	*29565*	*30295*	100	100	100	100	100	0.1
2088	**2090**	*30295*	*31025*	100	100	100	100	100	0.1
2090	**2092**	*31025*	*31755*	100	100	100	100	100	0.1
2092	**2094**	*31755*	*32485*	100	100	100	100	100	0.1
2094	**2096**	*32485*	*33215*	100	100	100	100	100	0.1
2096	**2098**	*33215*	*33945*	100	100	100	100	100	0.1
2098	**2100**	*33945*	*34675*	100	100	100	100	100	0.1
2100	**2102**	*34675*	*35405*	100	100	100	100	100	0.1
2102	**2104**	*35405*	*36135*	100	100	100	100	100	0.1

A-4 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (South Murtho Area)



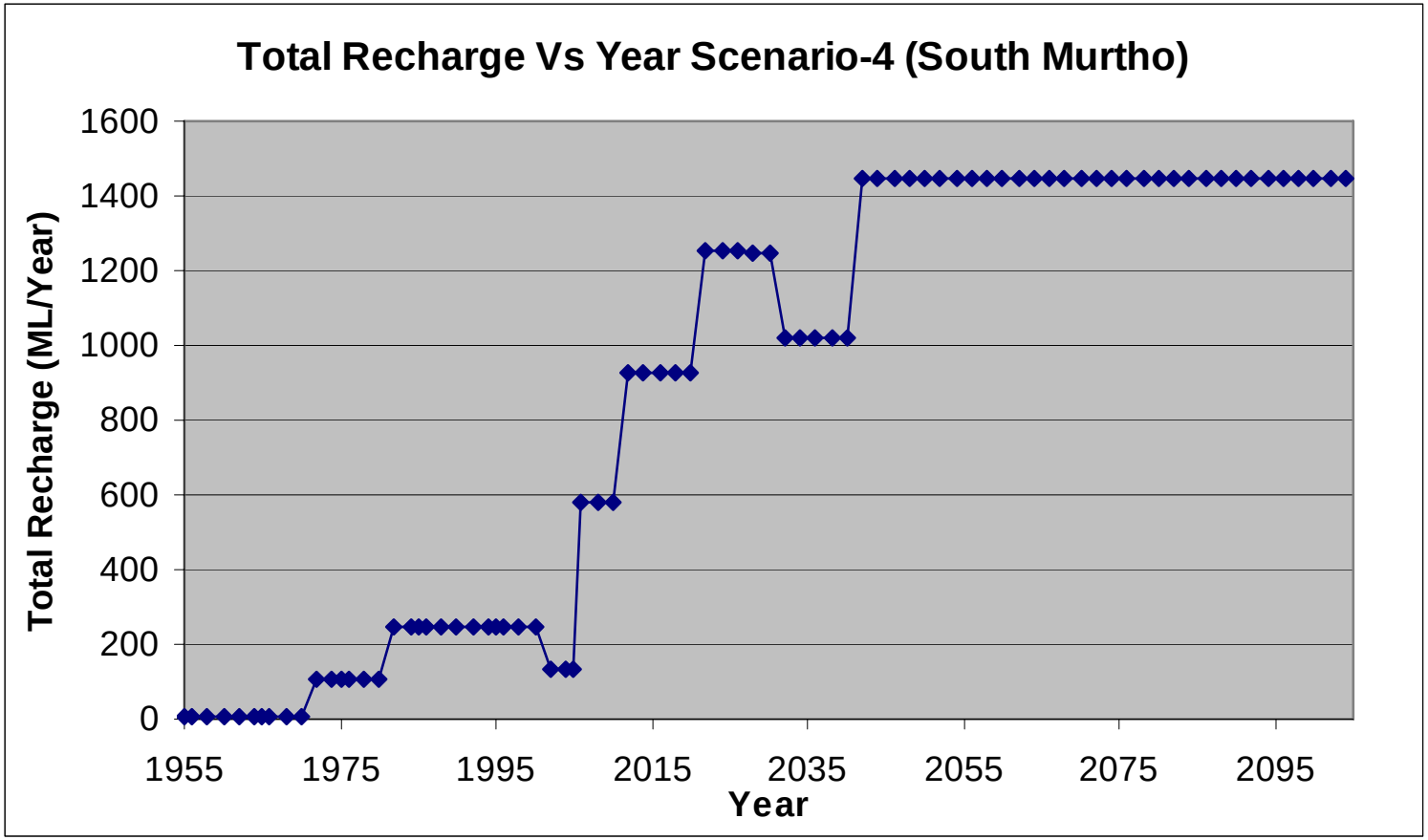
A-4 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	200	200	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	200	200	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	200	200	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	200	200	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	120	100	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	120	100	200	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	120	100	200	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	120	100	200	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	120	100	200	100	0.1	0.1
2012	**2014**	*2555*	*3285*	120	100	200	100	0.1	0.1
2014	**2016**	*3285*	*4015*	120	100	200	100	0.1	0.1
2016	**2018**	*4015*	*4745*	120	100	200	100	0.1	0.1
2018	**2020**	*4745*	*5475*	120	100	200	100	0.1	0.1
2020	**2022**	*5475*	*6205*	120	100	200	100	100	0.1
2022	**2024**	*6205*	*6935*	120	100	200	100	100	0.1
2024	**2026**	*6935*	*7665*	120	100	200	100	100	0.1
2026	**2028**	*7665*	*8395*	100	100	200	100	100	0.1
2028	**2030**	*8395*	*9125*	100	100	200	100	100	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	100	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	100	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	100
2042	**2044**	*13505*	*14235*	100	100	100	100	100	100

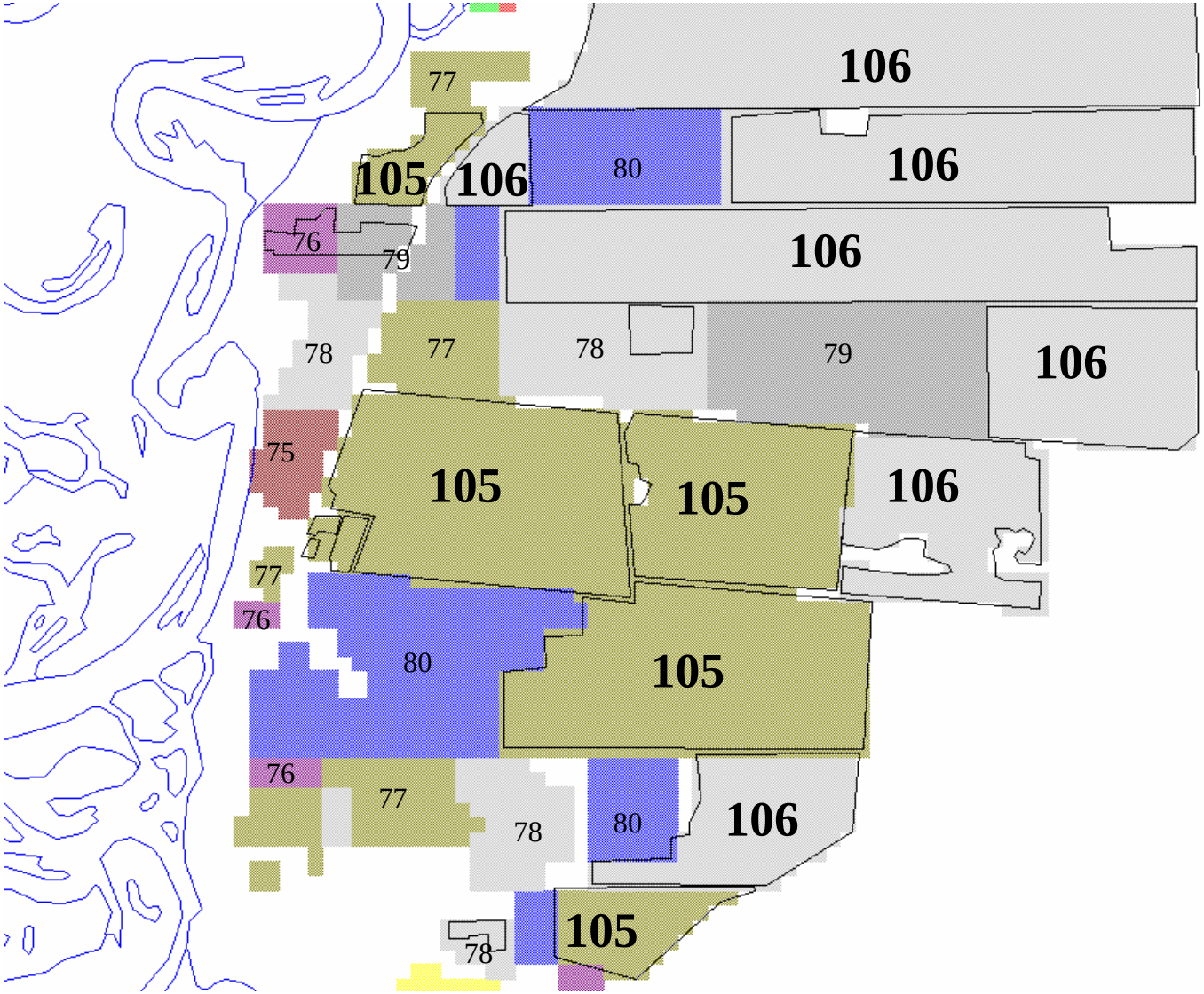
A-4 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03
Lag time (yrs)				30	30-35	30-40	35-40	40	40
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100

A-4 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (South Murtho Area)



A-4 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (South Murtho Area)



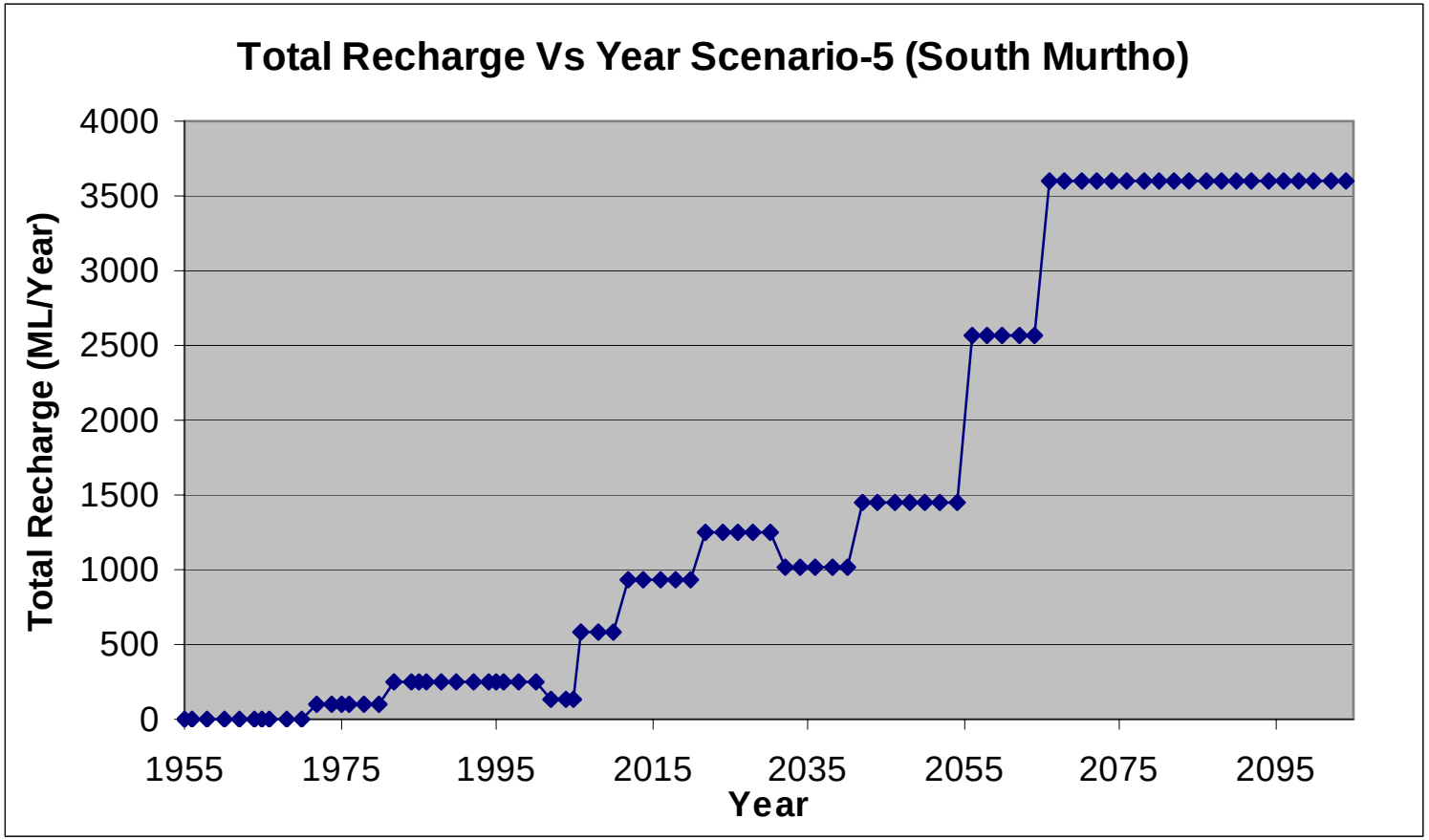
A-4 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03	2015	2015
Lag time (yrs)				30	30-35	30-40	35-40	40	40	40	50
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80	Zone 105	Zone 106
1955	1960	0	1825	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	1970	3650	5475	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	1975	5475	7300	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	1980	7300	9125	200	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	1985	9125	10950	200	200	0.1	0.1	0.1	0.1	0.1	0.1
1985	1990	10950	12775	200	200	0.1	0.1	0.1	0.1	0.1	0.1
1990	1995	12775	14600	200	200	0.1	0.1	0.1	0.1	0.1	0.1
1995	2000	14600	16425	200	200	0.1	0.1	0.1	0.1	0.1	0.1
2000	2005	16425	18250	120	100	0.1	0.1	0.1	0.1	0.1	0.1
2005	2006	0	365	120	100	200	0.1	0.1	0.1	0.1	0.1
2006	2008	365	1095	120	100	200	0.1	0.1	0.1	0.1	0.1
2008	2010	1095	1825	120	100	200	0.1	0.1	0.1	0.1	0.1
2010	2012	1825	2555	120	100	200	100	0.1	0.1	0.1	0.1
2012	2014	2555	3285	120	100	200	100	0.1	0.1	0.1	0.1
2014	2016	3285	4015	120	100	200	100	0.1	0.1	0.1	0.1
2016	2018	4015	4745	120	100	200	100	0.1	0.1	0.1	0.1
2018	2020	4745	5475	120	100	200	100	0.1	0.1	0.1	0.1
2020	2022	5475	6205	120	100	200	100	100	0.1	0.1	0.1
2022	2024	6205	6935	120	100	200	100	100	0.1	0.1	0.1
2024	2026	6935	7665	120	100	200	100	100	0.1	0.1	0.1
2026	2028	7665	8395	100	100	200	100	100	0.1	0.1	0.1
2028	2030	8395	9125	100	100	200	100	100	0.1	0.1	0.1
2030	2032	9125	9855	100	100	100	100	100	0.1	0.1	0.1
2032	2034	9855	10585	100	100	100	100	100	0.1	0.1	0.1
2034	2036	10585	11315	100	100	100	100	100	0.1	0.1	0.1
2036	2038	11315	12045	100	100	100	100	100	0.1	0.1	0.1
2038	2040	12045	12775	100	100	100	100	100	0.1	0.1	0.1
2040	2042	12775	13505	100	100	100	100	100	100	0.1	0.1
2042	2044	13505	14235	100	100	100	100	100	100	0.1	0.1

A-4 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (South Murtho Area)

Irrigation Start year				1940	1950	1960-70	1970-80	1980	2000-03	2015	2015
Lag time (yrs)				30	30-35	30-40	35-40	40	40	40	50
Start Year	Stop Year	Start Day	Stop Day	Zone 75	Zone 76	Zone 77	Zone 78	Zone 79	Zone 80	Zone 105	Zone 106
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100

A-4 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (South Murtho Area)



A-4 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (South Murtho Area)

A-5. MODEL INPUT – UPPER PIKE AREA

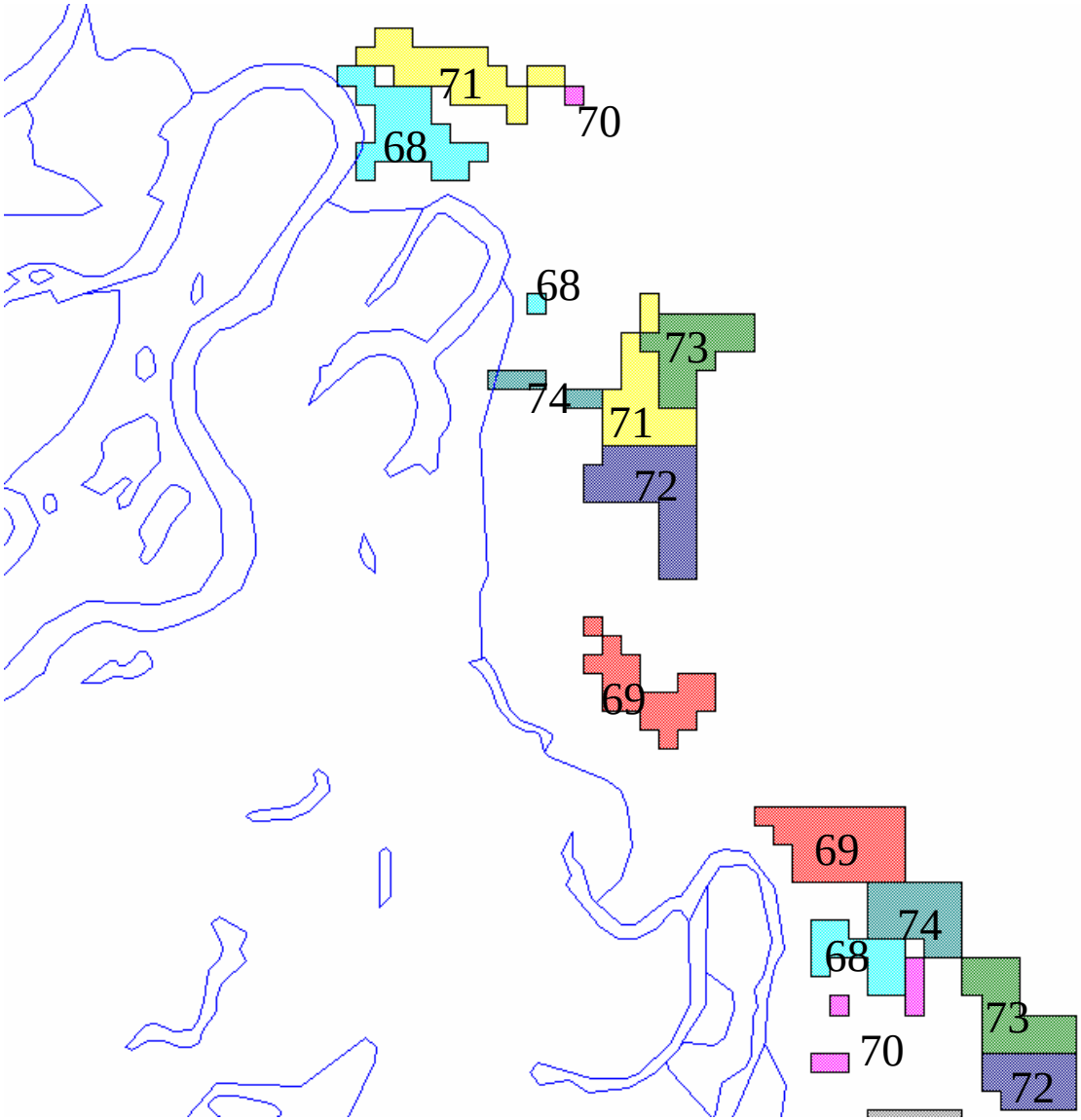
- Model recharge zones
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-5. Model Scenario conditions



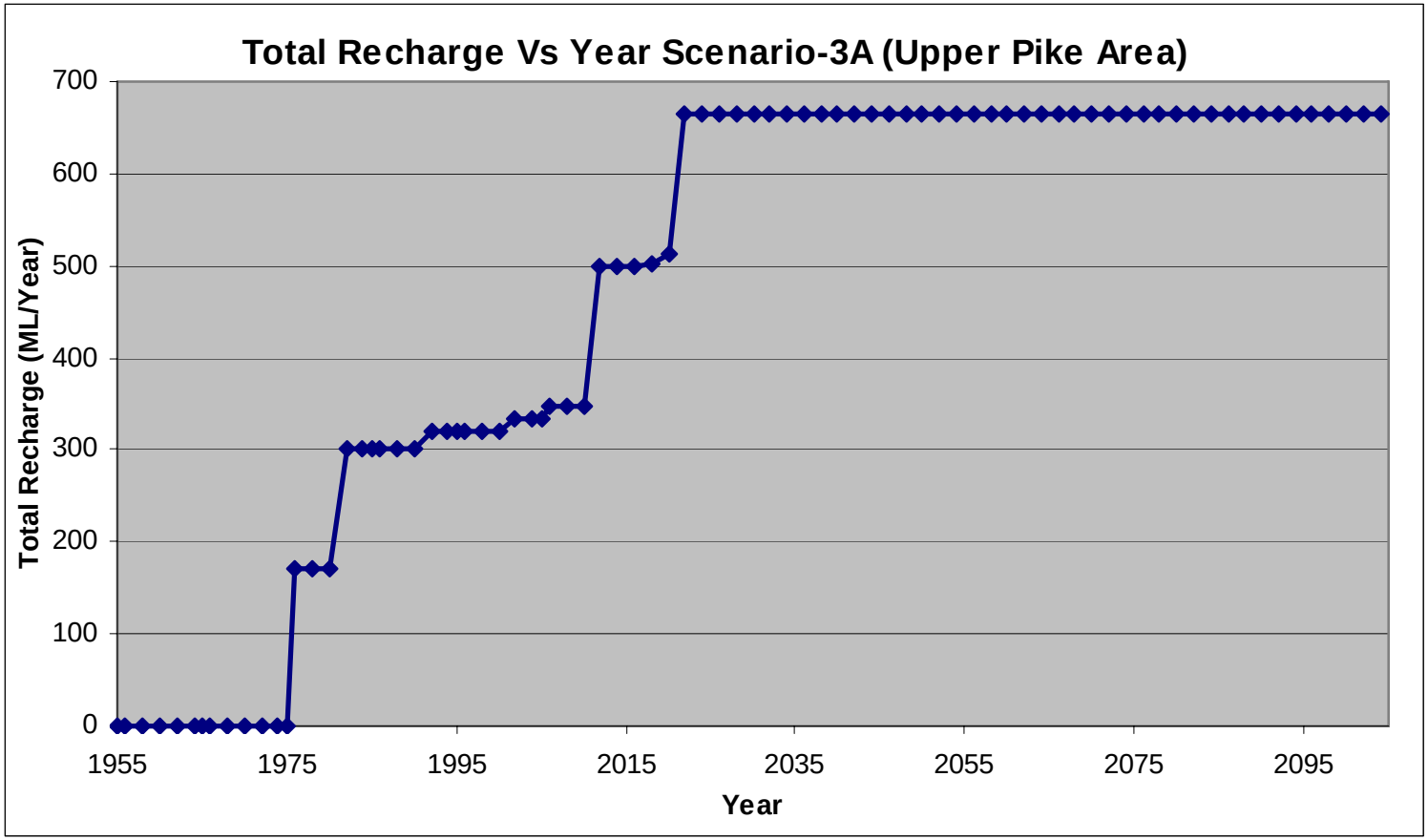
A-5. Model recharge zones in the Upper Pike Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	305	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	235	235	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	235	235	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	250	250	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	250	250	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	250	250	110	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	250	250	235	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	250	250	235	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	250	250	235	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	250	250	235	235	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	250	250	235	235	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	250	250	235	235	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	250	250	250	235	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	250	250	250	250	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	250	250	250	250	250	0.1	0.1
2022	**2024**	*6205*	*6935*	250	250	250	250	250	0.1	0.1
2024	**2026**	*6935*	*7665*	250	250	250	250	250	0.1	0.1
2026	**2028**	*7665*	*8395*	250	250	250	250	250	0.1	0.1
2028	**2030**	*8395*	*9125*	250	250	250	250	250	0.1	0.1
2030	**2032**	*9125*	*9855*	250	250	250	250	250	0.1	0.1
2032	**2034**	*9855*	*10585*	250	250	250	250	250	0.1	0.1
2034	**2036**	*10585*	*11315*	250	250	250	250	250	0.1	0.1
2036	**2038**	*11315*	*12045*	250	250	250	250	250	0.1	0.1
2038	**2040**	*12045*	*12775*	250	250	250	250	250	0.1	0.1
2040	**2042**	*12775*	*13505*	250	250	250	250	250	0.1	0.1
2042	**2044**	*13505*	*14235*	250	250	250	250	250	0.1	0.1

A-5 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
2044	**2046**	*14235*	*14965*	250	250	250	250	250	0.1	0.1
2046	**2048**	*14965*	*15695*	250	250	250	250	250	0.1	0.1
2048	**2050**	*15695*	*16425*	250	250	250	250	250	0.1	0.1
2050	**2052**	*16425*	*17155*	250	250	250	250	250	0.1	0.1
2052	**2054**	*17155*	*17885*	250	250	250	250	250	0.1	0.1
2054	**2056**	*17885*	*18615*	250	250	250	250	250	0.1	0.1
2056	**2058**	*18615*	*19345*	250	250	250	250	250	0.1	0.1
2058	**2060**	*19345*	*20075*	250	250	250	250	250	0.1	0.1
2060	**2062**	*20075*	*20805*	250	250	250	250	250	0.1	0.1
2062	**2064**	*20805*	*21535*	250	250	250	250	250	0.1	0.1
2064	**2066**	*21535*	*22265*	250	250	250	250	250	0.1	0.1
2066	**2068**	*22265*	*22995*	250	250	250	250	250	0.1	0.1
2068	**2070**	*22995*	*23725*	250	250	250	250	250	0.1	0.1
2070	**2072**	*23725*	*24455*	250	250	250	250	250	0.1	0.1
2072	**2074**	*24455*	*25185*	250	250	250	250	250	0.1	0.1
2074	**2076**	*25185*	*25915*	250	250	250	250	250	0.1	0.1
2076	**2078**	*25915*	*26645*	250	250	250	250	250	0.1	0.1
2078	**2080**	*26645*	*27375*	250	250	250	250	250	0.1	0.1
2080	**2082**	*27375*	*28105*	250	250	250	250	250	0.1	0.1
2082	**2084**	*28105*	*28835*	250	250	250	250	250	0.1	0.1
2084	**2086**	*28835*	*29565*	250	250	250	250	250	0.1	0.1
2086	**2088**	*29565*	*30295*	250	250	250	250	250	0.1	0.1
2088	**2090**	*30295*	*31025*	250	250	250	250	250	0.1	0.1
2090	**2092**	*31025*	*31755*	250	250	250	250	250	0.1	0.1
2092	**2094**	*31755*	*32485*	250	250	250	250	250	0.1	0.1
2094	**2096**	*32485*	*33215*	250	250	250	250	250	0.1	0.1
2096	**2098**	*33215*	*33945*	250	250	250	250	250	0.1	0.1
2098	**2100**	*33945*	*34675*	250	250	250	250	250	0.1	0.1
2100	**2102**	*34675*	*35405*	250	250	250	250	250	0.1	0.1
2102	**2104**	*35405*	*36135*	250	250	250	250	250	0.1	0.1

A-5 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Upper Pike Area)



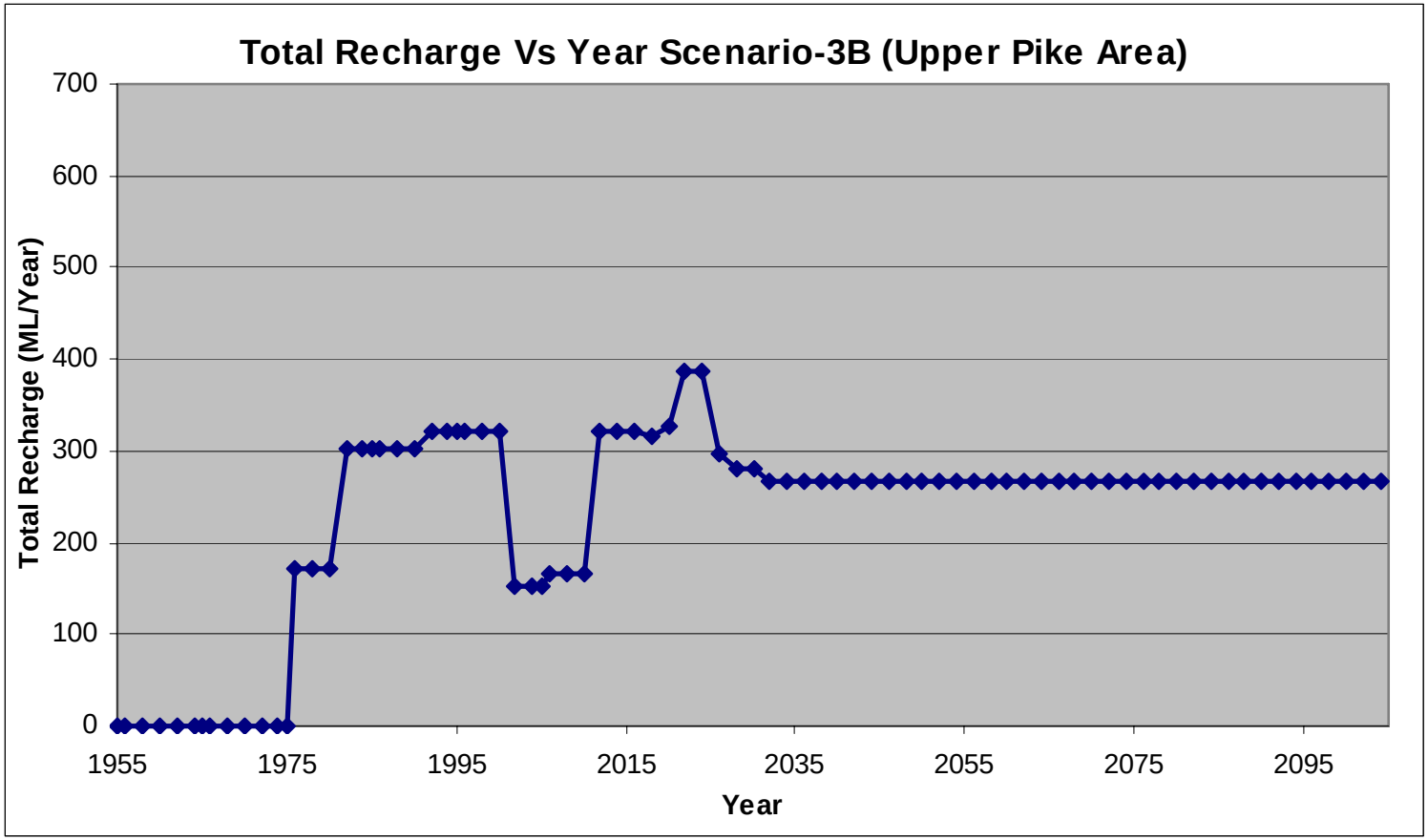
A-5 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	305	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	235	235	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	235	235	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	250	250	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	250	250	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	110	110	110	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	110	110	235	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	110	110	235	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	110	110	235	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	110	110	235	235	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	110	110	235	235	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	110	110	235	235	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	110	250	235	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	110	250	250	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	110	250	250	100	0.1	0.1
2022	**2024**	*6205*	*6935*	100	110	250	250	100	0.1	0.1
2024	**2026**	*6935*	*7665*	100	110	250	110	100	0.1	0.1
2026	**2028**	*7665*	*8395*	100	110	110	110	100	0.1	0.1
2028	**2030**	*8395*	*9125*	100	110	110	110	100	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	110	100	100	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	110	100	100	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	110	100	100	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	0.1	0.1

A-5 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
2044	**2046**	*14235*	*14965*	100	100	100	100	100	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	100	100	100	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	100	100	100	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	100	100	100	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	100	100	100	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	100	100	100	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	100	100	100	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	100	100	100	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	100	100	100	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	100	100	100	0.1	0.1

A-5 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Upper Pike Area)



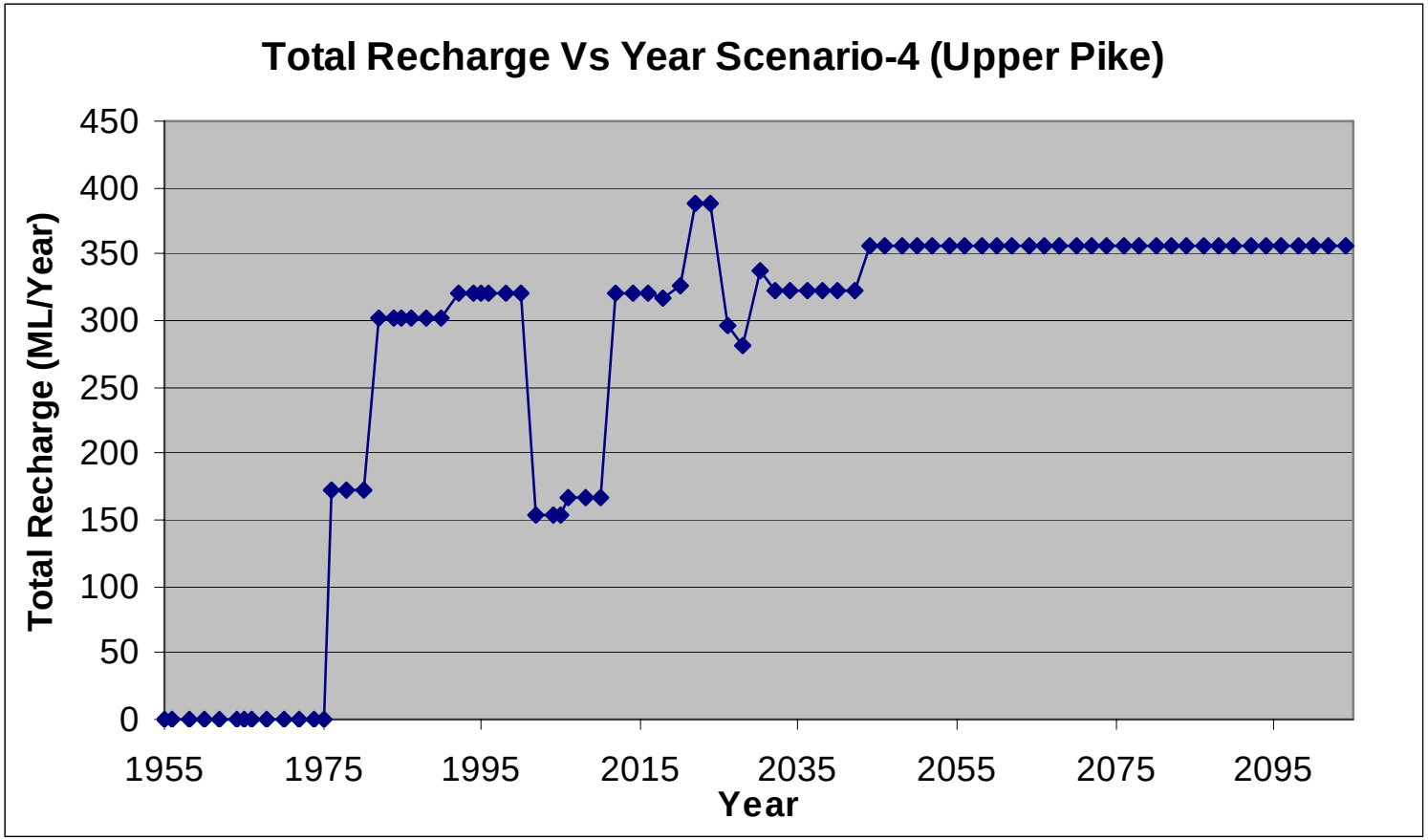
A-5 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	305	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	235	235	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	235	235	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	250	250	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	250	250	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	110	110	110	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	110	110	235	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	110	110	235	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	110	110	235	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	110	110	235	235	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	110	110	235	235	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	110	110	235	235	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	110	250	235	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	110	250	250	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	110	250	250	100	0.1	0.1
2022	**2024**	*6205*	*6935*	100	110	250	250	100	0.1	0.1
2024	**2026**	*6935*	*7665*	100	110	250	110	100	0.1	0.1
2026	**2028**	*7665*	*8395*	100	110	110	110	100	0.1	0.1
2028	**2030**	*8395*	*9125*	100	110	110	110	100	100	0.1
2030	**2032**	*9125*	*9855*	100	100	110	100	100	100	0.1
2032	**2034**	*9855*	*10585*	100	100	110	100	100	100	0.1
2034	**2036**	*10585*	*11315*	100	100	110	100	100	100	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	100	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	100	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	100	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	100	100

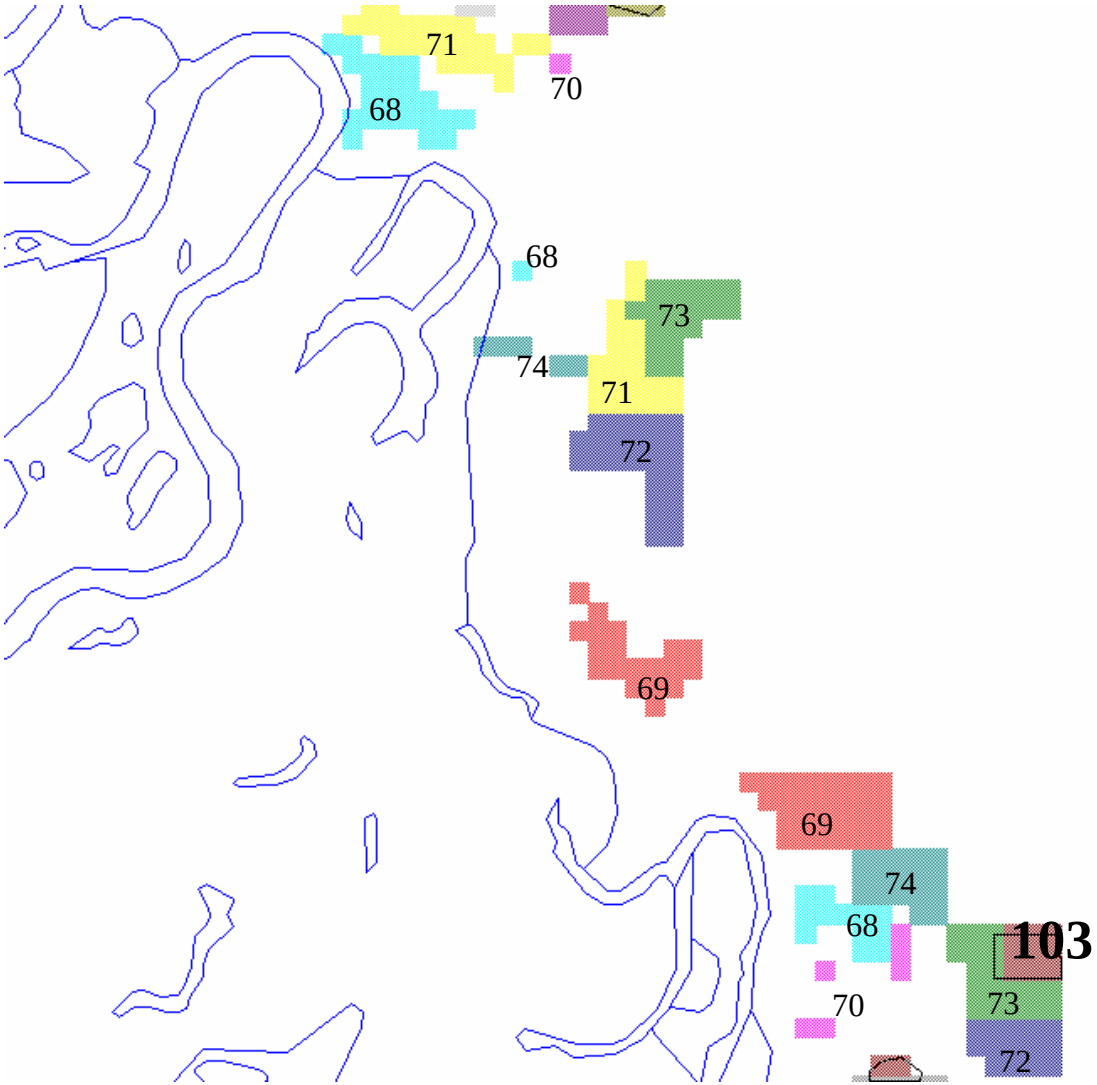
A-5 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100

A-5 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Upper Pike Area)



A-5 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (Upper Pike Area)



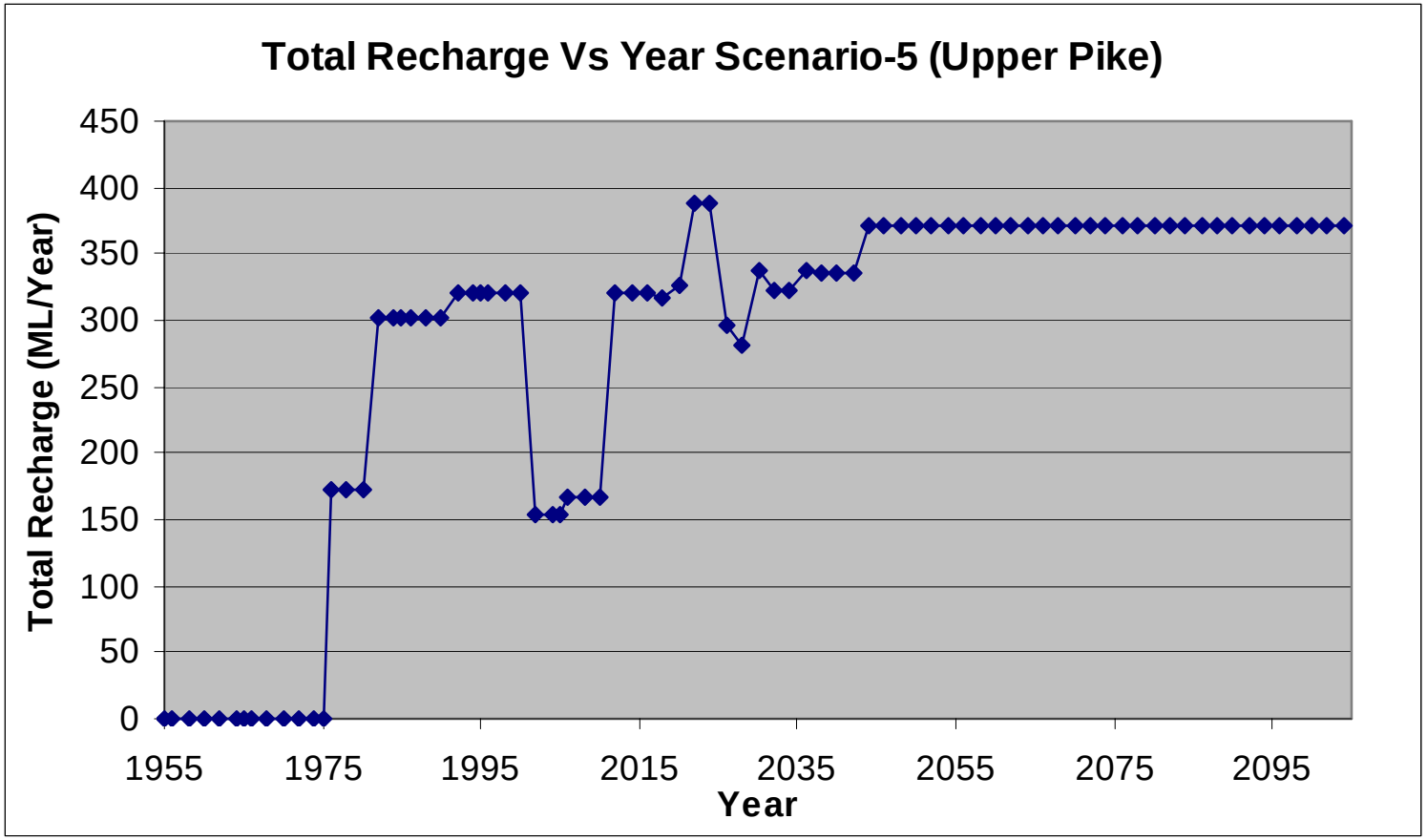
A-5 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003	2015
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45	20
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74	Zone 103
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	305	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	235	235	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	235	235	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	250	250	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	250	250	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	110	110	110	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	110	110	235	0.1	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	110	110	235	0.1	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	110	110	235	0.1	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	110	110	235	235	0.1	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	110	110	235	235	0.1	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	110	110	235	235	0.1	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	110	250	235	0.1	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	110	250	250	0.1	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	110	250	250	100	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	110	250	250	100	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	110	250	110	100	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	110	110	110	100	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	110	110	110	100	100	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	110	100	100	100	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	110	100	100	100	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	110	100	100	100	0.1	100
2036	**2038**	*11315*	*12045*	100	100	100	100	100	100	0.1	100
2038	**2040**	*12045*	*12775*	100	100	100	100	100	100	0.1	100
2040	**2042**	*12775*	*13505*	100	100	100	100	100	100	0.1	100
2042	**2044**	*13505*	*14235*	100	100	100	100	100	100	100	100

A-5 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Upper Pike Area)

Irrigation Start year				1950-60	1950	1960	1970-80	1980-00	1990-03	2003	2015
Lag time (yrs)				15-25	30-35	40	30-40	20-40	25-40	35-45	20
Start Year	Stop Year	Start Day	Stop Day	Zone 68	Zone 69	Zone 70	Zone 71	Zone 72	Zone 73	Zone 74	Zone 103
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100

A-5 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Upper Pike Area)



A-5 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (Upper Pike Area)

A-6. MODEL INPUT – MID PIKE AREA

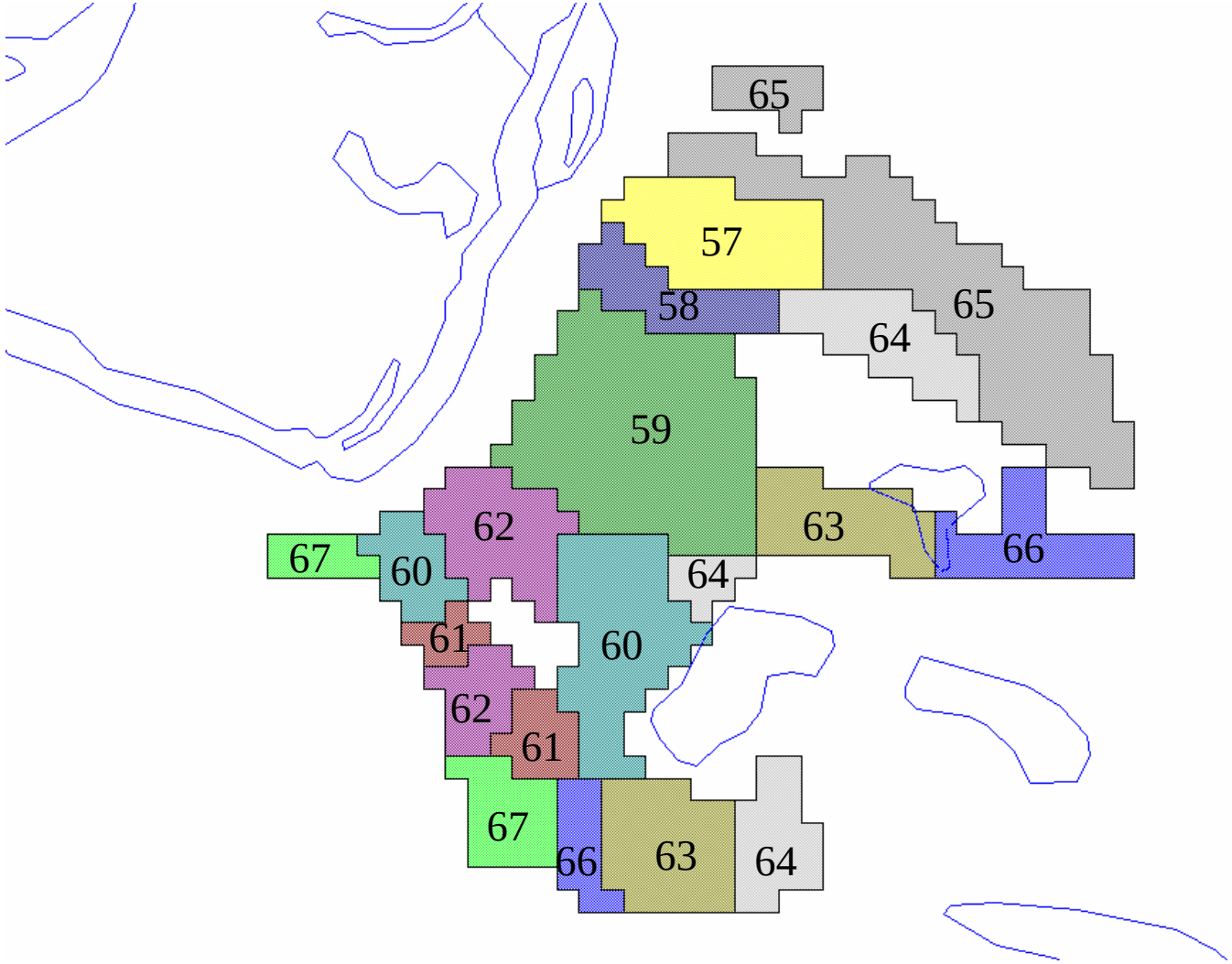
- Model recharge zones
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-6. Model Scenario conditions



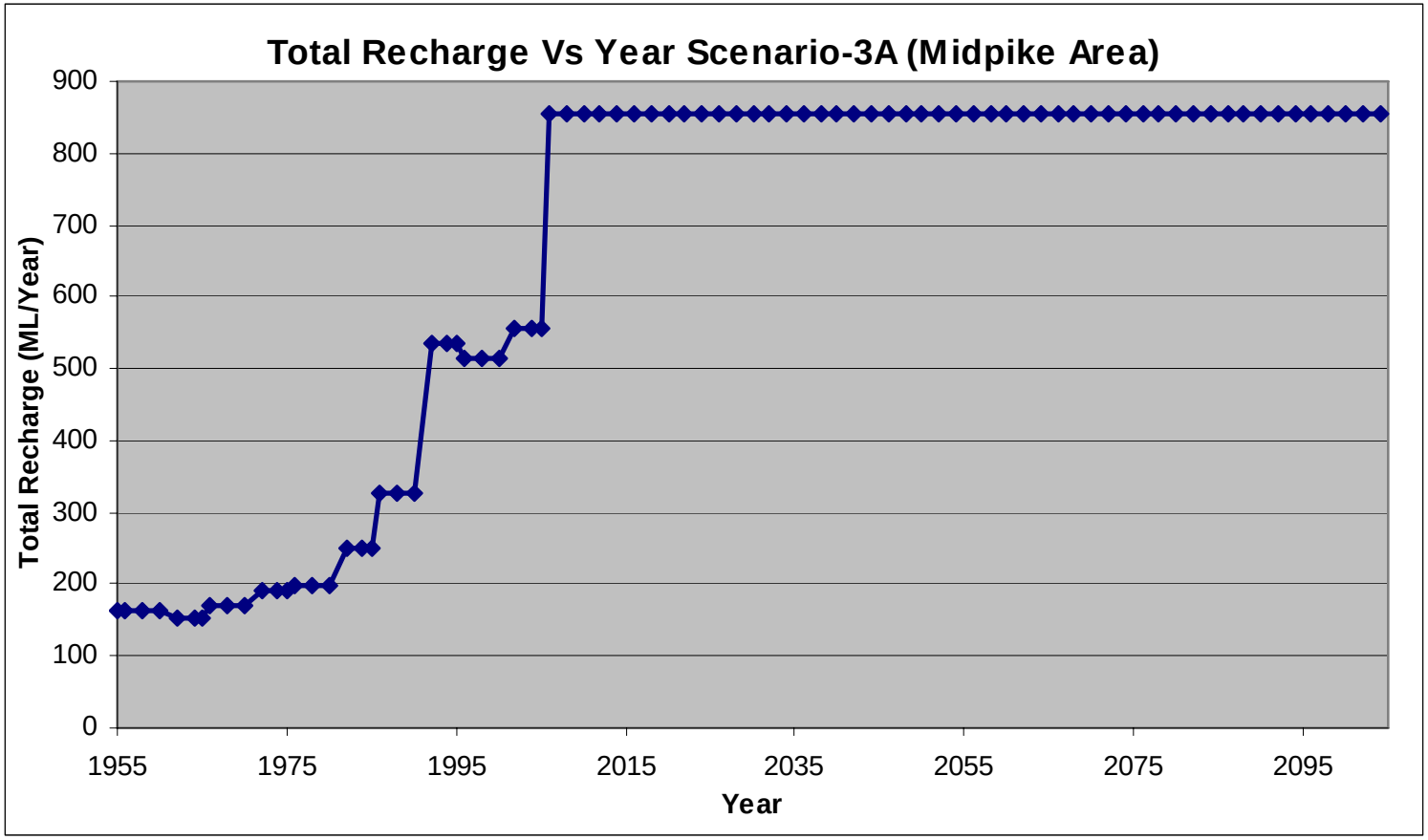
A-6. Model recharge zones in the Mid Pike Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
1955	**1960**	*0*	*1825*	240.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	200	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	165	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	180	150	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	180	150	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	180	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	150	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	150	120	165	120	0.1	60	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	150	120	165	120	120	120	120	120	0.1	0.1	0.1

A-6 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
2044	**2046**	*14235*	*14965*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	150	120	165	120	120	120	120	120	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	150	120	165	120	120	120	120	120	0.1	0.1	0.1

A-6 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Mid Pike Area)



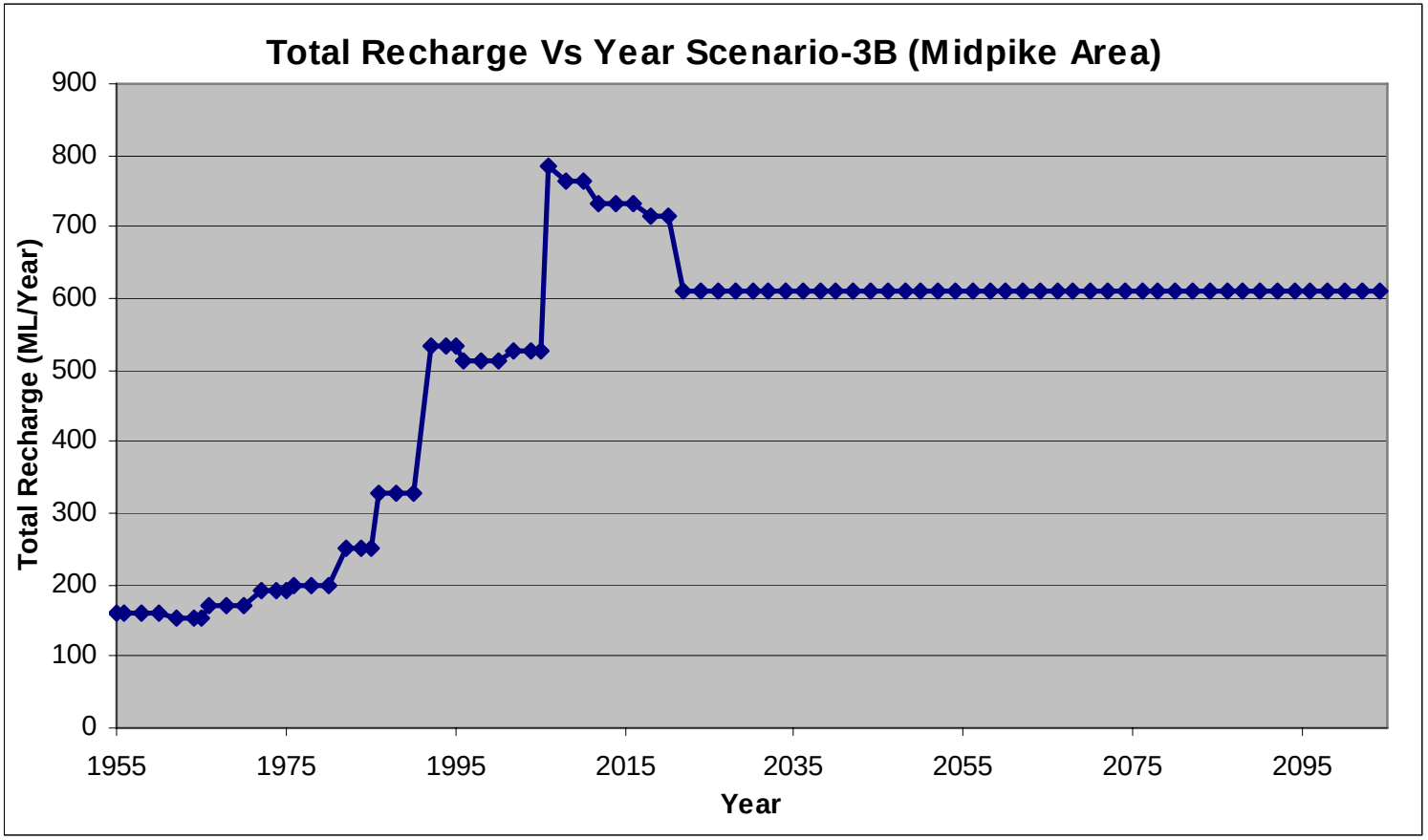
A-6 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
1955	**1960**	*0*	*1825*	240	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	200	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	165	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	180	150	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	180	150	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	180	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	150	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	120	120	160	120	0.1	60	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	120	120	160	120	120	60	120	120	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	120	120	160	120	120	60	100	120	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	120	120	160	120	120	60	100	120	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	120	160	120	120	60	100	100	0.1	0.1	0.1
2012	**2014**	*2555*	*3285*	100	120	160	120	120	60	100	100	0.1	0.1	0.1
2014	**2016**	*3285*	*4015*	100	120	160	120	120	60	100	100	0.1	0.1	0.1
2016	**2018**	*4015*	*4745*	100	120	160	100	120	60	100	100	0.1	0.1	0.1
2018	**2020**	*4745*	*5475*	100	120	160	100	120	60	100	100	0.1	0.1	0.1
2020	**2022**	*5475*	*6205*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2022	**2024**	*6205*	*6935*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2024	**2026**	*6935*	*7665*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2026	**2028**	*7665*	*8395*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2028	**2030**	*8395*	*9125*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	60	100	100	0.1	0.1	0.1

A-6 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
2044	**2046**	*14235*	*14965*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	100	100	100	60	100	100	0.1	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	100	100	100	60	100	100	0.1	0.1	0.1

A-6 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Mid Pike Area)



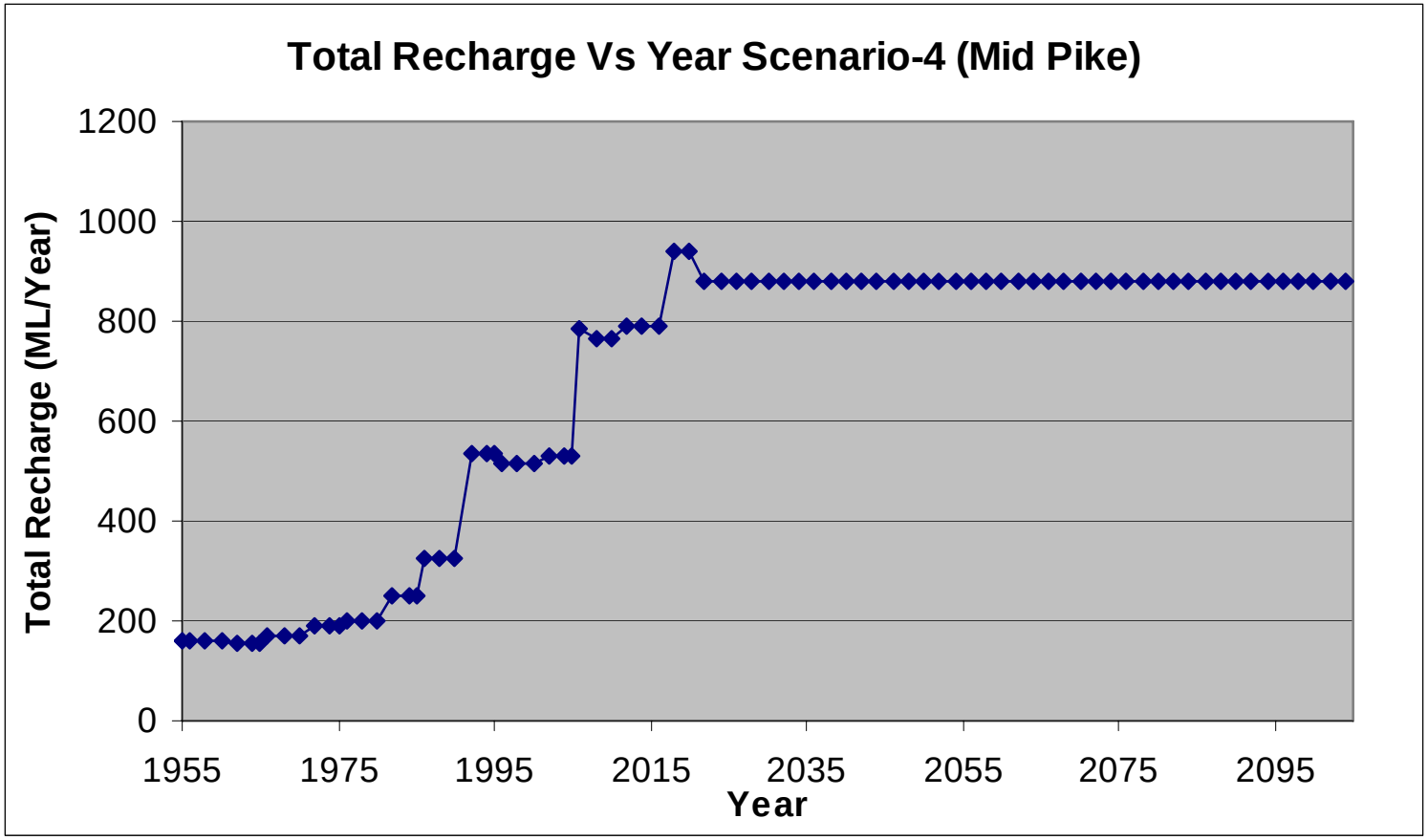
A-6 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
1955	**1960**	*0*	*1825*	240	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	200	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	165	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	180	150	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	180	150	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	180	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	150	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	120	120	160	120	0.1	60	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	120	120	160	120	120	60	120	120	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	120	120	160	120	120	60	100	120	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	120	120	160	120	120	60	100	120	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	120	160	120	120	60	100	100	0.1	100	0.1
2012	**2014**	*2555*	*3285*	100	120	160	120	120	60	100	100	0.1	100	0.1
2014	**2016**	*3285*	*4015*	100	120	160	120	120	60	100	100	0.1	100	0.1
2016	**2018**	*4015*	*4745*	100	120	160	100	120	60	100	100	100	100	0.1
2018	**2020**	*4745*	*5475*	100	120	160	100	120	60	100	100	100	100	0.1
2020	**2022**	*5475*	*6205*	100	100	100	100	100	60	100	100	100	100	100
2022	**2024**	*6205*	*6935*	100	100	100	100	100	60	100	100	100	100	100
2024	**2026**	*6935*	*7665*	100	100	100	100	100	60	100	100	100	100	100
2026	**2028**	*7665*	*8395*	100	100	100	100	100	60	100	100	100	100	100
2028	**2030**	*8395*	*9125*	100	100	100	100	100	60	100	100	100	100	100
2030	**2032**	*9125*	*9855*	100	100	100	100	100	60	100	100	100	100	100
2032	**2034**	*9855*	*10585*	100	100	100	100	100	60	100	100	100	100	100
2034	**2036**	*10585*	*11315*	100	100	100	100	100	60	100	100	100	100	100
2036	**2038**	*11315*	*12045*	100	100	100	100	100	60	100	100	100	100	100
2038	**2040**	*12045*	*12775*	100	100	100	100	100	60	100	100	100	100	100
2040	**2042**	*12775*	*13505*	100	100	100	100	100	60	100	100	100	100	100
2042	**2044**	*13505*	*14235*	100	100	100	100	100	60	100	100	100	100	100

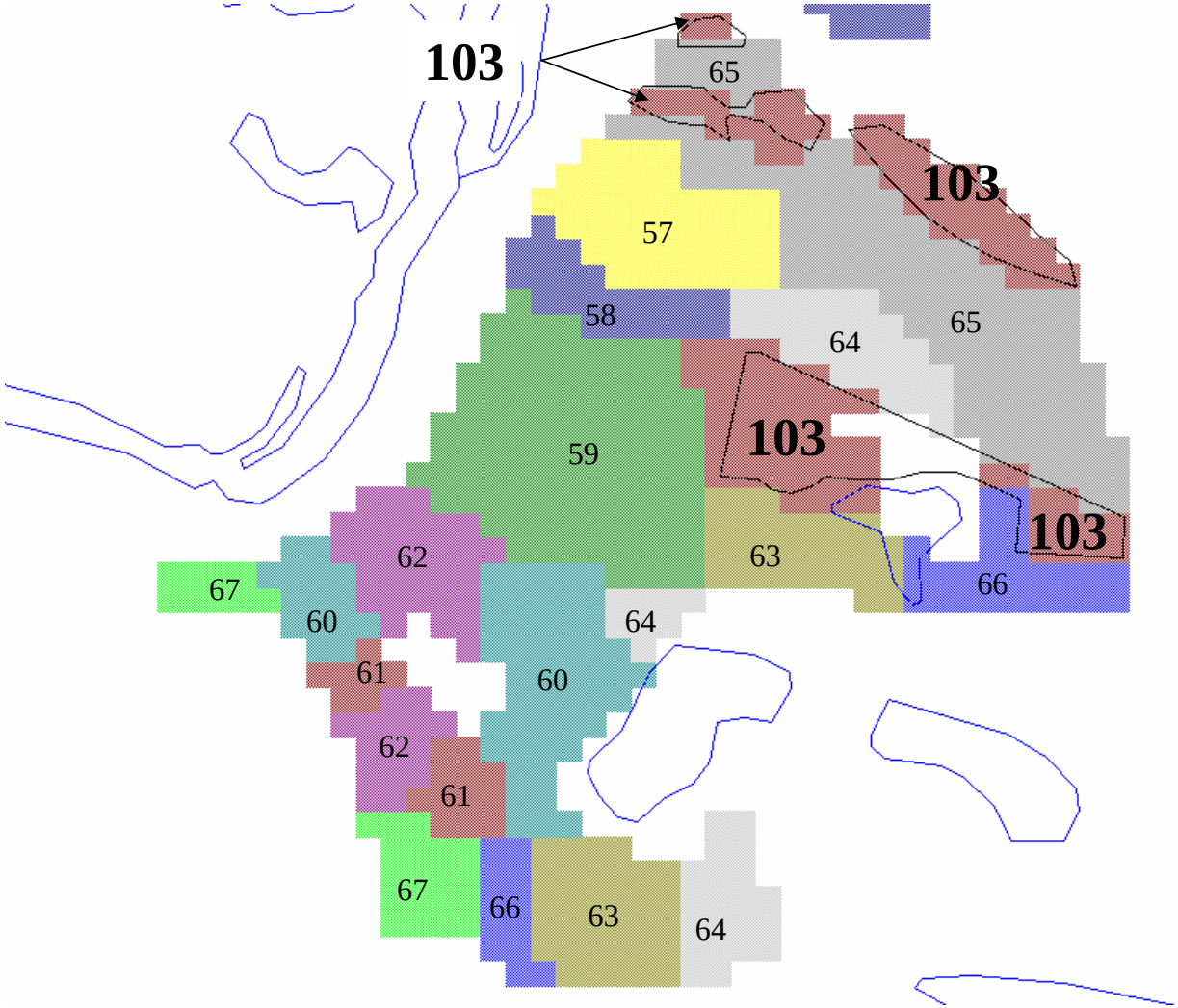
A-6 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67
2044	**2046**	*14235*	*14965*	100	100	100	100	100	60	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	60	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	60	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	60	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	60	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	60	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	60	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	60	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	60	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	60	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	60	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	60	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	60	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	60	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	60	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	60	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	60	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	60	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	60	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	60	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	60	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	60	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	60	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	60	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	60	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	60	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	60	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	60	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	60	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	60	100	100	100	100	100

A-6 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Mid Pike Area)



A-6 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (Mid Pike Area)



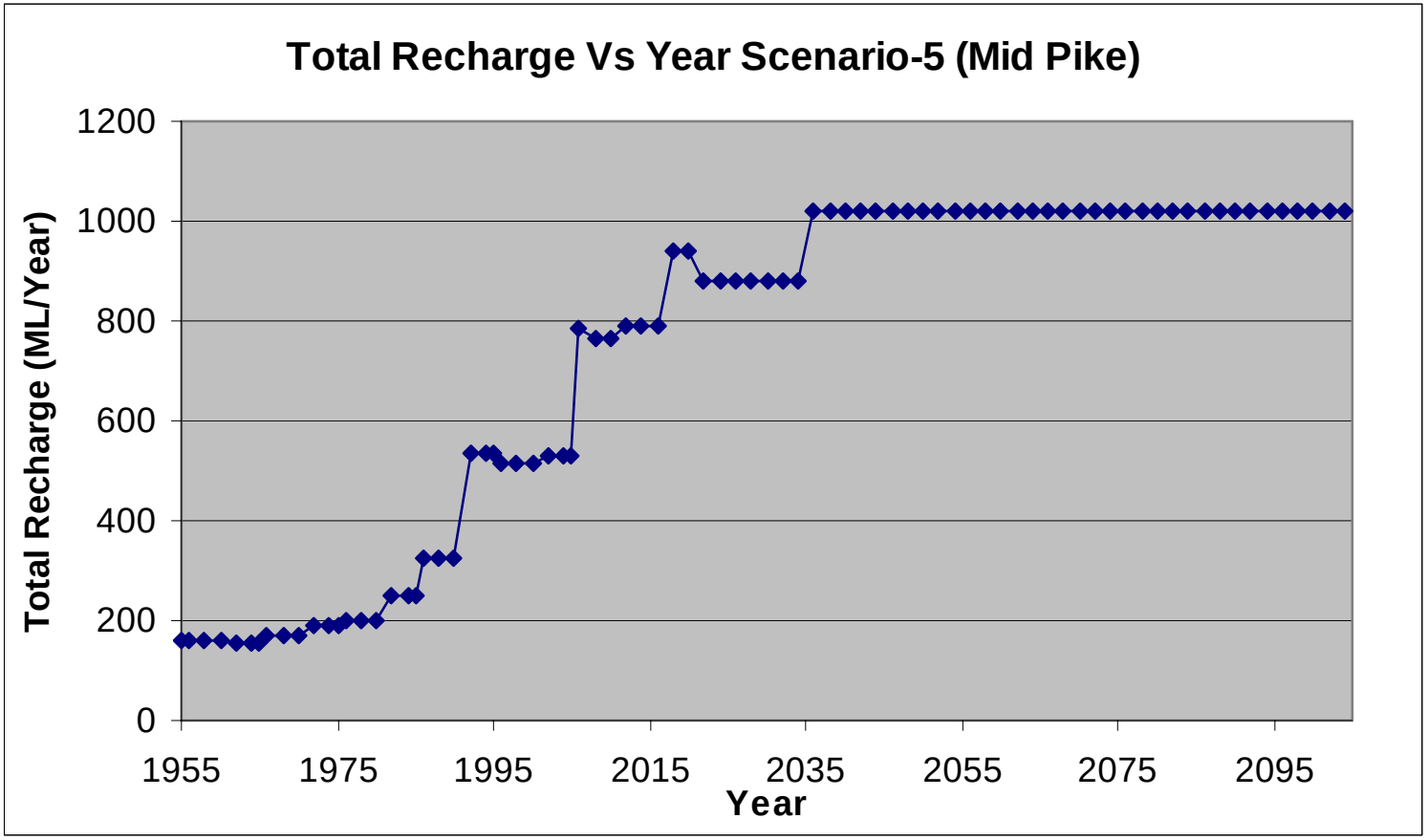
A-6 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000	2015
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25	20
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67	Zone 103
1955	**1960**	*0*	*1825*	240	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	200	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	200	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	200	165	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	200	165	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	180	150	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	180	150	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	180	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1995	**2000**	*14600*	*16425*	150	120	165	120	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2000	**2005**	*16425*	*18250*	120	120	160	120	0.1	60	0.1	0.1	0.1	0.1	0.1	0.1
2005	**2006**	*0*	*365*	120	120	160	120	120	60	120	120	0.1	0.1	0.1	0.1
2006	**2008**	*365*	*1095*	120	120	160	120	120	60	100	120	0.1	0.1	0.1	0.1
2008	**2010**	*1095*	*1825*	120	120	160	120	120	60	100	120	0.1	0.1	0.1	0.1
2010	**2012**	*1825*	*2555*	100	120	160	120	120	60	100	100	0.1	100	0.1	0.1
2012	**2014**	*2555*	*3285*	100	120	160	120	120	60	100	100	0.1	100	0.1	0.1
2014	**2016**	*3285*	*4015*	100	120	160	120	120	60	100	100	0.1	100	0.1	0.1
2016	**2018**	*4015*	*4745*	100	120	160	100	120	60	100	100	100	100	0.1	0.1
2018	**2020**	*4745*	*5475*	100	120	160	100	120	60	100	100	100	100	0.1	0.1
2020	**2022**	*5475*	*6205*	100	100	100	100	100	60	100	100	100	100	100	0.1
2022	**2024**	*6205*	*6935*	100	100	100	100	100	60	100	100	100	100	100	0.1
2024	**2026**	*6935*	*7665*	100	100	100	100	100	60	100	100	100	100	100	0.1
2026	**2028**	*7665*	*8395*	100	100	100	100	100	60	100	100	100	100	100	0.1
2028	**2030**	*8395*	*9125*	100	100	100	100	100	60	100	100	100	100	100	0.1
2030	**2032**	*9125*	*9855*	100	100	100	100	100	60	100	100	100	100	100	0.1
2032	**2034**	*9855*	*10585*	100	100	100	100	100	60	100	100	100	100	100	0.1
2034	**2036**	*10585*	*11315*	100	100	100	100	100	60	100	100	100	100	100	100
2036	**2038**	*11315*	*12045*	100	100	100	100	100	60	100	100	100	100	100	100
2038	**2040**	*12045*	*12775*	100	100	100	100	100	60	100	100	100	100	100	100
2040	**2042**	*12775*	*13505*	100	100	100	100	100	60	100	100	100	100	100	100
2042	**2044**	*13505*	*14235*	100	100	100	100	100	60	100	100	100	100	100	100

A-6 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Mid Pike Area)

Irrigation Start year				1940	1940	1950	1960-70	1960-70	1970	1980	1980	2000	2000	2000	2015
Lag time (yrs)				15	25	25	15-25	20-30	30	10	15	15	10	20-25	20
Start Year	Stop Year	Start Day	Stop Day	Zone 57	Zone 58	Zone 59	Zone 60	Zone 61	Zone 62	Zone 63	Zone 64	Zone 65	Zone 66	Zone 67	Zone 103
2044	**2046**	*14235*	*14965*	100	100	100	100	100	60	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	60	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	60	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	60	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	60	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	60	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	60	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	60	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	60	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	60	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	60	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	60	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	60	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	60	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	60	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	60	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	60	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	60	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	60	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	60	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	60	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	60	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	60	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	60	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	60	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	60	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	60	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	60	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	60	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	60	100	100	100	100	100	100

A-6 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Mid Pike Area)



A-6 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (Mid Pike Area)

A-7. MODEL INPUT – SIMARLOO AREA

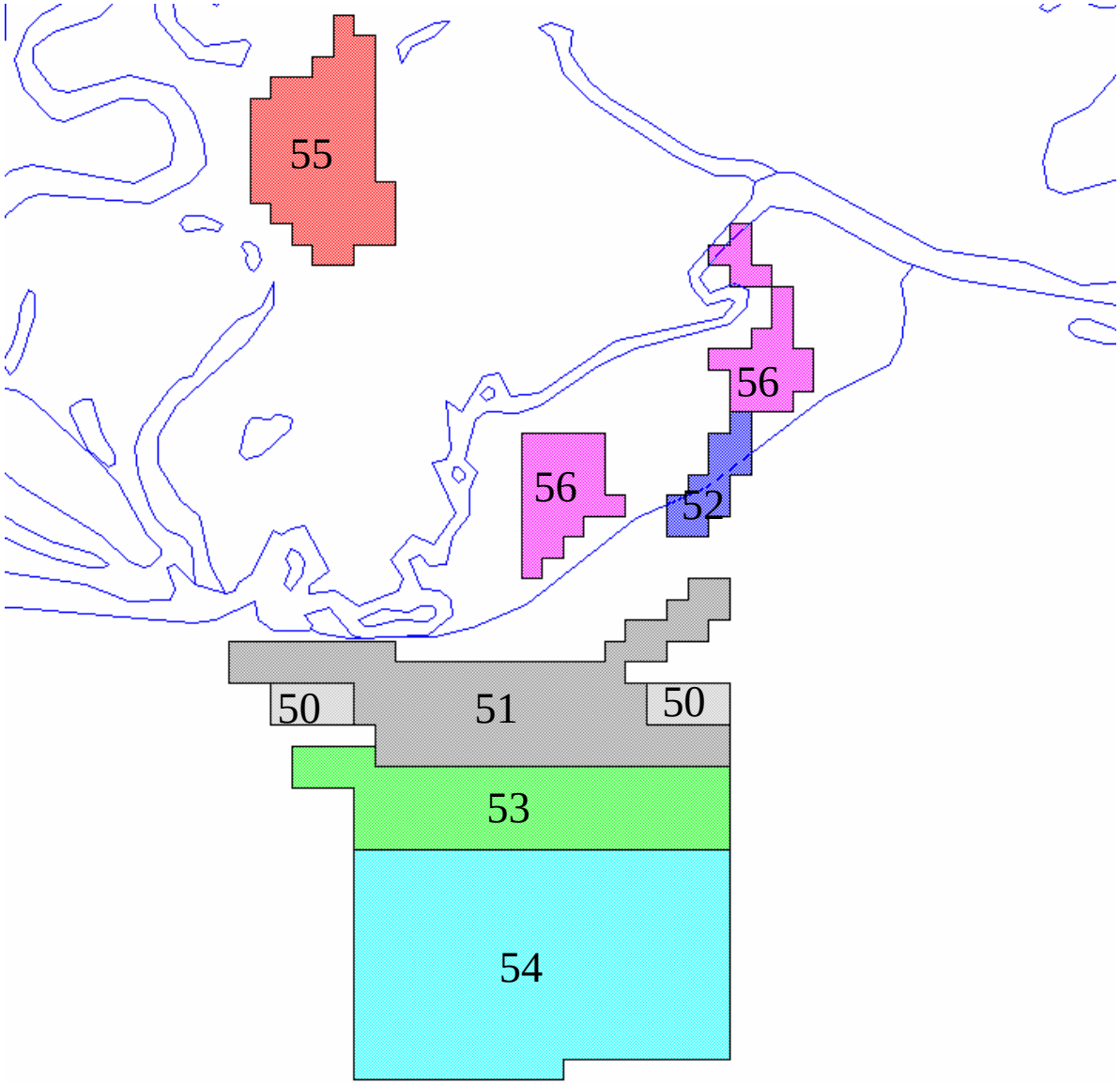
- Model recharge zones
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-7. Model Scenario conditions



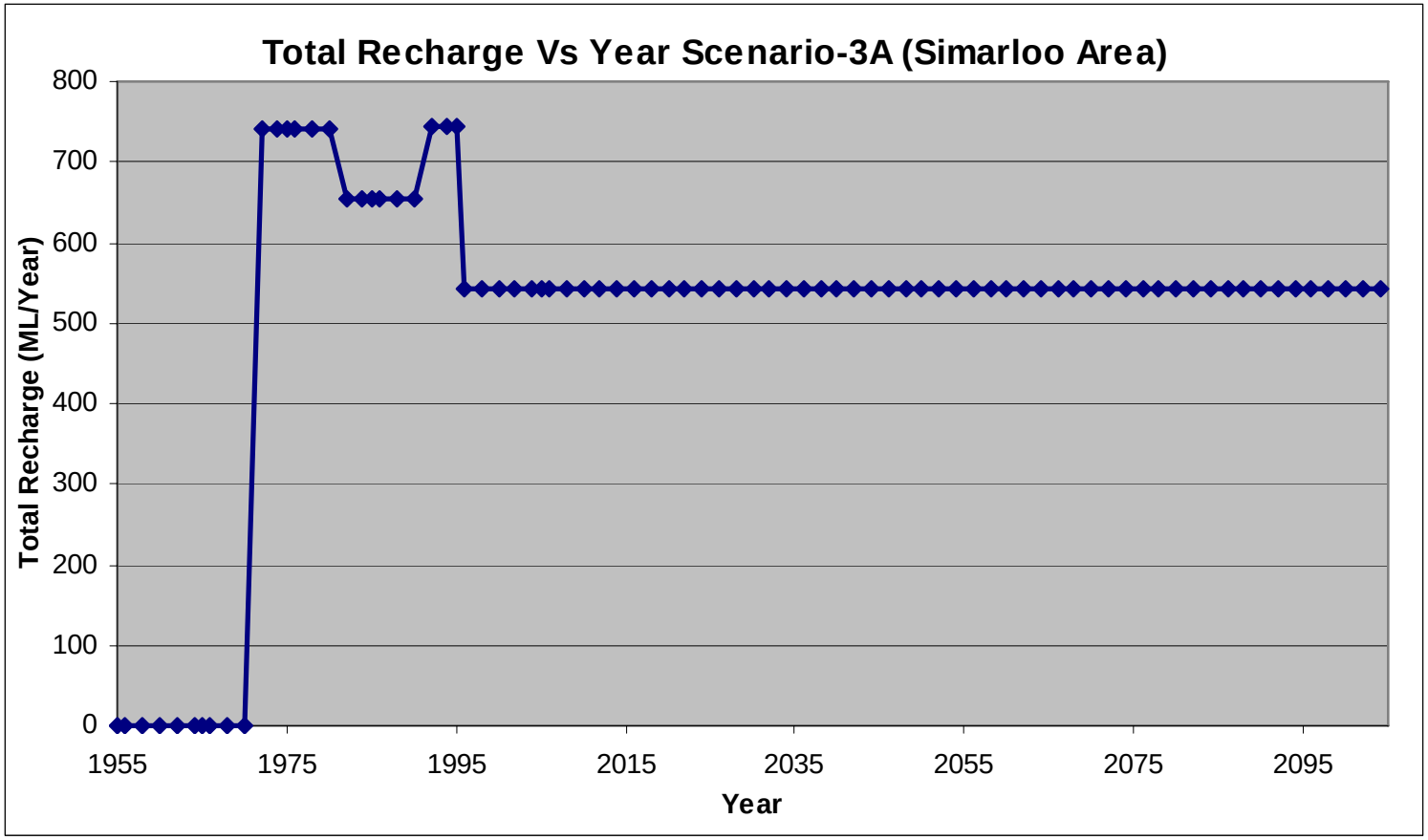
A-7. Model recharge zones in the Simarloo Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
1955	1960	0	1825	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	0.1	450	0.1	0.1	0.1	0.1
1965	1970	3650	5475	0.1	450	0.1	0.1	0.1	0.1
1970	1975	5475	7300	510	450	0.1	0.1	0.1	0.1
1975	1980	7300	9125	510	450	0.1	0.1	0.1	0.1
1980	1985	9125	10950	450	390	0.1	0.1	0.1	0.1
1985	1990	10950	12775	450	390	0.1	0.1	0.1	0.1
1990	1995	12775	14600	390	135	0.1	70	0.1	0.1
1995	2000	14600	16425	250	135	0.1	70	0.1	0.1
2000	2005	16425	18250	250	135	0.1	70	0.1	0.1
2005	2006	0	365	250	135	0.1	70	0.1	0.1
2006	2008	365	1095	250	135	0.1	70	0.1	0.1
2008	2010	1095	1825	250	135	0.1	70	0.1	0.1
2010	2012	1825	2555	250	135	0.1	70	0.1	0.1
2012	2014	2555	3285	250	135	0.1	70	0.1	0.1
2014	2016	3285	4015	250	135	0.1	70	0.1	0.1
2016	2018	4015	4745	250	135	0.1	70	0.1	0.1
2018	2020	4745	5475	250	135	0.1	70	0.1	0.1
2020	2022	5475	6205	250	135	0.1	70	0.1	0.1
2022	2024	6205	6935	250	135	0.1	70	0.1	0.1
2024	2026	6935	7665	250	135	0.1	70	0.1	0.1
2026	2028	7665	8395	250	135	0.1	70	0.1	0.1
2028	2030	8395	9125	250	135	0.1	70	0.1	0.1
2030	2032	9125	9855	250	135	0.1	70	0.1	0.1
2032	2034	9855	10585	250	135	0.1	70	0.1	0.1
2034	2036	10585	11315	250	135	0.1	70	0.1	0.1
2036	2038	11315	12045	250	135	0.1	70	0.1	0.1
2038	2040	12045	12775	250	135	0.1	70	0.1	0.1
2040	2042	12775	13505	250	135	0.1	70	0.1	0.1
2042	2044	13505	14235	250	135	0.1	70	0.1	0.1

A-7 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
2044	**2046**	*14235*	*14965*	250	135	0.1	70	0.1	0.1
2046	**2048**	*14965*	*15695*	250	135	0.1	70	0.1	0.1
2048	**2050**	*15695*	*16425*	250	135	0.1	70	0.1	0.1
2050	**2052**	*16425*	*17155*	250	135	0.1	70	0.1	0.1
2052	**2054**	*17155*	*17885*	250	135	0.1	70	0.1	0.1
2054	**2056**	*17885*	*18615*	250	135	0.1	70	0.1	0.1
2056	**2058**	*18615*	*19345*	250	135	0.1	70	0.1	0.1
2058	**2060**	*19345*	*20075*	250	135	0.1	70	0.1	0.1
2060	**2062**	*20075*	*20805*	250	135	0.1	70	0.1	0.1
2062	**2064**	*20805*	*21535*	250	135	0.1	70	0.1	0.1
2064	**2066**	*21535*	*22265*	250	135	0.1	70	0.1	0.1
2066	**2068**	*22265*	*22995*	250	135	0.1	70	0.1	0.1
2068	**2070**	*22995*	*23725*	250	135	0.1	70	0.1	0.1
2070	**2072**	*23725*	*24455*	250	135	0.1	70	0.1	0.1
2072	**2074**	*24455*	*25185*	250	135	0.1	70	0.1	0.1
2074	**2076**	*25185*	*25915*	250	135	0.1	70	0.1	0.1
2076	**2078**	*25915*	*26645*	250	135	0.1	70	0.1	0.1
2078	**2080**	*26645*	*27375*	250	135	0.1	70	0.1	0.1
2080	**2082**	*27375*	*28105*	250	135	0.1	70	0.1	0.1
2082	**2084**	*28105*	*28835*	250	135	0.1	70	0.1	0.1
2084	**2086**	*28835*	*29565*	250	135	0.1	70	0.1	0.1
2086	**2088**	*29565*	*30295*	250	135	0.1	70	0.1	0.1
2088	**2090**	*30295*	*31025*	250	135	0.1	70	0.1	0.1
2090	**2092**	*31025*	*31755*	250	135	0.1	70	0.1	0.1
2092	**2094**	*31755*	*32485*	250	135	0.1	70	0.1	0.1
2094	**2096**	*32485*	*33215*	250	135	0.1	70	0.1	0.1
2096	**2098**	*33215*	*33945*	250	135	0.1	70	0.1	0.1
2098	**2100**	*33945*	*34675*	250	135	0.1	70	0.1	0.1
2100	**2102**	*34675*	*35405*	250	135	0.1	70	0.1	0.1
2102	**2104**	*35405*	*36135*	250	135	0.1	70	0.1	0.1

A-7 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Simarloo Area)



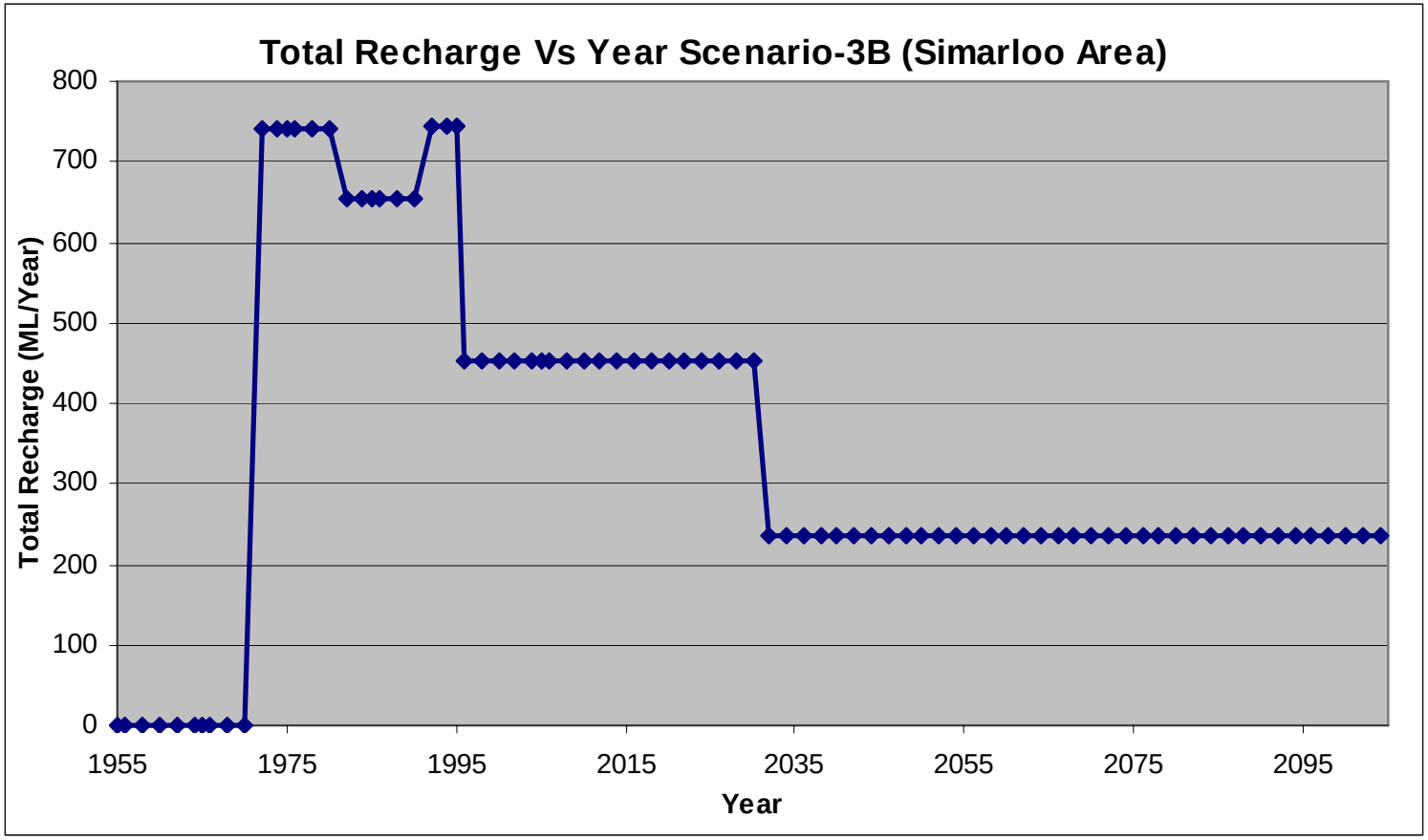
A-7 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	450	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	450	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	510	450	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	510	450	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	450	390	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	450	390	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	390	135	0.1	70	0.1	0.1
1995	**2000**	*14600*	*16425*	250	135	0.1	35	0.1	0.1
2000	**2005**	*16425*	*18250*	250	115	0.1	35	0.1	0.1
2005	**2006**	*0*	*365*	250	115	0.1	35	0.1	0.1
2006	**2008**	*365*	*1095*	250	100	0.1	35	0.1	0.1
2008	**2010**	*1095*	*1825*	250	100	0.1	35	0.1	0.1
2010	**2012**	*1825*	*2555*	250	100	0.1	35	0.1	0.1
2012	**2014**	*2555*	*3285*	250	100	0.1	35	0.1	0.1
2014	**2016**	*3285*	*4015*	250	100	0.1	35	0.1	0.1
2016	**2018**	*4015*	*4745*	250	100	0.1	35	0.1	0.1
2018	**2020**	*4745*	*5475*	250	100	0.1	35	0.1	0.1
2020	**2022**	*5475*	*6205*	250	100	0.1	35	0.1	0.1
2022	**2024**	*6205*	*6935*	250	100	0.1	35	0.1	0.1
2024	**2026**	*6935*	*7665*	250	100	0.1	35	0.1	0.1
2026	**2028**	*7665*	*8395*	250	100	0.1	35	0.1	0.1
2028	**2030**	*8395*	*9125*	250	100	0.1	35	0.1	0.1
2030	**2032**	*9125*	*9855*	100	100	0.1	35	0.1	0.1
2032	**2034**	*9855*	*10585*	100	100	0.1	35	0.1	0.1
2034	**2036**	*10585*	*11315*	100	100	0.1	35	0.1	0.1
2036	**2038**	*11315*	*12045*	100	100	0.1	35	0.1	0.1
2038	**2040**	*12045*	*12775*	100	100	0.1	35	0.1	0.1
2040	**2042**	*12775*	*13505*	100	100	0.1	35	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	0.1	35	0.1	0.1

A-7 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
2044	**2046**	*14235*	*14965*	100	100	0.1	35	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	0.1	35	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	0.1	35	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	0.1	35	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	0.1	35	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	0.1	35	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	0.1	35	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	0.1	35	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	0.1	35	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	0.1	35	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	0.1	35	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	0.1	35	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	0.1	35	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	0.1	35	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	0.1	35	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	0.1	35	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	0.1	35	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	0.1	35	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	0.1	35	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	0.1	35	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	0.1	35	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	0.1	35	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	0.1	35	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	0.1	35	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	0.1	35	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	0.1	35	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	0.1	35	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	0.1	35	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	0.1	35	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	0.1	35	0.1	0.1

A-7 (S3B-2) . Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Simarloo Area)



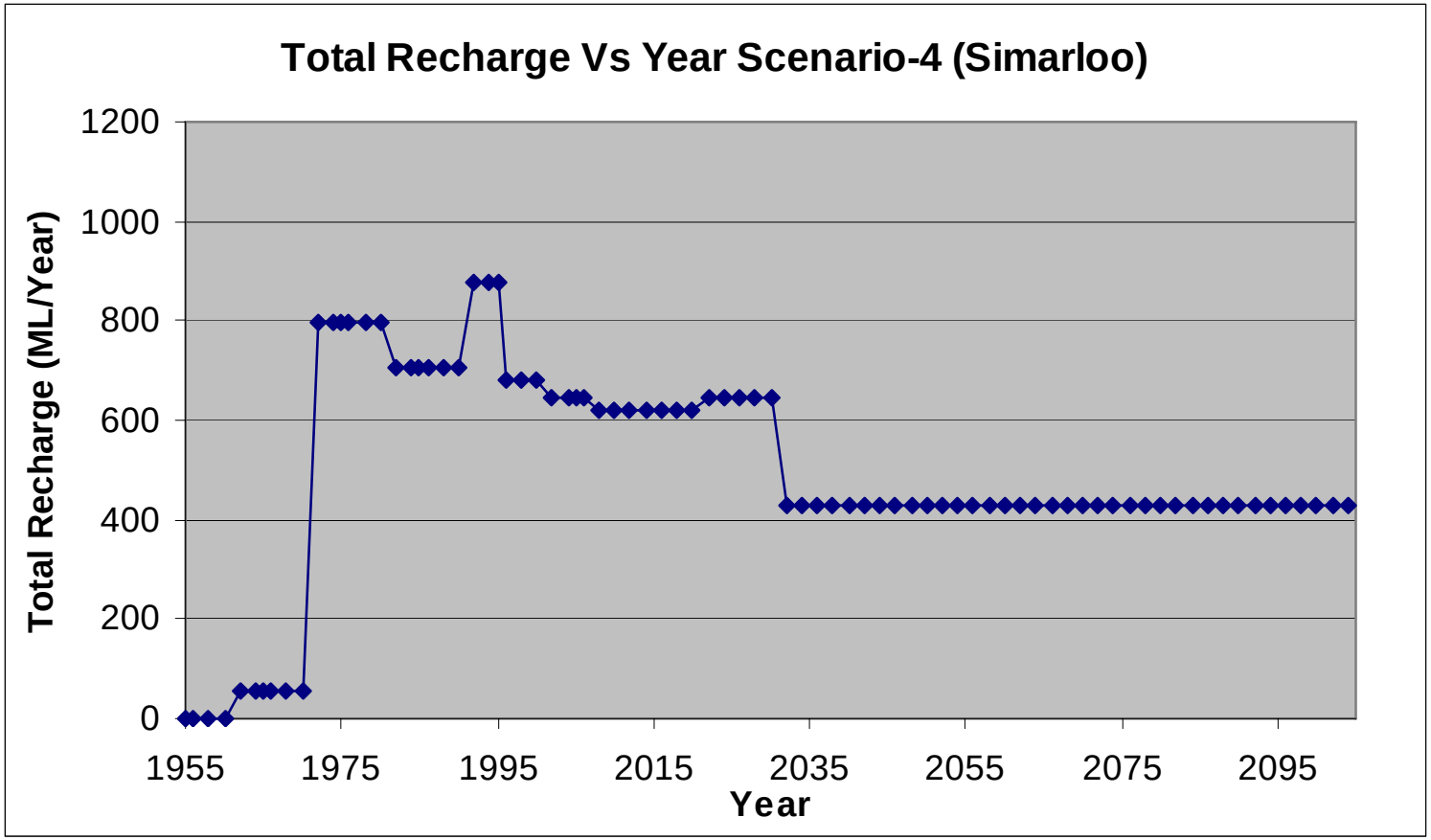
A-7 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
1955	**1960**	*0*	*1825*	0.1	0.1	0.1	0.1	0.1	0.1
1960	**1965**	*1825*	*3650*	0.1	450	0.1	0.1	0.1	0.1
1965	**1970**	*3650*	*5475*	0.1	450	0.1	0.1	0.1	0.1
1970	**1975**	*5475*	*7300*	510	450	0.1	0.1	0.1	0.1
1975	**1980**	*7300*	*9125*	510	450	0.1	0.1	0.1	0.1
1980	**1985**	*9125*	*10950*	450	390	0.1	0.1	0.1	0.1
1985	**1990**	*10950*	*12775*	450	390	0.1	0.1	0.1	0.1
1990	**1995**	*12775*	*14600*	390	135	0.1	70	135	0.1
1995	**2000**	*14600*	*16425*	250	135	0.1	35	135	135
2000	**2005**	*16425*	*18250*	250	115	0.1	35	115	115
2005	**2006**	*0*	*365*	250	115	0.1	35	115	115
2006	**2008**	*365*	*1095*	250	100	0.1	35	100	100
2008	**2010**	*1095*	*1825*	250	100	0.1	35	100	100
2010	**2012**	*1825*	*2555*	250	100	0.1	35	100	100
2012	**2014**	*2555*	*3285*	250	100	0.1	35	100	100
2014	**2016**	*3285*	*4015*	250	100	0.1	35	100	100
2016	**2018**	*4015*	*4745*	250	100	0.1	35	100	100
2018	**2020**	*4745*	*5475*	250	100	0.1	35	100	100
2020	**2022**	*5475*	*6205*	250	100	0.1	35	100	100
2022	**2024**	*6205*	*6935*	250	100	0.1	35	100	100
2024	**2026**	*6935*	*7665*	250	100	0.1	35	100	100
2026	**2028**	*7665*	*8395*	250	100	0.1	35	100	100
2028	**2030**	*8395*	*9125*	250	100	0.1	35	100	100
2030	**2032**	*9125*	*9855*	100	100	0.1	35	100	100
2032	**2034**	*9855*	*10585*	100	100	0.1	35	100	100
2034	**2036**	*10585*	*11315*	100	100	0.1	35	100	100
2036	**2038**	*11315*	*12045*	100	100	0.1	35	100	100
2038	**2040**	*12045*	*12775*	100	100	0.1	35	100	100
2040	**2042**	*12775*	*13505*	100	100	0.1	35	100	100
2042	**2044**	*13505*	*14235*	100	100	0.1	35	100	100

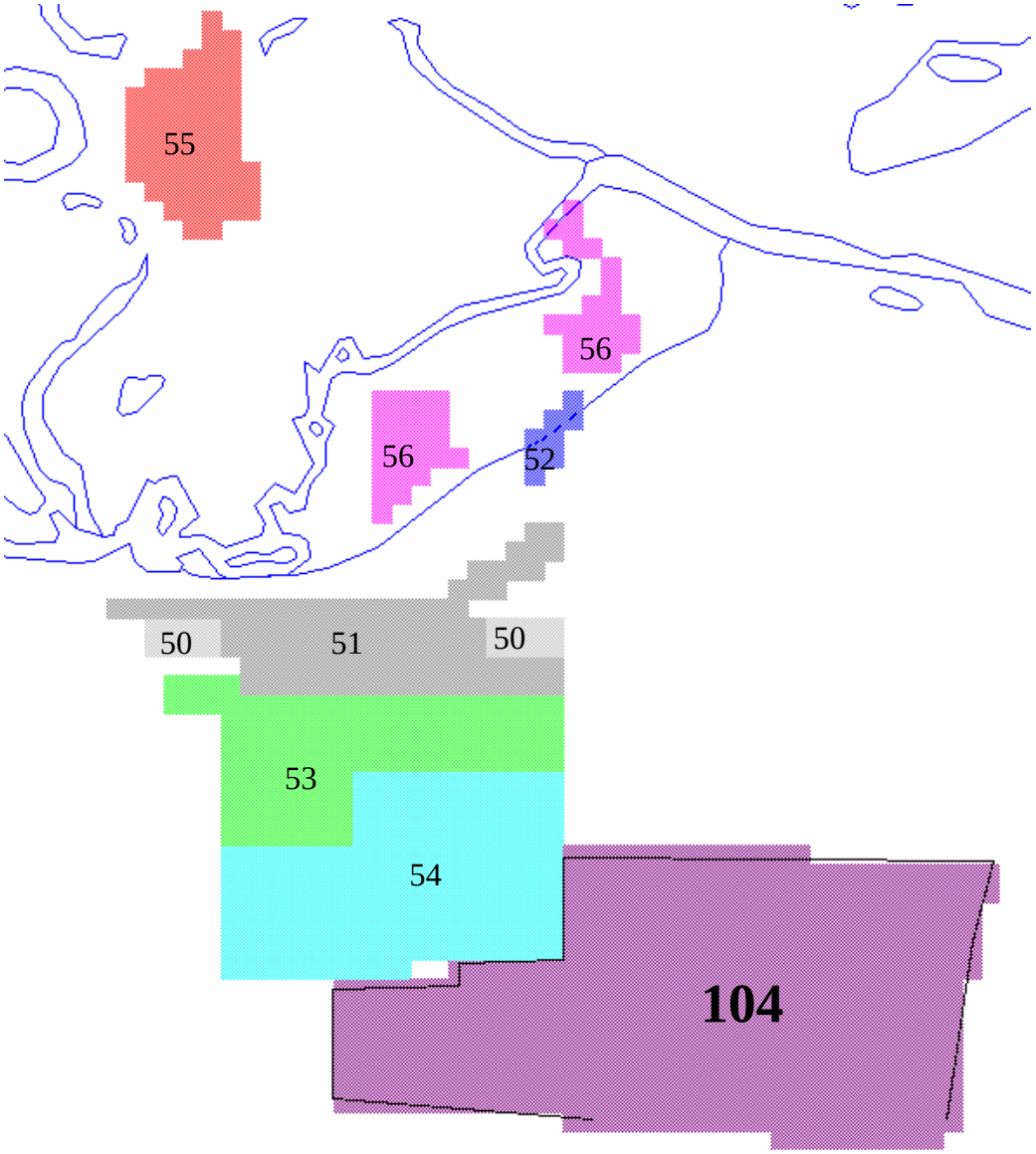
A-7 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995
Lag time (yrs)				30-35	10	25-30	15-20	0	0
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56
2044	**2046**	*14235*	*14965*	100	100	0.1	35	100	100
2046	**2048**	*14965*	*15695*	100	100	0.1	35	100	100
2048	**2050**	*15695*	*16425*	100	100	0.1	35	100	100
2050	**2052**	*16425*	*17155*	100	100	0.1	35	100	100
2052	**2054**	*17155*	*17885*	100	100	0.1	35	100	100
2054	**2056**	*17885*	*18615*	100	100	0.1	35	100	100
2056	**2058**	*18615*	*19345*	100	100	0.1	35	100	100
2058	**2060**	*19345*	*20075*	100	100	0.1	35	100	100
2060	**2062**	*20075*	*20805*	100	100	0.1	35	100	100
2062	**2064**	*20805*	*21535*	100	100	0.1	35	100	100
2064	**2066**	*21535*	*22265*	100	100	0.1	35	100	100
2066	**2068**	*22265*	*22995*	100	100	0.1	35	100	100
2068	**2070**	*22995*	*23725*	100	100	0.1	35	100	100
2070	**2072**	*23725*	*24455*	100	100	0.1	35	100	100
2072	**2074**	*24455*	*25185*	100	100	0.1	35	100	100
2074	**2076**	*25185*	*25915*	100	100	0.1	35	100	100
2076	**2078**	*25915*	*26645*	100	100	0.1	35	100	100
2078	**2080**	*26645*	*27375*	100	100	0.1	35	100	100
2080	**2082**	*27375*	*28105*	100	100	0.1	35	100	100
2082	**2084**	*28105*	*28835*	100	100	0.1	35	100	100
2084	**2086**	*28835*	*29565*	100	100	0.1	35	100	100
2086	**2088**	*29565*	*30295*	100	100	0.1	35	100	100
2088	**2090**	*30295*	*31025*	100	100	0.1	35	100	100
2090	**2092**	*31025*	*31755*	100	100	0.1	35	100	100
2092	**2094**	*31755*	*32485*	100	100	0.1	35	100	100
2094	**2096**	*32485*	*33215*	100	100	0.1	35	100	100
2096	**2098**	*33215*	*33945*	100	100	0.1	35	100	100
2098	**2100**	*33945*	*34675*	100	100	0.1	35	100	100
2100	**2102**	*34675*	*35405*	100	100	0.1	35	100	100
2102	**2104**	*35405*	*36135*	100	100	0.1	35	100	100

A-7 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Simarloo Area)



A-7 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (Simarloo Area)



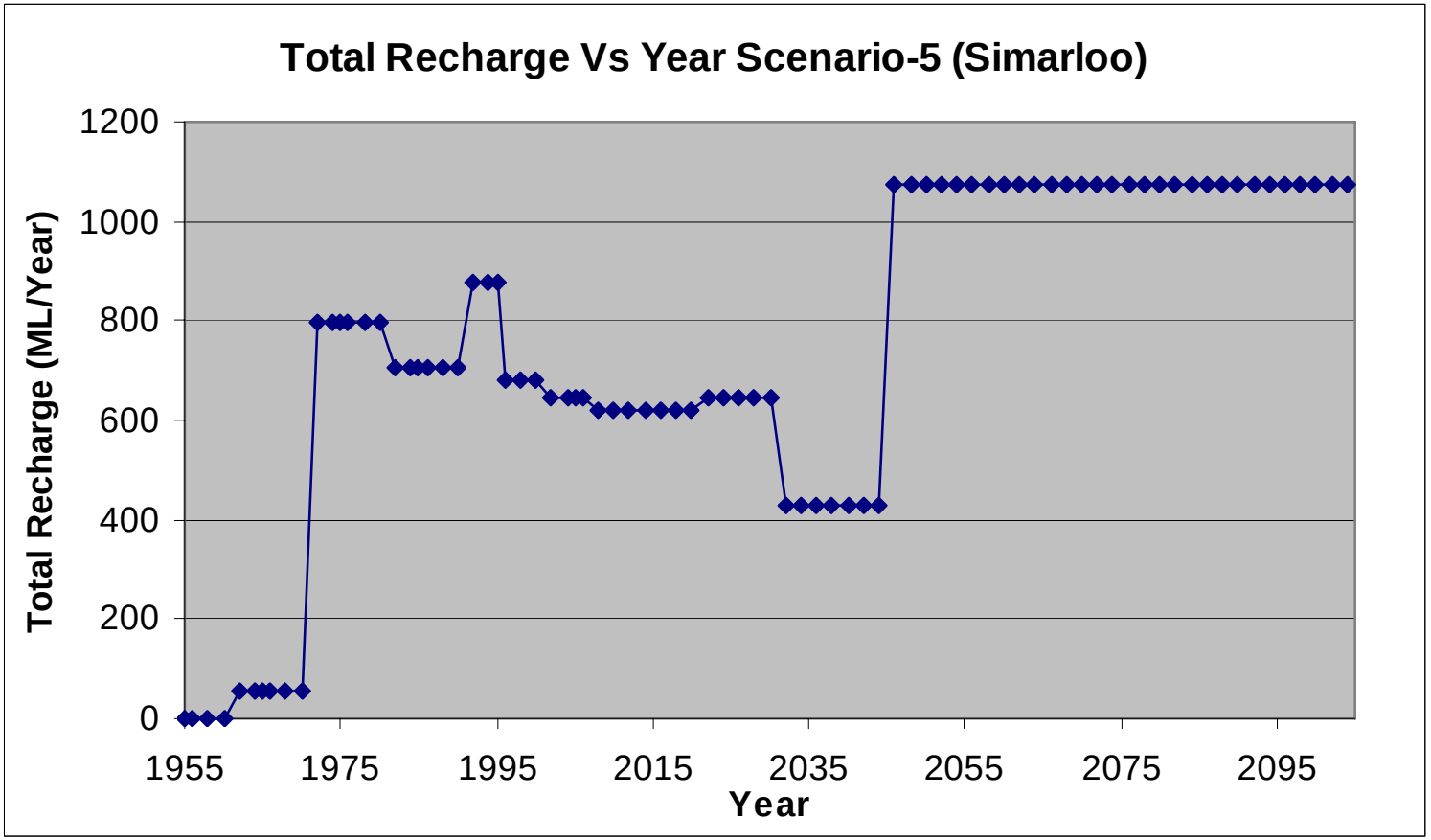
A-7 (S5-1). Model recharge zones for current plus future development irrigation scenario, Scenario-5 (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995	2015
Lag time (yrs)				30-35	10	25-30	15-20	0	0	30
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56	Zone 104
1955	1960	0	1825	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	0.1	450	0.1	0.1	0.1	0.1	0.1
1965	1970	3650	5475	0.1	450	0.1	0.1	0.1	0.1	0.1
1970	1975	5475	7300	510	450	0.1	0.1	0.1	0.1	0.1
1975	1980	7300	9125	510	450	0.1	0.1	0.1	0.1	0.1
1980	1985	9125	10950	450	390	0.1	0.1	0.1	0.1	0.1
1985	1990	10950	12775	450	390	0.1	0.1	0.1	0.1	0.1
1990	1995	12775	14600	390	135	0.1	70	135	0.1	0.1
1995	2000	14600	16425	250	135	0.1	35	135	135	0.1
2000	2005	16425	18250	250	115	0.1	35	115	115	0.1
2005	2006	0	365	250	115	0.1	35	115	115	0.1
2006	2008	365	1095	250	100	0.1	35	100	100	0.1
2008	2010	1095	1825	250	100	0.1	35	100	100	0.1
2010	2012	1825	2555	250	100	0.1	35	100	100	0.1
2012	2014	2555	3285	250	100	0.1	35	100	100	0.1
2014	2016	3285	4015	250	100	0.1	35	100	100	0.1
2016	2018	4015	4745	250	100	0.1	35	100	100	0.1
2018	2020	4745	5475	250	100	0.1	35	100	100	0.1
2020	2022	5475	6205	250	100	0.1	35	100	100	0.1
2022	2024	6205	6935	250	100	0.1	35	100	100	0.1
2024	2026	6935	7665	250	100	0.1	35	100	100	0.1
2026	2028	7665	8395	250	100	0.1	35	100	100	0.1
2028	2030	8395	9125	250	100	0.1	35	100	100	0.1
2030	2032	9125	9855	100	100	0.1	35	100	100	0.1
2032	2034	9855	10585	100	100	0.1	35	100	100	0.1
2034	2036	10585	11315	100	100	0.1	35	100	100	0.1
2036	2038	11315	12045	100	100	0.1	35	100	100	0.1
2038	2040	12045	12775	100	100	0.1	35	100	100	0.1
2040	2042	12775	13505	100	100	0.1	35	100	100	0.1
2042	2044	13505	14235	100	100	0.1	35	100	100	0.1

A-7 (S5-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Simarloo Area)

Irrigation Start year				1940	1950	1950-65	1970-1980	1988	1995	2015
Lag time (yrs)				30-35	10	25-30	15-20	0	0	30
Start Year	Stop Year	Start Day	Stop Day	Zone 51	Zone 52	Zone 53	Zone 54	Zone 55	Zone 56	Zone 104
2044	**2046**	*14235*	*14965*	100	100	0.1	35	100	100	100
2046	**2048**	*14965*	*15695*	100	100	0.1	35	100	100	100
2048	**2050**	*15695*	*16425*	100	100	0.1	35	100	100	100
2050	**2052**	*16425*	*17155*	100	100	0.1	35	100	100	100
2052	**2054**	*17155*	*17885*	100	100	0.1	35	100	100	100
2054	**2056**	*17885*	*18615*	100	100	0.1	35	100	100	100
2056	**2058**	*18615*	*19345*	100	100	0.1	35	100	100	100
2058	**2060**	*19345*	*20075*	100	100	0.1	35	100	100	100
2060	**2062**	*20075*	*20805*	100	100	0.1	35	100	100	100
2062	**2064**	*20805*	*21535*	100	100	0.1	35	100	100	100
2064	**2066**	*21535*	*22265*	100	100	0.1	35	100	100	100
2066	**2068**	*22265*	*22995*	100	100	0.1	35	100	100	100
2068	**2070**	*22995*	*23725*	100	100	0.1	35	100	100	100
2070	**2072**	*23725*	*24455*	100	100	0.1	35	100	100	100
2072	**2074**	*24455*	*25185*	100	100	0.1	35	100	100	100
2074	**2076**	*25185*	*25915*	100	100	0.1	35	100	100	100
2076	**2078**	*25915*	*26645*	100	100	0.1	35	100	100	100
2078	**2080**	*26645*	*27375*	100	100	0.1	35	100	100	100
2080	**2082**	*27375*	*28105*	100	100	0.1	35	100	100	100
2082	**2084**	*28105*	*28835*	100	100	0.1	35	100	100	100
2084	**2086**	*28835*	*29565*	100	100	0.1	35	100	100	100
2086	**2088**	*29565*	*30295*	100	100	0.1	35	100	100	100
2088	**2090**	*30295*	*31025*	100	100	0.1	35	100	100	100
2090	**2092**	*31025*	*31755*	100	100	0.1	35	100	100	100
2092	**2094**	*31755*	*32485*	100	100	0.1	35	100	100	100
2094	**2096**	*32485*	*33215*	100	100	0.1	35	100	100	100
2096	**2098**	*33215*	*33945*	100	100	0.1	35	100	100	100
2098	**2100**	*33945*	*34675*	100	100	0.1	35	100	100	100
2100	**2102**	*34675*	*35405*	100	100	0.1	35	100	100	100
2102	**2104**	*35405*	*36135*	100	100	0.1	35	100	100	100

A-7 (S5-3). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-5 (Simarloo Area)



A-7 (S5-4). Total recharge volume to the Loxton Sands in Scenario-5 (Simarloo Area)

A–8. MODEL INPUT – LYRUP AREA

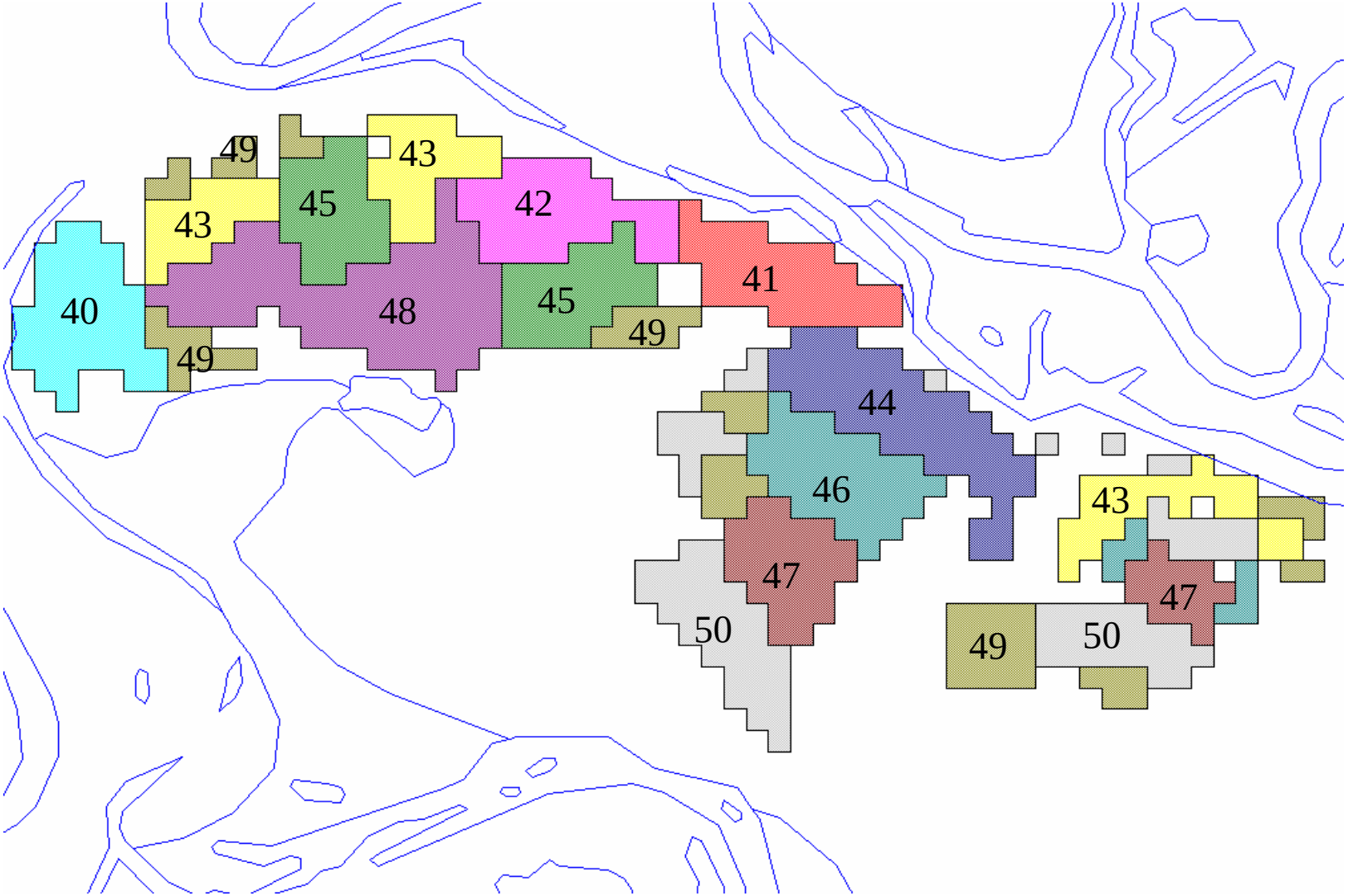
- Model recharge zones
- Model recharge rates (mm/yr)
- Irrigation start year and lag time
- Total model recharge volume

(Scenario-3A, Scenario-3B, Scenario-4 and Scenario-5)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

A-8. Model Scenario conditions



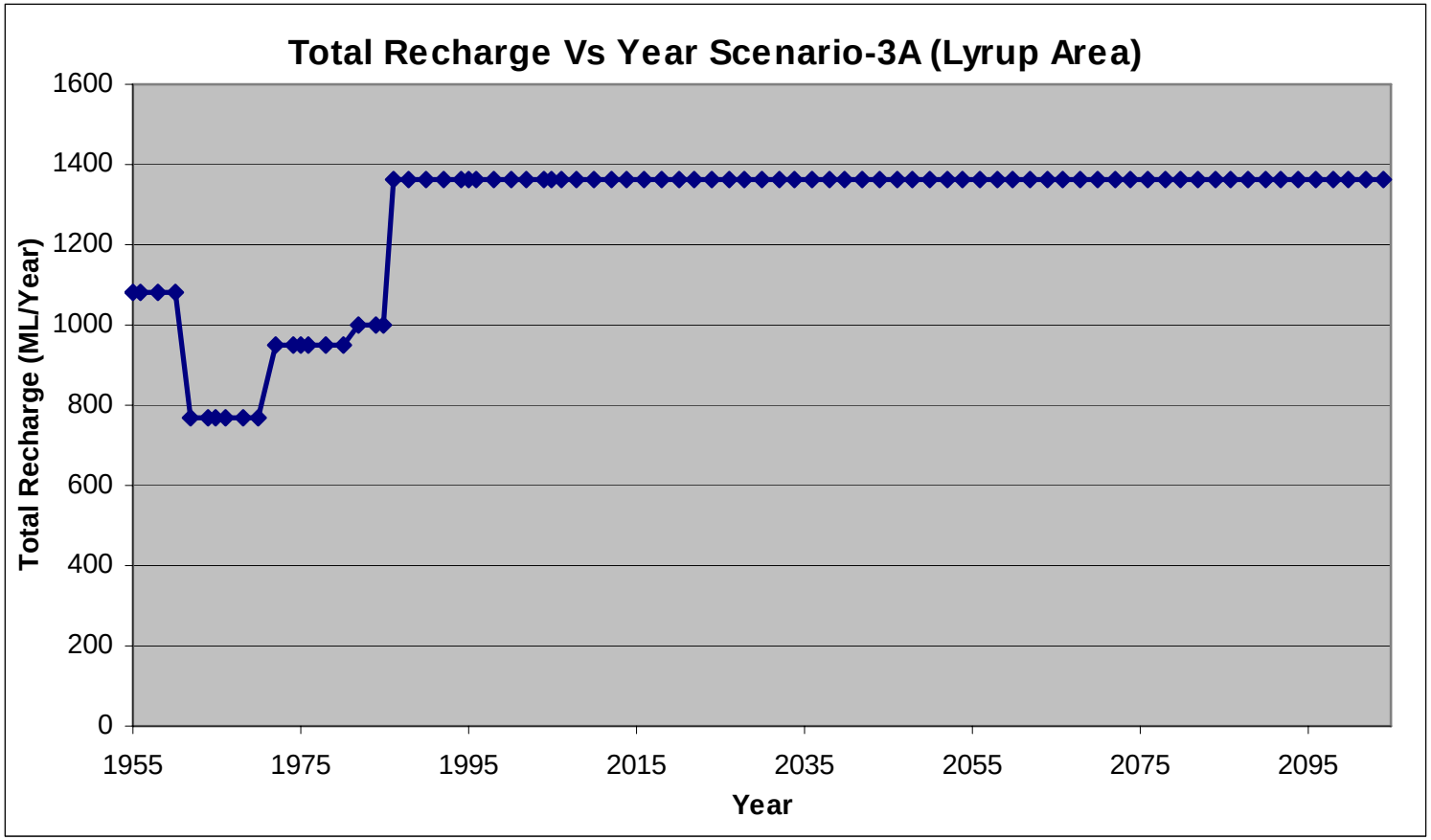
A-8. Model recharge zones in the Lyrup Area (Scenario-3A, Scenario-3B, Scenario-4)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
1885	1935	0	18250	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1935	1945	18250	21900	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1945	1950	21900	23725	500	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1950	1955	23725	25550	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1955	1960	0	1825	400	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1965	1970	3650	5475	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1970	1975	5475	7300	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1975	1980	7300	9125	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1980	1985	9125	10950	200	200	200	200	200	200	200	0.1	0.1	0.1	0.1
1985	1990	10950	12775	200	200	200	200	200	200	200	200	200	0.1	0.1
1990	1995	12775	14600	200	200	200	200	200	200	200	200	200	0.1	0.1
1995	2000	14600	16425	200	200	200	200	200	200	200	200	200	0.1	0.1
2000	2005	16425	18250	200	200	200	200	200	200	200	200	200	0.1	0.1
2005	2006	0	365	200	200	200	200	200	200	200	200	200	0.1	0.1
2006	2008	365	1095	200	200	200	200	200	200	200	200	200	0.1	0.1
2008	2010	1095	1825	200	200	200	200	200	200	200	200	200	0.1	0.1
2010	2012	1825	2555	200	200	200	200	200	200	200	200	200	0.1	0.1
2012	2014	2555	3285	200	200	200	200	200	200	200	200	200	0.1	0.1
2014	2016	3285	4015	200	200	200	200	200	200	200	200	200	0.1	0.1
2016	2018	4015	4745	200	200	200	200	200	200	200	200	200	0.1	0.1
2018	2020	4745	5475	200	200	200	200	200	200	200	200	200	0.1	0.1
2020	2022	5475	6205	200	200	200	200	200	200	200	200	200	0.1	0.1
2022	2024	6205	6935	200	200	200	200	200	200	200	200	200	0.1	0.1
2024	2026	6935	7665	200	200	200	200	200	200	200	200	200	0.1	0.1
2026	2028	7665	8395	200	200	200	200	200	200	200	200	200	0.1	0.1
2028	2030	8395	9125	200	200	200	200	200	200	200	200	200	0.1	0.1
2030	2032	9125	9855	200	200	200	200	200	200	200	200	200	0.1	0.1
2032	2034	9855	10585	200	200	200	200	200	200	200	200	200	0.1	0.1
2034	2036	10585	11315	200	200	200	200	200	200	200	200	200	0.1	0.1
2036	2038	11315	12045	200	200	200	200	200	200	200	200	200	0.1	0.1
2038	2040	12045	12775	200	200	200	200	200	200	200	200	200	0.1	0.1

A-8 (S3A-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Lyrup Area)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
2040	**2042**	*12775*	*13505*	200	200	200	200	200	200	200	200	200	0.1	0.1
2042	**2044**	*13505*	*14235*	200	200	200	200	200	200	200	200	200	0.1	0.1
2044	**2046**	*14235*	*14965*	200	200	200	200	200	200	200	200	200	0.1	0.1
2046	**2048**	*14965*	*15695*	200	200	200	200	200	200	200	200	200	0.1	0.1
2048	**2050**	*15695*	*16425*	200	200	200	200	200	200	200	200	200	0.1	0.1
2050	**2052**	*16425*	*17155*	200	200	200	200	200	200	200	200	200	0.1	0.1
2052	**2054**	*17155*	*17885*	200	200	200	200	200	200	200	200	200	0.1	0.1
2054	**2056**	*17885*	*18615*	200	200	200	200	200	200	200	200	200	0.1	0.1
2056	**2058**	*18615*	*19345*	200	200	200	200	200	200	200	200	200	0.1	0.1
2058	**2060**	*19345*	*20075*	200	200	200	200	200	200	200	200	200	0.1	0.1
2060	**2062**	*20075*	*20805*	200	200	200	200	200	200	200	200	200	0.1	0.1
2062	**2064**	*20805*	*21535*	200	200	200	200	200	200	200	200	200	0.1	0.1
2064	**2066**	*21535*	*22265*	200	200	200	200	200	200	200	200	200	0.1	0.1
2066	**2068**	*22265*	*22995*	200	200	200	200	200	200	200	200	200	0.1	0.1
2068	**2070**	*22995*	*23725*	200	200	200	200	200	200	200	200	200	0.1	0.1
2070	**2072**	*23725*	*24455*	200	200	200	200	200	200	200	200	200	0.1	0.1
2072	**2074**	*24455*	*25185*	200	200	200	200	200	200	200	200	200	0.1	0.1
2074	**2076**	*25185*	*25915*	200	200	200	200	200	200	200	200	200	0.1	0.1
2076	**2078**	*25915*	*26645*	200	200	200	200	200	200	200	200	200	0.1	0.1
2078	**2080**	*26645*	*27375*	200	200	200	200	200	200	200	200	200	0.1	0.1
2080	**2082**	*27375*	*28105*	200	200	200	200	200	200	200	200	200	0.1	0.1
2082	**2084**	*28105*	*28835*	200	200	200	200	200	200	200	200	200	0.1	0.1
2084	**2086**	*28835*	*29565*	200	200	200	200	200	200	200	200	200	0.1	0.1
2086	**2088**	*29565*	*30295*	200	200	200	200	200	200	200	200	200	0.1	0.1
2088	**2090**	*30295*	*31025*	200	200	200	200	200	200	200	200	200	0.1	0.1
2090	**2092**	*31025*	*31755*	200	200	200	200	200	200	200	200	200	0.1	0.1
2092	**2094**	*31755*	*32485*	200	200	200	200	200	200	200	200	200	0.1	0.1
2094	**2096**	*32485*	*33215*	200	200	200	200	200	200	200	200	200	0.1	0.1
2096	**2098**	*33215*	*33945*	200	200	200	200	200	200	200	200	200	0.1	0.1
2098	**2100**	*33945*	*34675*	200	200	200	200	200	200	200	200	200	0.1	0.1
2100	**2102**	*34675*	*35405*	200	200	200	200	200	200	200	200	200	0.1	0.1
2102	**2104**	*35405*	*36135*	200	200	200	200	200	200	200	200	200	0.1	0.1

A-8 (S3A-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3A (Lyrup Area)



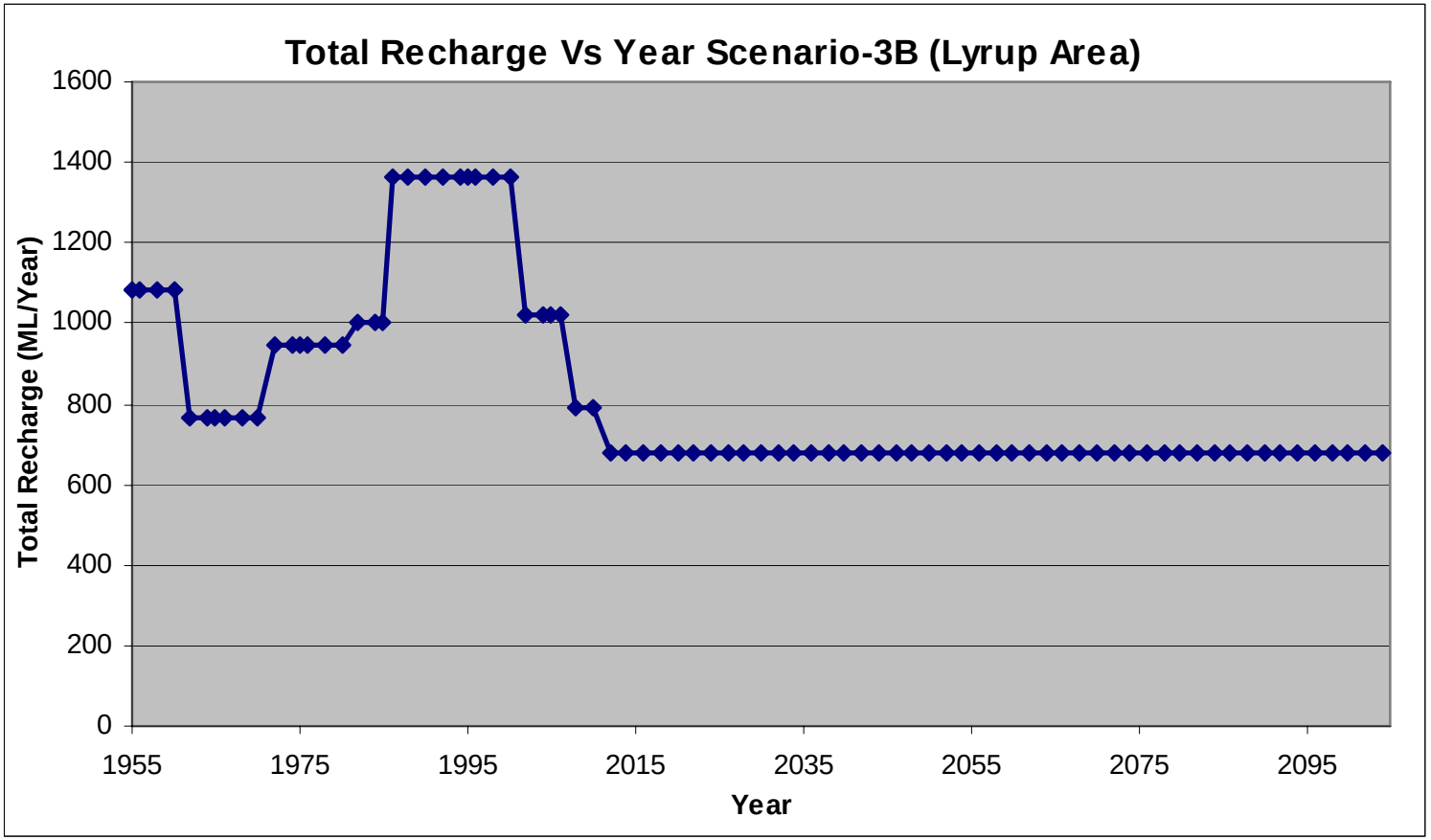
A-8 (S3A-3). Total recharge volume to the Loxton Sands in Scenario-3A (Lyrup Area)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
1885	1935	0	18250	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1935	1945	18250	21900	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1945	1950	21900	23725	500	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1950	1955	23725	25550	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1955	1960	0	1825	400	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1965	1970	3650	5475	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1970	1975	5475	7300	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1975	1980	7300	9125	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1980	1985	9125	10950	200	200	200	200	200	200	200	0.1	0.1	0.1	0.1
1985	1990	10950	12775	200	200	200	200	200	200	200	200	200	0.1	0.1
1990	1995	12775	14600	200	200	200	200	200	200	200	200	200	0.1	0.1
1995	2000	14600	16425	200	200	200	200	200	200	200	200	200	0.1	0.1
2000	2005	16425	18250	150	150	150	150	150	150	150	150	150	0.1	0.1
2005	2006	0	365	150	150	150	150	150	150	150	150	150	0.1	0.1
2006	2008	365	1095	100	100	100	100	150	100	150	150	100	0.1	0.1
2008	2010	1095	1825	100	100	100	100	150	100	150	150	100	0.1	0.1
2010	2012	1825	2555	100	100	100	100	100	100	100	100	100	0.1	0.1
2012	2014	2555	3285	100	100	100	100	100	100	100	100	100	0.1	0.1
2014	2016	3285	4015	100	100	100	100	100	100	100	100	100	0.1	0.1
2016	2018	4015	4745	100	100	100	100	100	100	100	100	100	0.1	0.1
2018	2020	4745	5475	100	100	100	100	100	100	100	100	100	0.1	0.1
2020	2022	5475	6205	100	100	100	100	100	100	100	100	100	0.1	0.1
2022	2024	6205	6935	100	100	100	100	100	100	100	100	100	0.1	0.1
2024	2026	6935	7665	100	100	100	100	100	100	100	100	100	0.1	0.1
2026	2028	7665	8395	100	100	100	100	100	100	100	100	100	0.1	0.1
2028	2030	8395	9125	100	100	100	100	100	100	100	100	100	0.1	0.1
2030	2032	9125	9855	100	100	100	100	100	100	100	100	100	0.1	0.1
2032	2034	9855	10585	100	100	100	100	100	100	100	100	100	0.1	0.1
2034	2036	10585	11315	100	100	100	100	100	100	100	100	100	0.1	0.1
2036	2038	11315	12045	100	100	100	100	100	100	100	100	100	0.1	0.1
2038	2040	12045	12775	100	100	100	100	100	100	100	100	100	0.1	0.1

A-8 (S3B-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Lyrup Area)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
2040	**2042**	*12775*	*13505*	100	100	100	100	100	100	100	100	100	0.1	0.1
2042	**2044**	*13505*	*14235*	100	100	100	100	100	100	100	100	100	0.1	0.1
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	100	100	100	0.1	0.1
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100	100	0.1	0.1
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100	100	0.1	0.1
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100	100	0.1	0.1
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100	100	0.1	0.1
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100	100	0.1	0.1
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100	100	0.1	0.1
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100	100	0.1	0.1
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100	100	0.1	0.1
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100	100	0.1	0.1
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100	100	0.1	0.1
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100	100	0.1	0.1
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100	100	0.1	0.1
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100	100	0.1	0.1
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100	100	0.1	0.1
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100	100	0.1	0.1
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100	100	0.1	0.1
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100	100	0.1	0.1
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100	100	0.1	0.1
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100	100	0.1	0.1
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100	100	0.1	0.1
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100	100	0.1	0.1
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100	100	0.1	0.1
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100	100	0.1	0.1
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100	100	0.1	0.1
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100	100	0.1	0.1
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100	100	0.1	0.1
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100	100	0.1	0.1
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100	100	0.1	0.1
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100	100	0.1	0.1

A-8 (S3B-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-3B (Lyrup Area)



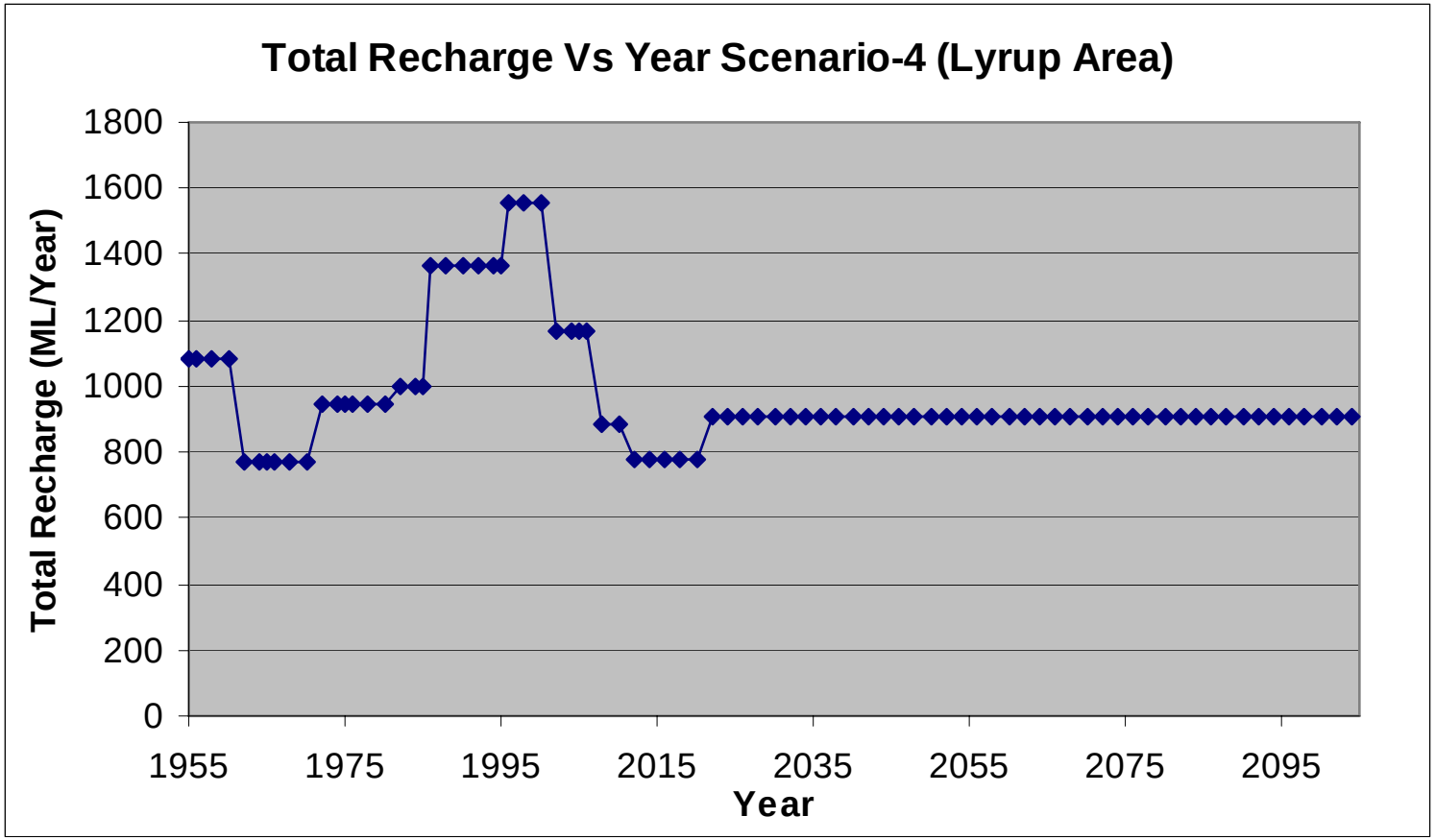
A-8 (S3B-3). Total recharge volume to the Loxton Sands in Scenario-3B (Lyrup Area)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
1885	1935	0	18250	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1935	1945	18250	21900	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1945	1950	21900	23725	500	500	500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1950	1955	23725	25550	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1955	1960	0	1825	400	400	400	400	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1960	1965	1825	3650	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1965	1970	3650	5475	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1	0.1
1970	1975	5475	7300	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1975	1980	7300	9125	220	220	220	220	220	220	0.1	0.1	0.1	0.1	0.1
1980	1985	9125	10950	200	200	200	200	200	200	200	0.1	0.1	0.1	0.1
1985	1990	10950	12775	200	200	200	200	200	200	200	200	200	0.1	0.1
1990	1995	12775	14600	200	200	200	200	200	200	200	200	200	0.1	0.1
1995	2000	14600	16425	200	200	200	200	200	200	200	200	200	200	0.1
2000	2005	16425	18250	150	150	150	150	150	150	150	150	150	150	0.1
2005	2006	0	365	150	150	150	150	150	150	150	150	150	150	0.1
2006	2008	365	1095	100	100	100	100	150	100	150	150	100	100	0.1
2008	2010	1095	1825	100	100	100	100	150	100	150	150	100	100	0.1
2010	2012	1825	2555	100	100	100	100	100	100	100	100	100	100	0.1
2012	2014	2555	3285	100	100	100	100	100	100	100	100	100	100	0.1
2014	2016	3285	4015	100	100	100	100	100	100	100	100	100	100	0.1
2016	2018	4015	4745	100	100	100	100	100	100	100	100	100	100	0.1
2018	2020	4745	5475	100	100	100	100	100	100	100	100	100	100	0.1
2020	2022	5475	6205	100	100	100	100	100	100	100	100	100	100	100
2022	2024	6205	6935	100	100	100	100	100	100	100	100	100	100	100
2024	2026	6935	7665	100	100	100	100	100	100	100	100	100	100	100
2026	2028	7665	8395	100	100	100	100	100	100	100	100	100	100	100
2028	2030	8395	9125	100	100	100	100	100	100	100	100	100	100	100
2030	2032	9125	9855	100	100	100	100	100	100	100	100	100	100	100
2032	2034	9855	10585	100	100	100	100	100	100	100	100	100	100	100
2034	2036	10585	11315	100	100	100	100	100	100	100	100	100	100	100
2036	2038	11315	12045	100	100	100	100	100	100	100	100	100	100	100
2038	2040	12045	12775	100	100	100	100	100	100	100	100	100	100	100

A-8 (S4-1). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Lyrup Area)

Irrigation Start year				1880-1920	1930	1940	1950	1950	1970	1970	1975	1980	1990	2000
Lag time (yrs)				5	5	5	5	10	5	10	10	5	5	20
Start Year	Stop Year	Start Day	Stop Day	Zone 40	Zone 41	Zone 42	Zone 43	Zone 44	Zone 45	Zone 46	Zone 47	Zone 48	Zone 49	Zone 50
2040	**2042**	*12775*	*13505*	100	100	100	100	100	100	100	100	100	100	100
2042	**2044**	*13505*	*14235*	100	100	100	100	100	100	100	100	100	100	100
2044	**2046**	*14235*	*14965*	100	100	100	100	100	100	100	100	100	100	100
2046	**2048**	*14965*	*15695*	100	100	100	100	100	100	100	100	100	100	100
2048	**2050**	*15695*	*16425*	100	100	100	100	100	100	100	100	100	100	100
2050	**2052**	*16425*	*17155*	100	100	100	100	100	100	100	100	100	100	100
2052	**2054**	*17155*	*17885*	100	100	100	100	100	100	100	100	100	100	100
2054	**2056**	*17885*	*18615*	100	100	100	100	100	100	100	100	100	100	100
2056	**2058**	*18615*	*19345*	100	100	100	100	100	100	100	100	100	100	100
2058	**2060**	*19345*	*20075*	100	100	100	100	100	100	100	100	100	100	100
2060	**2062**	*20075*	*20805*	100	100	100	100	100	100	100	100	100	100	100
2062	**2064**	*20805*	*21535*	100	100	100	100	100	100	100	100	100	100	100
2064	**2066**	*21535*	*22265*	100	100	100	100	100	100	100	100	100	100	100
2066	**2068**	*22265*	*22995*	100	100	100	100	100	100	100	100	100	100	100
2068	**2070**	*22995*	*23725*	100	100	100	100	100	100	100	100	100	100	100
2070	**2072**	*23725*	*24455*	100	100	100	100	100	100	100	100	100	100	100
2072	**2074**	*24455*	*25185*	100	100	100	100	100	100	100	100	100	100	100
2074	**2076**	*25185*	*25915*	100	100	100	100	100	100	100	100	100	100	100
2076	**2078**	*25915*	*26645*	100	100	100	100	100	100	100	100	100	100	100
2078	**2080**	*26645*	*27375*	100	100	100	100	100	100	100	100	100	100	100
2080	**2082**	*27375*	*28105*	100	100	100	100	100	100	100	100	100	100	100
2082	**2084**	*28105*	*28835*	100	100	100	100	100	100	100	100	100	100	100
2084	**2086**	*28835*	*29565*	100	100	100	100	100	100	100	100	100	100	100
2086	**2088**	*29565*	*30295*	100	100	100	100	100	100	100	100	100	100	100
2088	**2090**	*30295*	*31025*	100	100	100	100	100	100	100	100	100	100	100
2090	**2092**	*31025*	*31755*	100	100	100	100	100	100	100	100	100	100	100
2092	**2094**	*31755*	*32485*	100	100	100	100	100	100	100	100	100	100	100
2094	**2096**	*32485*	*33215*	100	100	100	100	100	100	100	100	100	100	100
2096	**2098**	*33215*	*33945*	100	100	100	100	100	100	100	100	100	100	100
2098	**2100**	*33945*	*34675*	100	100	100	100	100	100	100	100	100	100	100
2100	**2102**	*34675*	*35405*	100	100	100	100	100	100	100	100	100	100	100
2102	**2104**	*35405*	*36135*	100	100	100	100	100	100	100	100	100	100	100

A-8 (S4-2). Model recharge zones, irrigation start time, lag time and recharge rates in Scenario-4 (Lyrup Area)



A-8 (S4-3). Total recharge volume to the Loxton Sands in Scenario-4 (Lyrup Area)

B. MODEL OUTPUTS

B-1. MODEL OUTPUT – MURTHO AREA

- Summary of annual salt loads
- Flow budget zones
- Modelled groundwater flux (m^3/day)
- Modelled Salt load (tonnes/day)

(All Scenarios)

- SIS well locations and predicted pumping rates (L/sec)

(Scenario-6 only)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

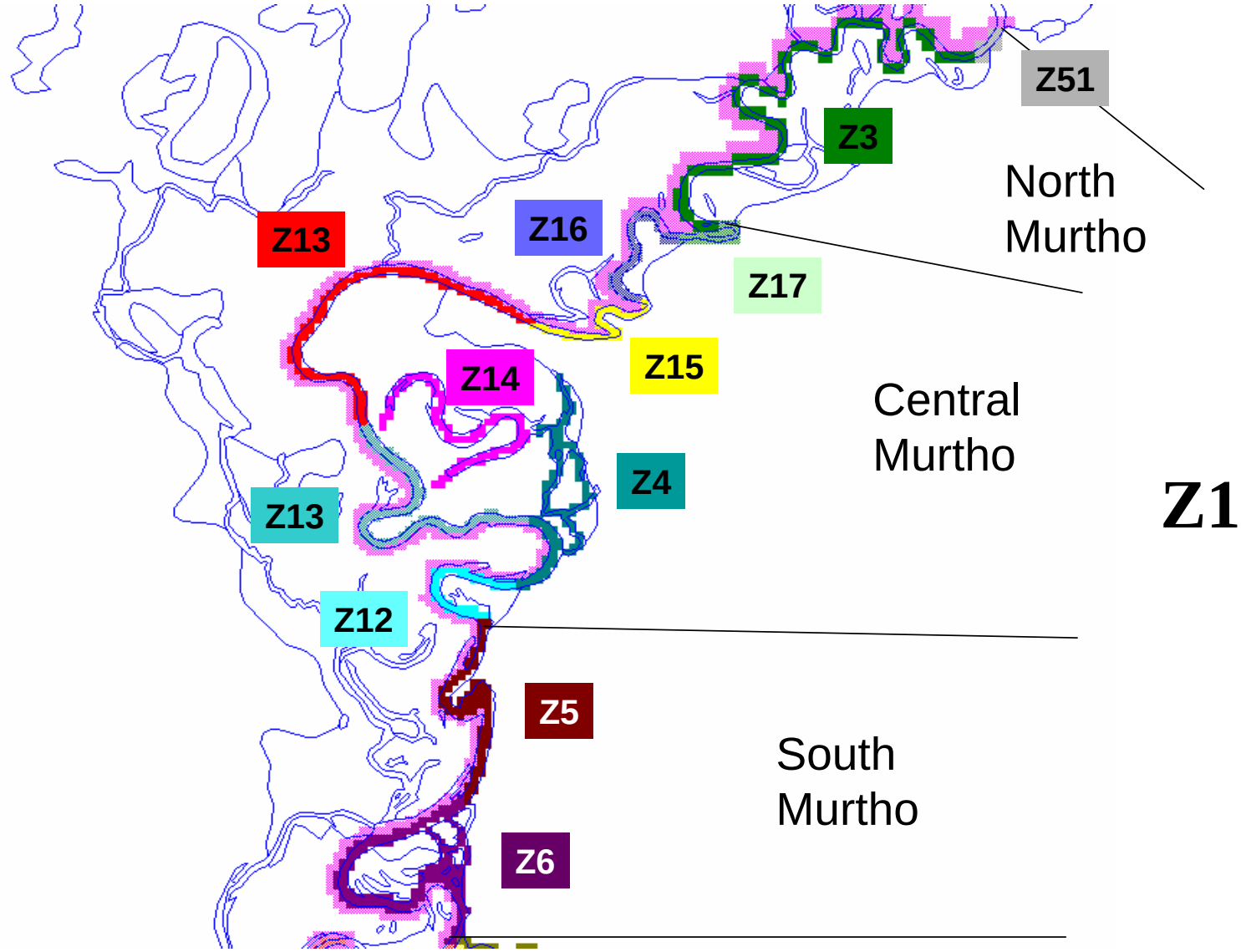
B-1. Model Scenario conditions

Time	S-1	S-2	S-3A	S-3B	S-3C	S-4	S-5	S-6
1988	32.0	32.7	99.5	99.5	99.5	99.5	99.5	99.5
1989	32.0	32.7	102.0	102.0	102.0	102.0	102.0	102.0
1990	32.0	32.7	104.4	104.4	104.4	104.4	104.4	104.4
1991	32.0	32.8	108.9	108.9	108.9	108.9	108.9	108.9
1992	32.0	32.8	113.5	113.5	113.5	113.5	113.5	113.5
1993	32.0	32.8	115.3	115.3	115.3	115.3	115.3	115.3
1994	32.0	32.8	117.0	117.0	117.0	117.0	117.0	117.0
1995	32.0	32.8	118.6	118.6	118.6	118.6	118.6	118.6
1996	32.0	32.8	120.2	120.2	120.2	120.2	120.2	120.2
1997	32.0	32.8	121.2	121.2	121.2	121.2	121.2	121.2
1998	32.0	32.8	122.1	122.1	122.1	122.1	122.1	122.1
1999	32.0	32.9	122.8	122.8	122.8	122.8	122.8	122.8
2000	32.0	32.9	123.6	123.5	123.5	123.5	123.5	123.5
2001	32.0	32.9	127.1	121.8	121.8	121.8	121.8	121.8
2002	32.0	33.0	130.7	120.0	120.0	120.0	120.0	120.0
2003	32.0	33.0	132.4	113.1	113.1	113.1	113.1	113.1
2004	32.0	33.0	134.2	106.2	106.2	106.2	106.2	106.2
2005	32.0	33.0	135.2	103.0	103.0	103.0	103.0	103.0
2006	32.0	33.0	145.9	111.0	111.0	111.0	111.0	37.2
2007	32.0	33.0	151.8	112.3	112.3	112.3	112.3	37.1
2008	32.0	33.0	157.8	113.6	113.6	113.6	113.6	36.9
2009	32.0	33.0	161.5	115.5	115.5	116.0	116.0	37.3
2010	32.0	33.0	165.3	117.3	117.3	118.4	118.4	37.6
2011	32.0	33.1	169.8	119.3	119.3	120.8	120.8	38.5
2012	32.0	33.1	174.4	121.3	121.3	123.1	123.1	39.3
2013	32.0	33.1	178.0	122.7	122.7	124.6	124.6	39.8
2014	32.0	33.1	181.6	124.0	124.0	126.1	126.1	40.3
2015	32.0	33.1	184.5	124.9	124.9	127.1	127.1	40.6
2016	32.0	33.2	187.4	125.8	125.8	128.1	128.1	40.8
2017	32.0	33.2	189.8	126.4	126.4	128.5	128.5	41.0
2018	32.0	33.2	192.2	127.0	127.0	128.8	128.8	41.1
2019	32.0	33.2	194.2	127.3	127.3	129.0	129.0	41.2
2020	32.0	33.2	196.1	127.7	127.7	129.3	129.3	41.3
2021	32.0	33.2	202.8	132.3	132.3	134.1	134.1	40.6
2022	32.0	33.3	209.4	136.9	136.9	139.0	139.0	39.8
2023	32.0	33.3	216.0	141.5	141.5	143.8	143.8	40.6
2024	32.0	33.3	222.6	146.2	146.2	148.6	148.6	41.4
2025	32.0	33.3	227.5	149.3	149.3	151.8	151.8	41.9
2026	32.0	33.3	232.4	152.5	152.5	155.0	155.0	42.4
2027	32.0	33.4	236.2	154.5	154.5	157.1	157.1	42.7
2028	32.0	33.4	240.0	156.5	156.5	159.1	159.1	43.0
2029	32.0	33.4	243.2	158.2	158.2	160.9	160.9	43.3
2030	32.0	33.4	246.3	159.9	159.9	162.6	162.6	43.5
2031	32.0	33.4	248.9	158.9	158.9	161.6	161.6	37.5
2032	32.0	33.5	251.6	157.8	157.8	160.5	160.5	31.5
2033	32.0	33.5	253.8	158.0	158.0	160.8	160.8	31.3
2034	32.0	33.6	256.1	158.3	158.3	161.1	161.1	31.1
2035	32.0	33.6	258.1	158.7	158.7	161.8	161.8	31.0
2036	32.0	33.6	260.1	159.1	159.1	162.6	162.6	30.9
2037	32.0	33.6	261.8	159.5	159.5	165.1	165.1	31.1
2038	32.0	33.6	263.6	159.9	159.9	167.6	167.6	31.2
2039	32.0	33.6	265.2	160.3	160.3	169.2	169.2	31.3
2040	32.0	33.6	266.7	160.6	160.6	170.8	170.8	31.4
2041	32.0	33.7	268.1	157.2	157.2	170.1	170.1	29.7
2042	32.0	33.8	269.5	153.7	153.7	169.4	169.4	28.0
2043	32.0	33.8	270.8	151.0	151.0	169.4	169.4	28.3
2044	32.0	33.9	272.0	148.2	148.2	169.3	169.3	28.5
2045	32.0	33.9	273.2	146.5	146.5	169.7	169.7	28.7
2046	32.0	33.9	274.3	144.8	144.8	170.0	170.0	28.8

B-1. Predicted annual salt load for all scenarios (Murtho area)

Time	S-1	S-2	S-3A	S-3B	S-3C	S-4	S-5	S-6
2047	32.0	33.9	275.4	143.5	143.5	170.6	170.6	29.0
2048	32.0	34.0	276.4	142.2	142.2	171.2	171.2	29.2
2049	32.0	34.0	277.4	141.3	141.3	172.6	172.6	29.4
2050	32.0	34.0	278.3	140.4	140.4	174.0	174.0	29.6
2051	32.0	34.1	279.2	139.8	139.8	175.8	175.8	29.7
2052	32.0	34.2	280.1	139.2	139.2	177.5	177.5	29.8
2053	32.0	34.2	280.9	138.8	138.8	179.2	179.2	30.0
2054	32.0	34.3	281.7	138.4	138.4	180.9	180.9	30.2
2055	32.0	34.3	282.4	138.1	138.1	182.6	184.1	30.6
2056	32.0	34.4	283.1	137.8	137.8	184.3	187.4	31.0
2057	32.0	34.4	283.8	137.6	137.6	186.1	190.5	31.5
2058	32.0	34.4	284.5	137.5	137.5	187.9	193.7	31.9
2059	32.0	34.5	285.2	137.3	137.3	189.6	197.0	32.4
2060	32.0	34.5	285.8	137.2	137.2	191.3	200.2	32.8
2061	32.0	34.6	286.4	137.1	137.1	192.9	203.3	33.3
2062	32.0	34.7	287.0	137.0	137.0	194.5	206.5	33.7
2063	32.0	34.8	287.5	137.0	137.0	196.0	209.4	34.1
2064	32.0	34.9	288.1	136.9	136.9	197.4	212.3	34.5
2065	32.0	34.9	288.6	136.9	136.9	198.8	220.5	36.0
2066	32.0	35.0	289.1	136.9	136.9	200.2	228.7	37.5
2067	32.0	35.1	289.6	136.9	136.9	201.6	236.3	39.0
2068	32.0	35.1	290.1	136.9	136.9	202.9	243.9	40.4
2069	32.0	35.2	290.6	136.9	136.9	204.3	250.5	41.7
2070	32.0	35.3	291.0	136.9	136.9	205.6	257.1	43.0
2071	32.0	35.4	291.4	136.9	136.9	207.0	263.0	44.1
2072	32.0	35.5	291.9	136.9	136.9	208.3	268.9	45.3
2073	32.0	35.6	292.3	136.9	136.9	209.6	274.2	46.3
2074	32.0	35.7	292.7	136.9	136.9	210.9	279.6	47.4
2075	32.0	35.8	293.1	137.0	137.0	212.2	285.8	48.9
2076	32.0	35.9	293.4	137.0	137.0	213.4	292.1	50.5
2077	32.0	36.0	293.8	137.0	137.0	214.6	298.5	52.1
2078	32.0	36.1	294.2	137.1	137.1	215.7	304.9	53.8
2079	32.0	36.1	294.5	137.1	137.1	216.8	310.5	55.2
2080	32.0	36.2	294.9	137.1	137.1	217.9	316.0	56.6
2081	32.0	36.4	295.2	137.2	137.2	218.9	320.8	57.8
2082	32.0	36.5	295.5	137.2	137.2	219.9	325.7	59.0
2083	32.0	36.6	295.8	137.3	137.3	220.8	329.9	60.1
2084	32.0	36.8	296.1	137.3	137.3	221.8	334.1	61.2
2085	32.0	36.9	296.4	137.4	137.4	222.6	337.9	62.1
2086	32.0	37.0	296.7	137.4	137.4	223.5	341.7	63.1
2087	32.0	37.1	297.0	137.5	137.5	224.3	345.1	64.0
2088	32.0	37.2	297.3	137.5	137.5	225.1	348.6	65.0
2089	32.0	37.3	297.5	137.5	137.5	225.9	351.9	65.8
2090	32.0	37.4	297.8	137.6	137.6	226.6	355.1	66.7
2091	32.0	37.6	298.0	137.6	137.6	227.3	358.1	67.5
2092	32.0	37.8	298.3	137.7	137.7	228.0	361.1	68.3
2093	32.0	37.9	298.5	137.7	137.7	228.7	363.9	69.1
2094	32.0	38.1	298.8	137.8	137.8	229.3	366.7	69.8
2095	32.0	38.2	299.0	137.8	137.8	229.9	369.3	70.5
2096	32.0	38.4	299.2	137.9	137.9	230.5	371.8	71.2
2097	32.0	38.5	299.5	137.9	137.9	231.1	374.2	71.9
2098	32.0	38.6	299.7	138.0	138.0	231.7	376.6	72.6
2099	32.0	38.8	299.9	138.0	138.0	232.2	378.8	73.2
2100	32.0	38.9	300.1	138.0	138.0	232.7	381.1	73.8
2101	32.0	39.1	300.3	138.1	138.1	233.2	383.1	74.4
2102	32.0	39.3	300.5	138.1	138.1	233.8	385.2	74.9
2103	32.0	39.4	300.7	138.2	138.2	234.2	387.1	75.5
2104	32.0	39.6	300.9	138.2	138.2	234.7	389.0	76.0
2105	32.0	39.6	300.9	138.2	138.2	234.7	389.0	76.0

B-1. Predicted annual salt load for all scenarios (Murtho area)



B-1. Model flow budget zones in the Murtho Area (layer 1)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
3650	1930	444	282	726	21	12	49	18	17	5	184	2	306	6	75	81	1113
7300	1940	444	282	726	21	13	49	19	17	5	187	2	312	6	75	81	1120
10950	1950	443	282	726	21	13	49	19	17	5	189	2	315	6	75	81	1123
14600	1960	443	282	726	22	13	49	19	17	5	192	2	319	6	75	81	1126
18250	1970	443	283	726	22	13	50	20	17	5	194	2	323	7	75	82	1130
21900	1980	443	283	726	22	13	50	20	18	5	197	2	327	7	75	82	1135
24820	1988	443	283	727	22	13	50	20	18	5	200	2	331	8	75	82	1140
25550	1990	443	284	727	22	13	50	20	18	5	200	2	331	8	75	83	1140
26280	1992	443	284	727	23	13	50	20	18	5	202	2	334	8	75	83	1144
27010	1994	443	284	727	23	13	50	20	18	5	202	2	334	8	75	83	1144
27740	1996	443	284	727	23	13	50	20	18	5	202	2	335	8	75	83	1145
28470	1998	443	284	728	23	13	50	20	18	5	202	2	335	8	75	83	1145
29200	2000	443	284	728	23	13	50	20	18	5	203	2	335	8	75	83	1145
29930	2002	443	285	728	23	13	50	21	18	5	204	2	338	8	75	83	1149
30660	2004	443	285	728	23	13	50	21	18	5	205	2	339	8	75	83	1150
31390	2006	443	285	728	23	13	50	21	18	5	205	2	339	8	75	83	1150
32120	2008	443	285	728	23	13	51	21	18	5	205	2	339	8	75	83	1150
32850	2010	443	285	728	23	13	51	21	18	5	205	2	339	8	75	83	1151
33580	2012	443	285	728	24	13	51	21	19	5	207	2	342	8	75	83	1154
34310	2014	443	285	729	24	13	51	21	19	5	208	2	343	8	75	83	1155
35040	2016	443	285	729	24	13	51	21	19	5	208	2	344	8	75	83	1156
35770	2018	443	285	729	24	13	51	21	19	5	208	2	344	9	75	83	1156
36500	2020	443	286	729	24	13	51	21	19	5	208	2	344	9	75	83	1156
37230	2022	443	286	729	24	13	51	22	19	5	210	3	348	9	75	84	1160
37960	2024	443	286	729	24	13	51	22	19	6	211	3	349	9	75	84	1162
38690	2026	443	286	729	24	13	51	22	19	6	211	3	349	9	75	84	1162
39420	2028	443	286	729	24	13	51	22	19	6	212	3	350	9	75	84	1163
40150	2030	443	286	730	24	13	51	22	19	6	212	3	350	9	75	84	1164
40880	2032	443	287	730	25	14	51	22	19	6	214	3	354	10	75	84	1168
41610	2034	443	287	730	25	14	51	22	19	6	215	3	355	10	75	85	1170
42340	2036	443	287	730	25	14	51	22	19	6	216	3	356	10	75	85	1171
43070	2038	443	287	730	25	14	51	22	19	6	216	3	357	10	75	85	1172
43800	2040	443	287	730	25	14	52	22	19	6	217	3	357	10	75	85	1173
44530	2042	443	288	731	26	14	52	23	20	6	219	3	361	11	75	86	1178
45260	2044	443	288	731	26	14	52	23	20	6	220	3	363	11	75	86	1180

B-1 (S2-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-2 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
45990	2046	443	288	731	26	14	52	23	20	6	221	3	365	11	75	86	1182
46720	2048	443	288	732	26	14	52	23	20	6	223	3	366	12	75	86	1184
47450	2050	443	288	732	26	14	52	23	20	6	224	3	367	12	75	87	1186
48180	2052	443	289	732	26	14	52	23	20	6	226	3	372	13	75	87	1191
48910	2054	443	289	733	26	14	53	24	20	6	228	3	374	13	75	88	1195
49640	2056	444	290	733	26	14	53	24	21	6	230	3	376	13	75	88	1198
50370	2058	444	290	734	26	14	53	24	21	6	231	3	379	14	75	89	1201
51100	2060	444	290	734	27	14	53	24	21	6	233	3	381	14	75	89	1204
51830	2062	444	291	735	27	14	54	24	21	6	236	3	386	15	75	90	1211
52560	2064	444	292	736	27	14	54	24	21	6	239	3	390	16	75	91	1216
53290	2066	444	292	736	27	14	54	24	21	6	242	3	393	17	75	91	1221
54020	2068	444	293	737	27	15	55	24	22	6	244	4	396	17	75	92	1225
54750	2070	444	293	738	27	15	55	25	22	7	246	4	400	18	75	93	1230
55480	2072	444	294	739	27	15	56	25	22	7	251	4	406	19	75	94	1238
56210	2074	445	295	740	28	15	56	25	22	7	254	4	411	20	75	95	1245
56940	2076	445	296	741	28	15	56	25	23	7	257	4	415	21	75	96	1252
57670	2078	445	297	742	28	15	57	25	23	7	261	4	420	22	75	96	1258
58400	2080	445	298	743	28	15	57	26	23	7	264	4	424	22	75	97	1264
59130	2082	445	299	745	28	15	58	26	24	7	269	4	431	24	75	99	1275
59860	2084	446	301	746	29	15	59	26	24	7	273	4	437	25	75	100	1283
60590	2086	446	302	748	29	15	60	26	24	7	277	5	443	26	75	101	1292
61320	2088	446	303	750	29	15	60	26	24	7	281	5	448	27	75	102	1300
62050	2090	447	304	751	29	16	61	27	24	8	285	5	454	27	75	103	1307
62780	2092	447	306	753	29	16	62	27	25	8	290	5	462	29	75	104	1319
63510	2094	448	308	755	30	16	63	27	25	8	295	5	469	30	76	106	1330
64240	2096	448	309	758	30	16	63	27	25	8	300	5	476	31	76	107	1340
64970	2098	449	311	760	30	16	64	28	26	8	305	5	482	32	76	108	1349
65700	2100	449	313	762	31	16	65	28	26	8	309	5	488	33	76	109	1359
66430	2102	450	314	764	31	16	66	28	26	8	315	6	497	34	76	111	1372
67160	2104	450	317	767	31	17	67	28	27	9	320	6	505	36	77	112	1384
67890	2106	451	319	770	32	17	68	28	27	9	326	6	512	37	77	114	1396
69350	2110	452	321	773	32	17	70	28	27	8	335	6	523	39	77	116	1412
73000	2120	456	333	788	34	18	75	29	28	9	363	7	563	44	79	123	1474
82125	2145	465	356	821	38	19	85	30	31	11	415	8	638	53	81	134	1592

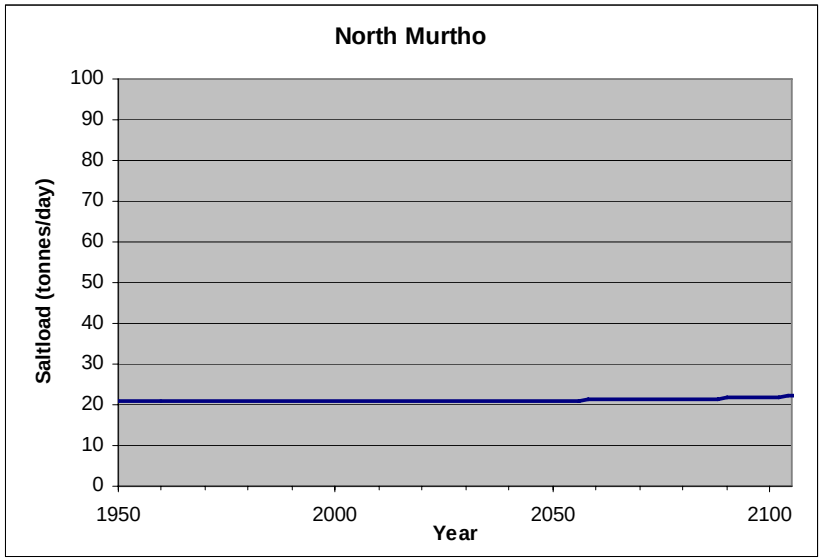
B-1 (S2-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-2 (Murtho Area)

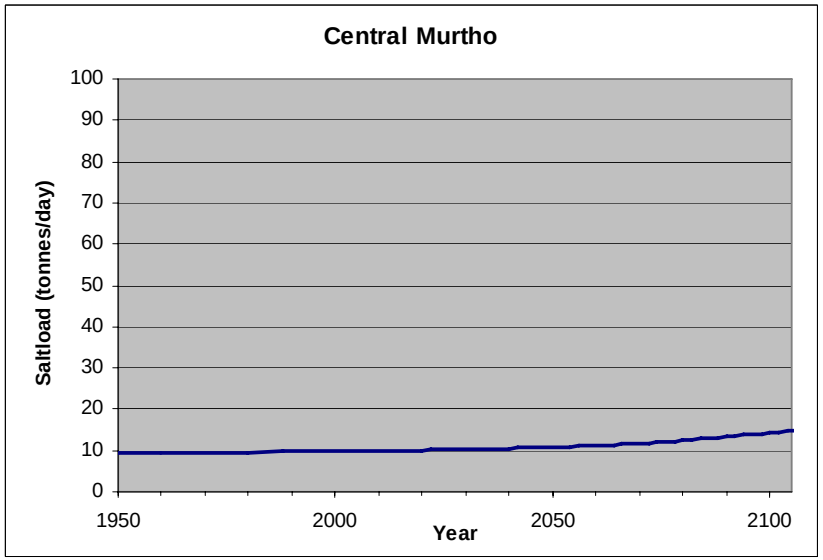
Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
3650	1930	13.3	7.6	20.9	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.1	1.9	2.0	31.9
7300	1940	13.3	7.6	20.9	0.6	0.4	1.5	0.8	0.2	0.0	5.6	0.0	9.2	0.2	1.9	2.0	32.1
10950	1950	13.3	7.6	20.9	0.6	0.4	1.5	0.8	0.2	0.0	5.7	0.0	9.2	0.2	1.9	2.0	32.2
14600	1960	13.3	7.6	20.9	0.7	0.4	1.5	0.8	0.2	0.0	5.8	0.0	9.4	0.2	1.9	2.0	32.3
18250	1970	13.3	7.6	20.9	0.7	0.4	1.5	0.8	0.2	0.0	5.8	0.0	9.5	0.2	1.9	2.0	32.4
21900	1980	13.3	7.6	20.9	0.7	0.4	1.5	0.9	0.2	0.0	5.9	0.1	9.6	0.2	1.9	2.1	32.6
24820	1988	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.0	0.1	9.7	0.2	1.9	2.1	32.7
25550	1990	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.0	0.1	9.7	0.2	1.9	2.1	32.7
26280	1992	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.8	0.2	1.9	2.1	32.8
27010	1994	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.8	0.2	1.9	2.1	32.8
27740	1996	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.8	0.2	1.9	2.1	32.8
28470	1998	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.8	0.2	1.9	2.1	32.8
29200	2000	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.8	0.2	1.9	2.1	32.9
29930	2002	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.9	0.2	1.9	2.1	33.0
30660	2004	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.1	0.1	9.9	0.2	1.9	2.1	33.0
31390	2006	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	9.9	0.2	1.9	2.1	33.0
32120	2008	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	9.9	0.2	1.9	2.1	33.0
32850	2010	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	9.9	0.2	1.9	2.1	33.0
33580	2012	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	10.0	0.2	1.9	2.1	33.1
34310	2014	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	10.1	0.2	1.9	2.1	33.1
35040	2016	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	10.1	0.2	1.9	2.1	33.2
35770	2018	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	10.1	0.2	1.9	2.1	33.2
36500	2020	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.2	0.1	10.1	0.2	1.9	2.1	33.2
37230	2022	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.3	0.1	10.2	0.2	1.9	2.1	33.3
37960	2024	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.3	0.1	10.2	0.2	1.9	2.1	33.3
38690	2026	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.3	0.1	10.2	0.2	1.9	2.1	33.3
39420	2028	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.0	6.4	0.1	10.2	0.2	1.9	2.1	33.4
40150	2030	13.3	7.7	21.0	0.7	0.4	1.5	0.9	0.2	0.1	6.4	0.1	10.3	0.2	1.9	2.1	33.4
40880	2032	13.3	7.7	21.0	0.7	0.4	1.5	1.0	0.2	0.1	6.4	0.1	10.4	0.2	1.9	2.1	33.5
41610	2034	13.3	7.7	21.0	0.8	0.4	1.5	1.0	0.2	0.1	6.5	0.1	10.4	0.2	1.9	2.1	33.6
42340	2036	13.3	7.7	21.0	0.8	0.4	1.5	1.0	0.2	0.1	6.5	0.1	10.4	0.2	1.9	2.1	33.6
43070	2038	13.3	7.8	21.0	0.8	0.4	1.5	1.0	0.2	0.1	6.5	0.1	10.4	0.3	1.9	2.1	33.6
43800	2040	13.3	7.8	21.1	0.8	0.4	1.5	1.0	0.2	0.1	6.5	0.1	10.5	0.3	1.9	2.1	33.6
44530	2042	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.6	0.1	10.6	0.3	1.9	2.1	33.8
45260	2044	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.6	0.1	10.6	0.3	1.9	2.1	33.9
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

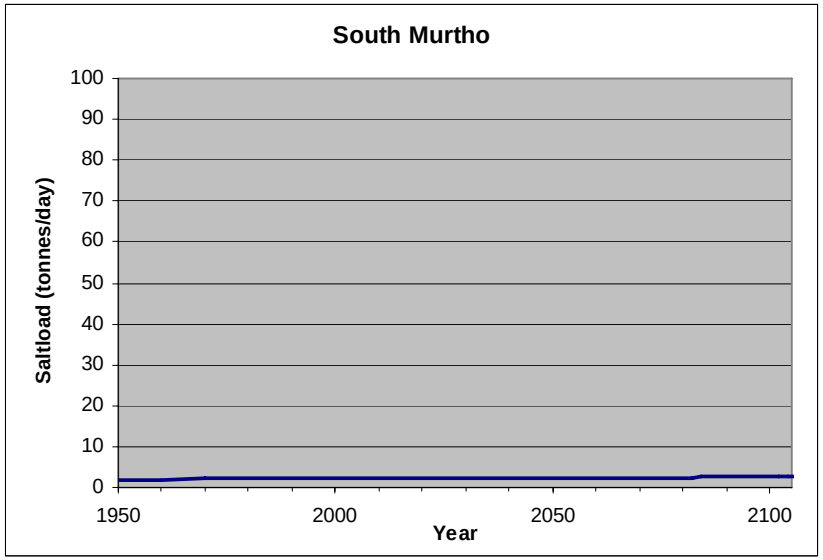
B-1 (S2-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-2 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
45990	2046	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.6	0.1	10.7	0.3	1.9	2.2	33.9
46720	2048	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.7	0.1	10.7	0.3	1.9	2.2	34.0
47450	2050	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.7	0.1	10.8	0.3	1.9	2.2	34.0
48180	2052	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.8	0.1	10.9	0.3	1.9	2.2	34.2
48910	2054	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.8	0.1	11.0	0.3	1.9	2.2	34.3
49640	2056	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.9	0.1	11.0	0.3	1.9	2.2	34.4
50370	2058	13.3	7.8	21.1	0.8	0.4	1.6	1.0	0.2	0.1	6.9	0.1	11.1	0.3	1.9	2.2	34.4
51100	2060	13.3	7.8	21.2	0.8	0.4	1.6	1.0	0.2	0.1	7.0	0.1	11.2	0.4	1.9	2.2	34.5
51830	2062	13.3	7.9	21.2	0.8	0.4	1.6	1.0	0.2	0.1	7.1	0.1	11.3	0.4	1.9	2.2	34.7
52560	2064	13.3	7.9	21.2	0.8	0.4	1.6	1.0	0.2	0.1	7.2	0.1	11.4	0.4	1.9	2.3	34.9
53290	2066	13.3	7.9	21.2	0.8	0.4	1.6	1.0	0.2	0.1	7.2	0.1	11.5	0.4	1.9	2.3	35.0
54020	2068	13.3	7.9	21.2	0.8	0.4	1.6	1.1	0.2	0.1	7.3	0.1	11.6	0.4	1.9	2.3	35.1
54750	2070	13.3	7.9	21.2	0.8	0.4	1.6	1.1	0.2	0.1	7.4	0.1	11.7	0.4	1.9	2.3	35.3
55480	2072	13.3	7.9	21.3	0.8	0.4	1.7	1.1	0.2	0.1	7.5	0.1	11.9	0.5	1.9	2.3	35.5
56210	2074	13.3	8.0	21.3	0.8	0.4	1.7	1.1	0.2	0.1	7.6	0.1	12.0	0.5	1.9	2.4	35.7
56940	2076	13.3	8.0	21.3	0.8	0.4	1.7	1.1	0.2	0.1	7.7	0.1	12.2	0.5	1.9	2.4	35.9
57670	2078	13.3	8.0	21.4	0.8	0.4	1.7	1.1	0.2	0.1	7.8	0.1	12.3	0.5	1.9	2.4	36.1
58400	2080	13.4	8.0	21.4	0.8	0.4	1.7	1.1	0.2	0.1	7.9	0.1	12.4	0.6	1.9	2.4	36.2
59130	2082	13.4	8.1	21.4	0.8	0.5	1.7	1.1	0.2	0.1	8.1	0.1	12.6	0.6	1.9	2.5	36.5
59860	2084	13.4	8.1	21.5	0.9	0.5	1.8	1.1	0.2	0.1	8.2	0.1	12.8	0.6	1.9	2.5	36.8
60590	2086	13.4	8.2	21.5	0.9	0.5	1.8	1.1	0.2	0.1	8.3	0.1	13.0	0.6	1.9	2.5	37.0
61320	2088	13.4	8.2	21.6	0.9	0.5	1.8	1.1	0.2	0.1	8.4	0.1	13.1	0.7	1.9	2.5	37.2
62050	2090	13.4	8.2	21.6	0.9	0.5	1.8	1.1	0.2	0.1	8.6	0.1	13.3	0.7	1.9	2.6	37.4
62780	2092	13.4	8.3	21.7	0.9	0.5	1.9	1.2	0.2	0.1	8.7	0.1	13.5	0.7	1.9	2.6	37.8
63510	2094	13.4	8.3	21.7	0.9	0.5	1.9	1.2	0.2	0.1	8.9	0.1	13.7	0.7	1.9	2.6	38.1
64240	2096	13.4	8.4	21.8	0.9	0.5	1.9	1.2	0.2	0.1	9.0	0.1	13.9	0.8	1.9	2.7	38.4
64970	2098	13.5	8.4	21.9	0.9	0.5	1.9	1.2	0.2	0.1	9.1	0.1	14.1	0.8	1.9	2.7	38.6
65700	2100	13.5	8.4	21.9	0.9	0.5	1.9	1.2	0.2	0.1	9.3	0.1	14.3	0.8	1.9	2.7	38.9
66430	2102	13.5	8.5	22.0	0.9	0.5	2.0	1.2	0.2	0.1	9.4	0.1	14.5	0.9	1.9	2.8	39.3
67160	2104	13.5	8.5	22.1	0.9	0.5	2.0	1.2	0.2	0.1	9.6	0.1	14.7	0.9	1.9	2.8	39.6
67890	2106	13.5	8.6	22.1	0.9	0.5	2.0	1.2	0.2	0.1	9.8	0.1	15.0	0.9	1.9	2.8	39.9
69350	2110	13.6	8.7	22.2	1.0	0.5	2.1	1.2	0.2	0.1	10.0	0.1	15.3	1.0	1.9	2.9	40.4
73000	2120	13.7	9.0	22.7	1.0	0.5	2.3	1.2	0.3	0.1	10.9	0.2	16.4	1.1	2.0	3.1	42.2
82125	2145	13.9	9.6	23.6	1.1	0.6	2.6	1.3	0.3	0.1	12.5	0.2	18.6	1.3	2.0	3.4	45.5
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

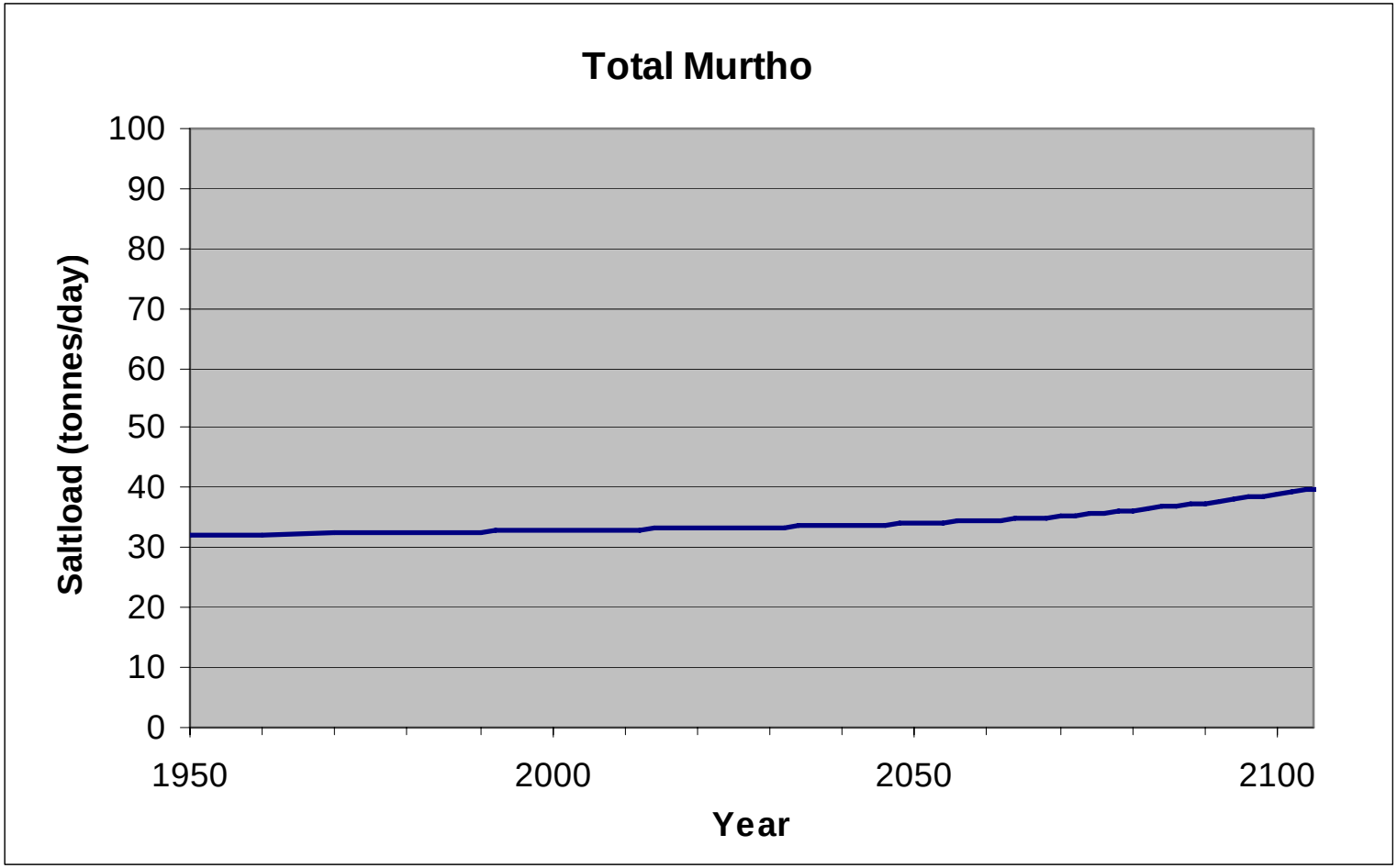
B-1 (S2-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-2 (Murtho Area)







B-1 (S2-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-2 (Murtho Area)



B-1 (S2-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-2 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
30	1955	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
365	1956	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
1095	1958	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
1825	1960	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
2555	1962	444	283	727	21	12	49	19	18	6	273	2	398	6	75	81	1207
3285	1964	444	283	727	21	12	49	19	18	6	279	2	405	6	75	81	1214
3650	1965	444	283	727	21	12	49	19	18	6	281	2	407	6	75	81	1216
4015	1966	444	283	727	21	12	49	19	18	6	282	2	408	6	75	81	1217
4745	1968	444	283	727	21	12	49	19	18	6	283	2	410	6	75	81	1219
5475	1970	444	283	727	21	12	49	19	18	6	284	2	411	6	75	81	1220
6205	1972	444	284	727	21	12	50	19	24	11	670	2	810	151	83	233	1771
6935	1974	444	284	728	21	12	53	19	27	12	720	3	867	181	88	268	1863
7300	1975	444	284	728	21	12	54	19	27	12	733	3	883	188	89	277	1888
7665	1976	444	284	728	21	12	56	19	28	13	754	3	906	194	90	284	1918
8395	1978	444	284	728	21	13	62	20	31	14	805	4	968	202	92	294	1989
9125	1980	444	284	728	21	13	67	20	32	14	837	4	1009	207	93	300	2037
9855	1982	444	285	729	22	14	212	21	41	16	1023	30	1380	323	124	448	2556
10585	1984	444	286	730	24	16	235	22	47	18	1097	35	1494	345	135	480	2703
10950	1985	444	286	730	24	17	241	23	49	18	1119	36	1527	350	138	488	2745
11315	1986	505	441	946	25	19	344	23	54	19	1183	37	1703	355	129	484	3133
12045	1988	510	555	1066	30	26	450	25	68	21	1302	38	1961	361	125	485	3512
12775	1990	513	585	1098	37	33	489	27	76	23	1373	38	2095	365	125	489	3683
13505	1992	508	583	1091	123	42	624	29	85	24	1445	39	2410	368	125	493	3993
14235	1994	508	592	1101	137	48	647	30	90	25	1504	39	2520	370	126	496	4117
14600	1995	509	597	1105	141	50	654	30	92	26	1525	39	2557	371	126	498	4160
14965	1996	509	601	1110	144	52	691	31	93	26	1543	40	2619	372	127	499	4227
15695	1998	509	608	1118	148	54	705	31	95	26	1575	40	2675	374	127	502	4294
16425	2000	510	615	1125	152	56	713	31	97	27	1599	40	2715	376	128	504	4344
17155	2002	512	813	1325	158	59	738	32	99	27	1621	40	2774	378	128	506	4605
17885	2004	516	883	1398	163	62	751	32	100	28	1644	41	2821	379	129	508	4727
18250	2005	517	899	1416	165	63	756	32	101	28	1654	41	2841	380	129	509	4765
365	2006	518	911	1429	170	64	763	32	104	29	1883	41	3086	425	206	631	5146
1095	2008	520	931	1451	181	66	794	33	114	33	2098	44	3364	471	289	760	5575
1825	2010	521	947	1469	190	70	822	35	121	35	2222	48	3543	509	325	834	5845
2555	2012	523	961	1484	196	73	842	36	126	37	2317	55	3682	653	368	1021	6187
3285	2014	524	973	1497	201	76	857	37	130	39	2414	63	3817	733	408	1141	6454
4015	2016	525	984	1508	206	78	868	37	133	41	2505	69	3937	785	438	1223	6667
4745	2018	526	993	1519	209	80	878	38	136	42	2583	73	4038	824	459	1283	6840
5475	2020	527	1002	1529	212	81	886	39	139	43	2649	76	4125	854	476	1330	6984
6205	2022	528	1011	1538	215	84	996	40	150	47	2893	93	4516	905	490	1395	7450

B-1 (S3A-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3A (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	529	1021	1549	221	89	1077	42	167	51	3160	105	4912	954	502	1456	7917
7665	2026	530	1032	1562	228	95	1125	45	179	55	3361	112	5199	990	513	1503	8264
8395	2028	531	1045	1575	235	99	1157	46	187	58	3518	116	5417	1018	523	1542	8533
9125	2030	532	1057	1589	242	103	1180	48	193	60	3646	119	5590	1042	533	1575	8754
9855	2032	533	1069	1602	247	106	1199	49	198	62	3752	121	5734	1062	543	1605	8941
10585	2034	534	1081	1615	252	108	1214	49	202	64	3843	124	5856	1080	552	1632	9103
11315	2036	535	1093	1627	256	111	1227	50	205	65	3920	125	5960	1096	560	1656	9244
12045	2038	536	1104	1640	260	112	1238	51	208	67	3988	127	6051	1109	568	1677	9368
12775	2040	537	1115	1652	263	114	1249	51	211	68	4048	128	6132	1121	575	1696	9479
13505	2042	538	1125	1663	266	115	1258	52	213	69	4101	129	6203	1131	582	1713	9579
14235	2044	540	1134	1674	269	117	1266	52	215	69	4148	130	6267	1141	587	1728	9668
14965	2046	541	1143	1684	271	118	1273	52	217	70	4191	131	6324	1149	593	1741	9749
15695	2048	542	1152	1694	274	119	1280	53	219	71	4229	132	6376	1156	597	1753	9823
16425	2050	544	1160	1704	276	120	1286	53	221	72	4264	133	6423	1163	602	1764	9891
17155	2052	545	1168	1713	277	121	1291	53	222	72	4295	133	6466	1168	605	1774	9953
17885	2054	546	1176	1722	279	122	1296	54	223	73	4324	134	6505	1174	609	1782	10010
18615	2056	548	1183	1731	281	122	1301	54	225	73	4351	135	6541	1178	612	1790	10062
19345	2058	549	1190	1739	282	123	1306	54	226	74	4375	135	6574	1183	615	1798	10111
20075	2060	550	1197	1747	284	124	1310	54	227	74	4398	135	6605	1187	618	1804	10156
20805	2062	552	1203	1754	285	124	1314	54	228	74	4418	136	6634	1190	620	1810	10198
21535	2064	553	1209	1761	286	125	1317	55	229	75	4438	136	6661	1194	622	1816	10238
22265	2066	554	1214	1768	287	126	1321	55	229	75	4456	137	6685	1197	624	1821	10275
22995	2068	555	1220	1775	289	126	1324	55	230	75	4473	137	6708	1199	626	1826	10309
23725	2070	556	1225	1782	290	127	1327	55	231	76	4488	137	6730	1202	628	1830	10342
24455	2072	558	1230	1788	291	127	1329	55	232	76	4503	137	6750	1204	630	1834	10372
25185	2074	559	1235	1794	291	127	1332	55	232	76	4517	138	6769	1207	631	1838	10401
25915	2076	560	1239	1799	292	128	1335	55	233	76	4530	138	6787	1209	633	1841	10428
26645	2078	561	1244	1805	293	128	1337	56	233	77	4542	138	6804	1211	634	1845	10454
27375	2080	562	1248	1810	294	129	1339	56	234	77	4554	138	6820	1213	635	1848	10478
28105	2082	563	1252	1815	295	129	1341	56	234	77	4564	139	6835	1214	637	1851	10501
28835	2084	564	1256	1820	295	129	1343	56	235	77	4575	139	6849	1216	638	1854	10523
29565	2086	565	1260	1825	296	130	1345	56	235	78	4584	139	6863	1217	639	1856	10543
30295	2088	566	1263	1829	297	130	1347	56	236	78	4594	139	6875	1219	640	1859	10563
31025	2090	567	1267	1834	297	130	1348	56	236	78	4602	139	6887	1220	641	1861	10582
31755	2092	568	1270	1838	298	130	1350	56	237	78	4611	139	6899	1221	642	1863	10600
32485	2094	569	1273	1842	298	131	1352	56	237	78	4619	140	6910	1223	643	1865	10617
33215	2096	570	1276	1846	299	131	1353	56	237	78	4626	140	6920	1224	643	1867	10633
33945	2098	571	1279	1850	299	131	1354	56	238	78	4633	140	6930	1225	644	1869	10649
34675	2100	571	1282	1854	300	131	1356	56	238	79	4640	140	6940	1226	645	1871	10664
35405	2102	572	1285	1857	300	132	1357	57	238	79	4647	140	6949	1227	646	1872	10678
36135	2104	573	1288	1861	301	132	1358	57	239	79	4653	140	6958	1228	646	1874	10692

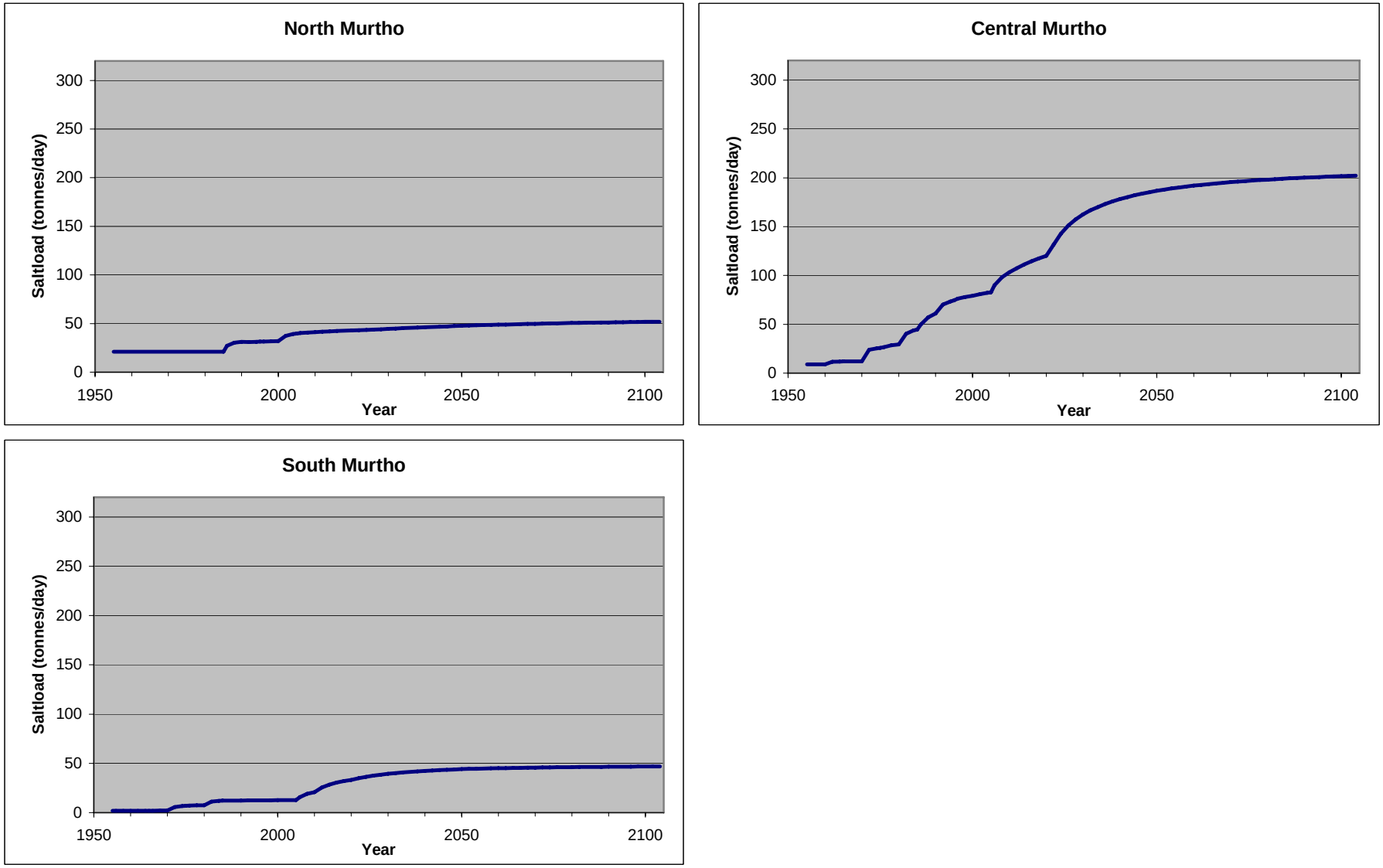
B-1 (S3A-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3A (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
30	1955	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
365	1956	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1095	1958	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1825	1960	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
2555	1962	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.2	0.0	11.7	0.2	1.9	2.0	34.7
3285	1964	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	34.9
3650	1965	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	35.0
4015	1966	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
4745	1968	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
5475	1970	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.1	0.2	1.9	2.0	35.1
6205	1972	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	20.1	0.1	23.8	3.8	2.1	5.8	50.6
6935	1974	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	21.6	0.1	25.4	4.5	2.2	6.7	53.1
7300	1975	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	22.0	0.1	25.9	4.7	2.2	6.9	53.8
7665	1976	13.3	7.7	21.0	0.6	0.4	1.7	0.8	0.3	0.1	22.6	0.1	26.6	4.9	2.2	7.1	54.7
8395	1978	13.3	7.7	21.0	0.6	0.4	1.8	0.8	0.3	0.1	24.2	0.1	28.3	5.1	2.3	7.3	56.7
9125	1980	13.3	7.7	21.0	0.6	0.4	2.0	0.9	0.3	0.1	25.1	0.1	29.5	5.2	2.3	7.5	58.0
9855	1982	13.3	7.7	21.0	0.7	0.4	6.4	0.9	0.4	0.1	30.7	0.8	40.3	8.1	3.1	11.2	72.5
10585	1984	13.3	7.7	21.0	0.7	0.5	7.0	1.0	0.4	0.2	32.9	0.9	43.6	8.6	3.4	12.0	76.6
10950	1985	13.3	7.7	21.0	0.7	0.5	7.2	1.0	0.4	0.2	33.6	0.9	44.5	8.8	3.4	12.2	77.8
11315	1986	15.2	11.9	27.1	0.8	0.6	10.3	1.0	0.5	0.2	35.5	0.9	49.7	8.9	3.2	12.1	88.9
12045	1988	15.3	15.0	30.3	0.9	0.8	13.5	1.1	0.6	0.2	39.1	0.9	57.1	9.0	3.1	12.1	99.5
12775	1990	15.4	15.8	31.2	1.1	1.0	14.7	1.2	0.7	0.2	41.2	1.0	61.0	9.1	3.1	12.2	104.4
13505	1992	15.2	15.7	31.0	3.7	1.3	18.7	1.2	0.8	0.2	43.4	1.0	70.2	9.2	3.1	12.3	113.5
14235	1994	15.2	16.0	31.2	4.1	1.4	19.4	1.3	0.8	0.2	45.1	1.0	73.4	9.3	3.1	12.4	117.0
14600	1995	15.3	16.1	31.4	4.2	1.5	19.6	1.3	0.8	0.2	45.8	1.0	74.4	9.3	3.2	12.4	118.3
14965	1996	15.3	16.2	31.5	4.3	1.5	20.7	1.3	0.8	0.2	46.3	1.0	76.3	9.3	3.2	12.5	120.2
15695	1998	15.3	16.4	31.7	4.4	1.6	21.1	1.3	0.9	0.2	47.2	1.0	77.9	9.4	3.2	12.5	122.1
16425	2000	15.3	16.6	31.9	4.5	1.7	21.4	1.3	0.9	0.2	48.0	1.0	79.1	9.4	3.2	12.6	123.6
17155	2002	15.4	21.9	37.3	4.7	1.8	22.1	1.4	0.9	0.2	48.6	1.0	80.8	9.4	3.2	12.6	130.7
17885	2004	15.5	23.8	39.3	4.9	1.9	22.5	1.4	0.9	0.3	49.3	1.0	82.2	9.5	3.2	12.7	134.2
18250	2005	15.5	24.3	39.8	5.0	1.9	22.7	1.4	0.9	0.3	49.6	1.0	82.7	9.5	3.2	12.7	135.2
365	2006	15.5	24.6	40.1	5.1	1.9	22.9	1.4	0.9	0.3	56.5	1.0	90.0	10.6	5.1	15.8	145.9
1095	2008	15.6	25.1	40.7	5.4	2.0	23.8	1.4	1.0	0.3	62.9	1.1	98.0	11.8	7.2	19.0	157.8
1825	2010	15.6	25.6	41.2	5.7	2.1	24.7	1.5	1.1	0.3	66.7	1.2	103.2	12.7	8.1	20.9	165.3
2555	2012	15.7	25.9	41.6	5.9	2.2	25.3	1.5	1.1	0.3	69.5	1.4	107.2	16.3	9.2	25.5	174.4
3285	2014	15.7	26.3	42.0	6.0	2.3	25.7	1.6	1.2	0.4	72.4	1.6	111.1	18.3	10.2	28.5	181.6
4015	2016	15.7	26.6	42.3	6.2	2.3	26.0	1.6	1.2	0.4	75.1	1.7	114.6	19.6	10.9	30.6	187.4
4745	2018	15.8	26.8	42.6	6.3	2.4	26.3	1.6	1.2	0.4	77.5	1.8	117.5	20.6	11.5	32.1	192.2
5475	2020	15.8	27.1	42.9	6.4	2.4	26.6	1.7	1.2	0.4	79.5	1.9	120.0	21.4	11.9	33.3	196.1
6205	2022	15.8	27.3	43.1	6.4	2.5	29.9	1.7	1.3	0.4	86.8	2.3	131.4	22.6	12.2	34.9	209.4
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

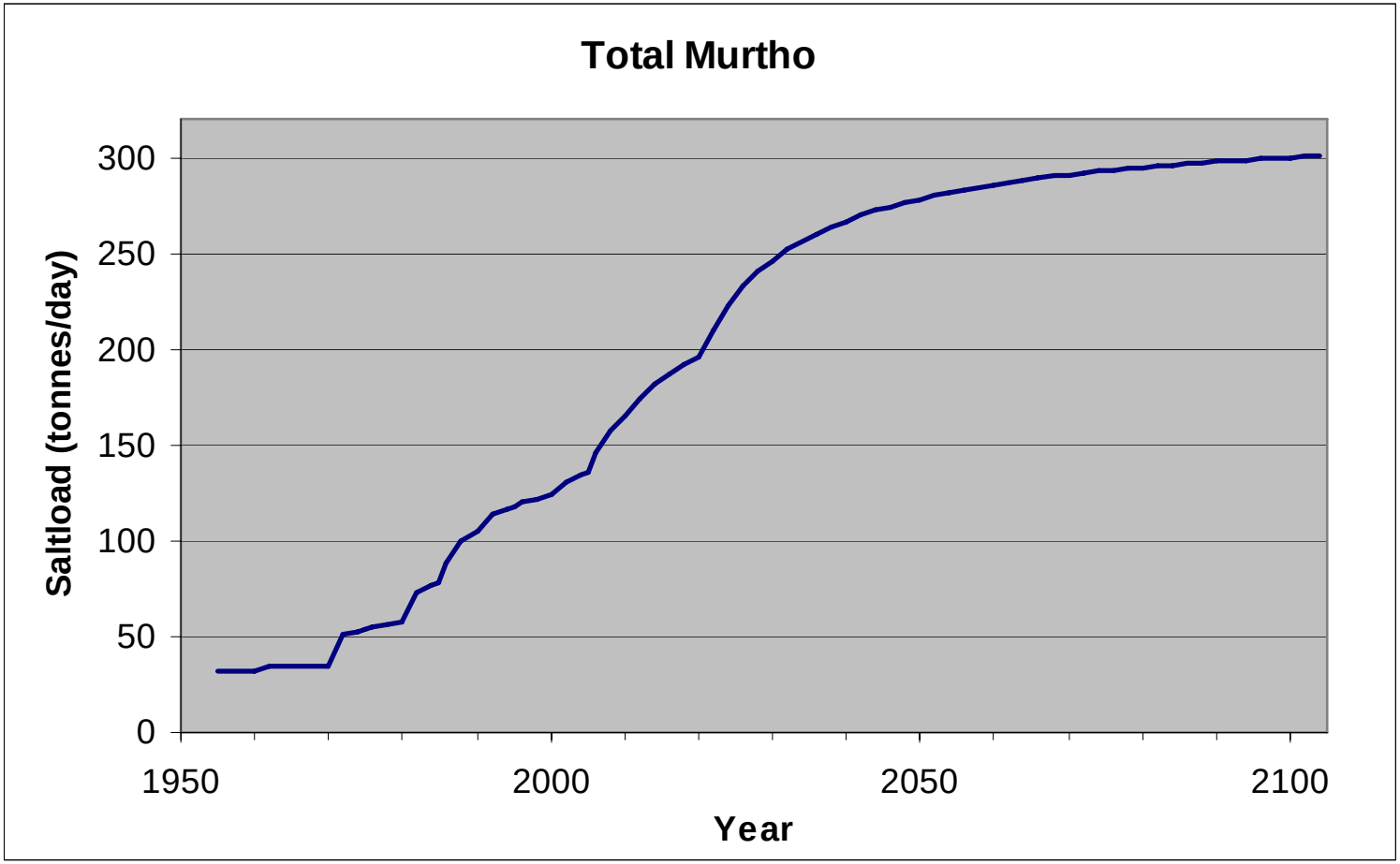
B-1 (S3A-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3A (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	15.9	27.6	43.4	6.6	2.7	32.3	1.8	1.5	0.5	94.8	2.6	142.8	23.8	12.5	36.4	222.6
7665	2026	15.9	27.9	43.8	6.8	2.8	33.8	1.9	1.6	0.5	100.8	2.8	151.1	24.7	12.8	37.6	232.4
8395	2028	15.9	28.2	44.1	7.1	3.0	34.7	2.0	1.7	0.5	105.6	2.9	157.4	25.5	13.1	38.5	240.0
9125	2030	15.9	28.5	44.5	7.3	3.1	35.4	2.0	1.7	0.5	109.4	3.0	162.4	26.1	13.3	39.4	246.3
9855	2032	16.0	28.9	44.9	7.4	3.2	36.0	2.1	1.8	0.6	112.6	3.0	166.6	26.6	13.6	40.1	251.6
10585	2034	16.0	29.2	45.2	7.6	3.3	36.4	2.1	1.8	0.6	115.3	3.1	170.1	27.0	13.8	40.8	256.1
11315	2036	16.0	29.5	45.5	7.7	3.3	36.8	2.1	1.8	0.6	117.6	3.1	173.1	27.4	14.0	41.4	260.1
12045	2038	16.1	29.8	45.9	7.8	3.4	37.2	2.2	1.9	0.6	119.6	3.2	175.8	27.7	14.2	41.9	263.6
12775	2040	16.1	30.1	46.2	7.9	3.4	37.5	2.2	1.9	0.6	121.4	3.2	178.1	28.0	14.4	42.4	266.7
13505	2042	16.2	30.4	46.5	8.0	3.5	37.7	2.2	1.9	0.6	123.0	3.2	180.2	28.3	14.5	42.8	269.5
14235	2044	16.2	30.6	46.8	8.1	3.5	38.0	2.2	1.9	0.6	124.4	3.3	182.0	28.5	14.7	43.2	272.0
14965	2046	16.2	30.9	47.1	8.1	3.5	38.2	2.3	2.0	0.6	125.7	3.3	183.7	28.7	14.8	43.5	274.3
15695	2048	16.3	31.1	47.4	8.2	3.6	38.4	2.3	2.0	0.6	126.9	3.3	185.2	28.9	14.9	43.8	276.4
16425	2050	16.3	31.3	47.6	8.3	3.6	38.6	2.3	2.0	0.6	127.9	3.3	186.6	29.1	15.0	44.1	278.3
17155	2052	16.4	31.5	47.9	8.3	3.6	38.7	2.3	2.0	0.6	128.9	3.3	187.8	29.2	15.1	44.3	280.1
17885	2054	16.4	31.7	48.1	8.4	3.7	38.9	2.3	2.0	0.7	129.7	3.4	189.0	29.3	15.2	44.6	281.7
18615	2056	16.4	31.9	48.4	8.4	3.7	39.0	2.3	2.0	0.7	130.5	3.4	190.0	29.5	15.3	44.8	283.1
19345	2058	16.5	32.1	48.6	8.5	3.7	39.2	2.3	2.0	0.7	131.2	3.4	191.0	29.6	15.4	44.9	284.5
20075	2060	16.5	32.3	48.8	8.5	3.7	39.3	2.3	2.0	0.7	131.9	3.4	191.9	29.7	15.4	45.1	285.8
20805	2062	16.5	32.5	49.0	8.6	3.7	39.4	2.3	2.0	0.7	132.5	3.4	192.7	29.8	15.5	45.3	287.0
21535	2064	16.6	32.6	49.2	8.6	3.8	39.5	2.3	2.1	0.7	133.1	3.4	193.5	29.8	15.6	45.4	288.1
22265	2066	16.6	32.8	49.4	8.6	3.8	39.6	2.4	2.1	0.7	133.7	3.4	194.2	29.9	15.6	45.5	289.1
22995	2068	16.7	32.9	49.6	8.7	3.8	39.7	2.4	2.1	0.7	134.2	3.4	194.9	30.0	15.7	45.6	290.1
23725	2070	16.7	33.1	49.8	8.7	3.8	39.8	2.4	2.1	0.7	134.6	3.4	195.5	30.1	15.7	45.8	291.0
24455	2072	16.7	33.2	49.9	8.7	3.8	39.9	2.4	2.1	0.7	135.1	3.4	196.1	30.1	15.7	45.9	291.9
25185	2074	16.8	33.3	50.1	8.7	3.8	40.0	2.4	2.1	0.7	135.5	3.4	196.6	30.2	15.8	45.9	292.7
25915	2076	16.8	33.5	50.3	8.8	3.8	40.0	2.4	2.1	0.7	135.9	3.4	197.1	30.2	15.8	46.0	293.4
26645	2078	16.8	33.6	50.4	8.8	3.8	40.1	2.4	2.1	0.7	136.3	3.5	197.6	30.3	15.9	46.1	294.2
27375	2080	16.9	33.7	50.6	8.8	3.9	40.2	2.4	2.1	0.7	136.6	3.5	198.1	30.3	15.9	46.2	294.9
28105	2082	16.9	33.8	50.7	8.8	3.9	40.2	2.4	2.1	0.7	136.9	3.5	198.5	30.4	15.9	46.3	295.5
28835	2084	16.9	33.9	50.8	8.9	3.9	40.3	2.4	2.1	0.7	137.2	3.5	198.9	30.4	15.9	46.3	296.1
29565	2086	17.0	34.0	51.0	8.9	3.9	40.3	2.4	2.1	0.7	137.5	3.5	199.3	30.4	16.0	46.4	296.7
30295	2088	17.0	34.1	51.1	8.9	3.9	40.4	2.4	2.1	0.7	137.8	3.5	199.7	30.5	16.0	46.5	297.3
31025	2090	17.0	34.2	51.2	8.9	3.9	40.5	2.4	2.1	0.7	138.1	3.5	200.1	30.5	16.0	46.5	297.8
31755	2092	17.0	34.3	51.3	8.9	3.9	40.5	2.4	2.1	0.7	138.3	3.5	200.4	30.5	16.0	46.6	298.3
32485	2094	17.1	34.4	51.4	8.9	3.9	40.5	2.4	2.1	0.7	138.6	3.5	200.7	30.6	16.1	46.6	298.8
33215	2096	17.1	34.5	51.6	9.0	3.9	40.6	2.4	2.1	0.7	138.8	3.5	201.0	30.6	16.1	46.7	299.2
33945	2098	17.1	34.5	51.7	9.0	3.9	40.6	2.4	2.1	0.7	139.0	3.5	201.3	30.6	16.1	46.7	299.7
34675	2100	17.1	34.6	51.8	9.0	3.9	40.7	2.4	2.1	0.7	139.2	3.5	201.6	30.6	16.1	46.8	300.1
35405	2102	17.2	34.7	51.9	9.0	3.9	40.7	2.4	2.1	0.7	139.4	3.5	201.8	30.7	16.1	46.8	300.5
36135	2104	17.2	34.8	52.0	9.0	4.0	40.7	2.4	2.1	0.7	139.6	3.5	202.1	30.7	16.2	46.8	300.9
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

B-1 (S3A-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3A (Murtho Area)



B-1 (S3A-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-3A (Murtho Area)



B-1 (S3A-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-3A (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
30	1955	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
365	1956	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
1095	1958	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
1825	1960	444	283	727	21	12	49	19	17	5	183	2	307	6	75	81	1116
2555	1962	444	283	727	21	12	49	19	18	6	273	2	398	6	75	81	1207
3285	1964	444	283	727	21	12	49	19	18	6	279	2	405	6	75	81	1214
3650	1965	444	283	727	21	12	49	19	18	6	281	2	407	6	75	81	1216
4015	1966	444	283	727	21	12	49	19	18	6	282	2	408	6	75	81	1217
4745	1968	444	283	727	21	12	49	19	18	6	283	2	410	6	75	81	1219
5475	1970	444	283	727	21	12	49	19	18	6	284	2	411	6	75	81	1220
6205	1972	444	284	727	21	12	50	19	24	11	670	2	810	151	83	233	1771
6935	1974	444	284	728	21	12	53	19	27	12	720	3	867	181	88	268	1863
7300	1975	444	284	728	21	12	54	19	27	12	733	3	883	188	89	277	1888
7665	1976	444	284	728	21	12	56	19	28	13	754	3	906	194	90	284	1918
8395	1978	444	284	728	21	13	62	20	31	14	805	4	968	202	92	294	1989
9125	1980	444	284	728	21	13	67	20	32	14	837	4	1009	207	93	300	2037
9855	1982	444	285	729	22	14	212	21	41	16	1023	30	1380	323	124	448	2556
10585	1984	444	286	730	24	16	235	22	47	18	1097	35	1494	345	135	480	2703
10950	1985	444	286	730	24	17	241	23	49	18	1119	36	1527	350	138	488	2745
11315	1986	505	441	946	25	19	344	23	54	19	1183	37	1703	355	129	484	3133
12045	1988	510	555	1066	30	26	450	25	68	21	1302	38	1961	361	125	485	3512
12775	1990	513	585	1098	37	33	489	27	76	23	1373	38	2095	365	125	489	3683
13505	1992	508	583	1091	123	42	624	29	85	24	1445	39	2410	368	125	493	3993
14235	1994	508	592	1101	137	48	647	30	90	25	1504	39	2520	370	126	496	4117
14600	1995	509	597	1105	141	50	654	30	92	26	1525	39	2557	371	126	498	4160
14965	1996	509	601	1110	144	52	691	31	93	26	1543	40	2619	372	127	499	4227
15695	1998	509	608	1118	148	54	705	31	95	26	1575	40	2675	374	127	502	4294
16425	2000	510	615	1125	152	56	713	31	97	27	1599	40	2715	376	128	504	4344
17155	2002	483	708	1192	158	59	723	32	97	26	1523	27	2645	262	112	374	4210
17885	2004	485	754	1239	162	57	417	30	80	24	1364	25	2158	242	97	339	3736
18250	2005	486	765	1251	162	54	374	28	72	23	1302	25	2040	237	94	331	3622
365	2006	487	773	1260	163	52	372	27	68	23	1479	24	2210	278	158	435	3905
1095	2008	486	777	1263	170	52	388	27	70	23	1444	27	2201	317	233	550	4014
1825	2010	484	764	1248	175	55	403	27	73	24	1501	30	2287	350	265	616	4151
2555	2012	483	743	1226	176	57	412	28	75	25	1545	34	2351	432	294	726	4303
3285	2014	481	720	1200	176	58	417	28	77	26	1587	39	2409	479	318	797	4406
4015	2016	478	694	1172	175	59	420	29	78	27	1625	42	2455	510	336	846	4474
4745	2018	476	667	1143	173	60	422	29	79	27	1656	45	2491	534	348	882	4516
5475	2020	474	641	1116	171	60	423	29	80	28	1679	46	2518	552	359	910	4544
6205	2022	474	621	1095	170	62	523	30	89	30	1862	55	2821	578	367	946	4862

B-1 (S3B-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3B (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	474	604	1078	170	66	598	32	104	34	2067	61	3133	604	374	979	5189
7665	2026	473	588	1062	173	71	639	34	115	37	2213	65	3346	623	380	1003	5411
8395	2028	473	573	1047	176	75	664	35	121	39	2317	67	3494	624	384	1008	5548
9125	2030	473	574	1047	178	77	680	36	125	41	2396	69	3602	633	388	1022	5671
9855	2032	473	579	1052	179	80	692	37	128	41	2380	69	3607	608	320	927	5586
10585	2034	474	585	1059	180	81	700	38	131	42	2411	69	3651	595	295	890	5599
11315	2036	474	592	1066	180	83	706	38	132	43	2437	68	3686	587	286	873	5625
12045	2038	475	598	1073	179	84	710	38	134	43	2458	68	3714	583	282	865	5652
12775	2040	475	605	1080	178	85	713	38	135	44	2476	68	3736	582	281	862	5678
13505	2042	476	609	1085	173	83	629	38	128	42	2334	68	3496	581	280	862	5442
14235	2044	477	610	1087	166	80	579	37	118	40	2214	68	3300	582	281	863	5250
14965	2046	478	610	1088	158	76	551	36	112	38	2142	68	3180	583	281	864	5132
15695	2048	479	609	1088	153	72	516	35	108	37	2098	68	3088	584	282	866	5042
16425	2050	479	608	1087	148	68	498	34	105	37	2067	68	3026	585	283	868	4981
17155	2052	480	606	1086	144	66	487	34	103	36	2045	68	2984	586	284	870	4939
17885	2054	481	604	1085	141	64	480	34	102	36	2030	68	2956	587	284	872	4912
18615	2056	481	602	1084	139	63	475	33	101	36	2019	68	2936	588	285	873	4893
19345	2058	482	601	1083	138	62	472	33	101	36	2012	68	2923	589	286	875	4880
20075	2060	483	600	1082	137	62	470	33	100	35	2007	68	2913	590	286	876	4872
20805	2062	483	599	1082	136	61	468	33	100	35	2004	69	2906	591	287	878	4866
21535	2064	483	598	1081	135	61	467	33	100	35	2002	69	2902	591	288	879	4863
22265	2066	484	598	1081	135	61	466	33	100	35	2001	69	2899	592	288	880	4861
22995	2068	484	597	1081	135	61	465	33	99	35	2000	69	2898	593	289	881	4860
23725	2070	484	597	1082	134	61	465	33	99	35	2000	69	2897	593	289	882	4861
24455	2072	485	597	1082	134	61	465	33	99	35	2001	69	2897	594	289	883	4862
25185	2074	485	597	1082	134	61	464	33	99	35	2002	69	2897	594	290	884	4863
25915	2076	485	597	1083	134	60	464	33	99	35	2003	69	2898	595	290	885	4866
26645	2078	486	598	1083	134	60	464	33	99	35	2004	69	2899	595	291	886	4868
27375	2080	486	598	1084	134	60	464	33	99	35	2005	69	2901	596	291	887	4871
28105	2082	486	598	1084	134	60	464	33	100	35	2006	69	2902	596	291	887	4874
28835	2084	486	599	1085	134	60	465	33	100	36	2008	69	2904	596	292	888	4877
29565	2086	486	599	1086	134	61	465	33	100	36	2009	69	2906	597	292	889	4880
30295	2088	487	600	1086	134	61	465	33	100	36	2011	69	2908	597	292	889	4883
31025	2090	487	600	1087	134	61	465	33	100	36	2012	69	2910	598	292	890	4886
31755	2092	487	600	1088	134	61	465	33	100	36	2014	69	2912	598	293	890	4890
32485	2094	487	601	1088	134	61	466	33	100	36	2015	69	2914	598	293	891	4893
33215	2096	488	602	1089	134	61	466	33	100	36	2017	69	2916	599	293	892	4896
33945	2098	488	602	1090	134	61	466	33	100	36	2018	69	2918	599	293	892	4899
34675	2100	488	603	1091	134	61	466	33	100	36	2020	69	2920	599	293	893	4903
35405	2102	488	603	1091	134	61	467	33	100	36	2021	69	2922	599	294	893	4906
36135	2104	488	604	1092	134	61	467	33	100	36	2023	69	2924	600	294	893	4909

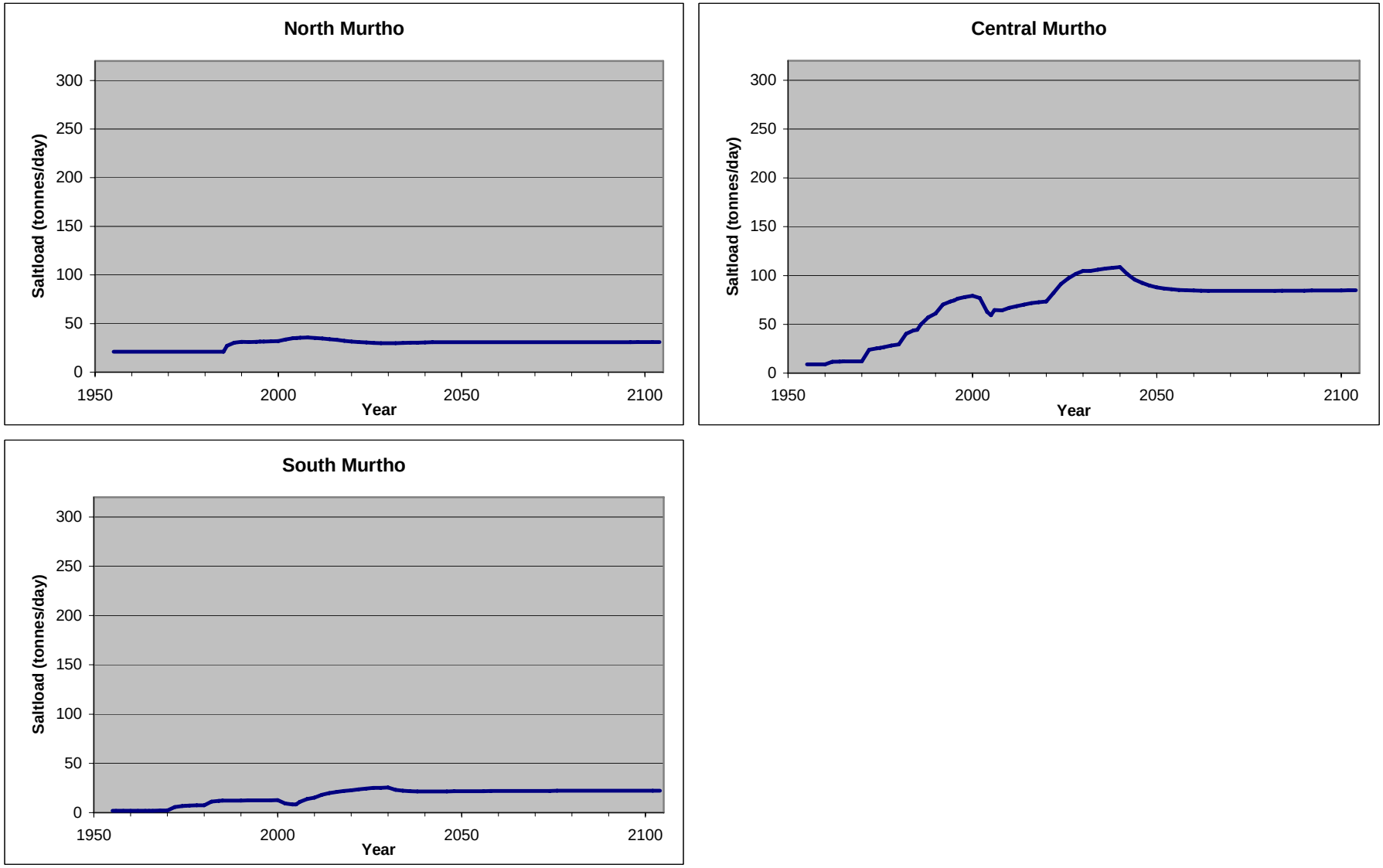
B-1 (S3B-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3B (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
30	1955	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
365	1956	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1095	1958	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1825	1960	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
2555	1962	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.2	0.0	11.7	0.2	1.9	2.0	34.7
3285	1964	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	34.9
3650	1965	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	35.0
4015	1966	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
4745	1968	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
5475	1970	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.1	0.2	1.9	2.0	35.1
6205	1972	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	20.1	0.1	23.8	3.8	2.1	5.8	50.6
6935	1974	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	21.6	0.1	25.4	4.5	2.2	6.7	53.1
7300	1975	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	22.0	0.1	25.9	4.7	2.2	6.9	53.8
7665	1976	13.3	7.7	21.0	0.6	0.4	1.7	0.8	0.3	0.1	22.6	0.1	26.6	4.9	2.2	7.1	54.7
8395	1978	13.3	7.7	21.0	0.6	0.4	1.8	0.8	0.3	0.1	24.2	0.1	28.3	5.1	2.3	7.3	56.7
9125	1980	13.3	7.7	21.0	0.6	0.4	2.0	0.9	0.3	0.1	25.1	0.1	29.5	5.2	2.3	7.5	58.0
9855	1982	13.3	7.7	21.0	0.7	0.4	6.4	0.9	0.4	0.1	30.7	0.8	40.3	8.1	3.1	11.2	72.5
10585	1984	13.3	7.7	21.0	0.7	0.5	7.0	1.0	0.4	0.2	32.9	0.9	43.6	8.6	3.4	12.0	76.6
10950	1985	13.3	7.7	21.0	0.7	0.5	7.2	1.0	0.4	0.2	33.6	0.9	44.5	8.8	3.4	12.2	77.8
11315	1986	15.2	11.9	27.1	0.8	0.6	10.3	1.0	0.5	0.2	35.5	0.9	49.7	8.9	3.2	12.1	88.9
12045	1988	15.3	15.0	30.3	0.9	0.8	13.5	1.1	0.6	0.2	39.1	0.9	57.1	9.0	3.1	12.1	99.5
12775	1990	15.4	15.8	31.2	1.1	1.0	14.7	1.2	0.7	0.2	41.2	1.0	61.0	9.1	3.1	12.2	104.4
13505	1992	15.2	15.7	31.0	3.7	1.3	18.7	1.2	0.8	0.2	43.4	1.0	70.2	9.2	3.1	12.3	113.5
14235	1994	15.2	16.0	31.2	4.1	1.4	19.4	1.3	0.8	0.2	45.1	1.0	73.4	9.3	3.1	12.4	117.0
14600	1995	15.3	16.1	31.4	4.2	1.5	19.6	1.3	0.8	0.2	45.8	1.0	74.4	9.3	3.2	12.4	118.3
14965	1996	15.3	16.2	31.5	4.3	1.5	20.7	1.3	0.8	0.2	46.3	1.0	76.3	9.3	3.2	12.5	120.2
15695	1998	15.3	16.4	31.7	4.4	1.6	21.1	1.3	0.9	0.2	47.2	1.0	77.9	9.4	3.2	12.5	122.1
16425	2000	15.3	16.6	31.9	4.5	1.7	21.4	1.3	0.9	0.2	48.0	1.0	79.1	9.4	3.2	12.6	123.5
17155	2002	14.5	19.1	33.6	4.7	1.8	21.7	1.4	0.9	0.2	45.7	0.7	77.0	6.6	2.8	9.4	120.0
17885	2004	14.6	20.4	34.9	4.9	1.7	12.5	1.3	0.7	0.2	40.9	0.6	62.8	6.1	2.4	8.5	106.2
18250	2005	14.6	20.7	35.2	4.8	1.6	11.2	1.2	0.6	0.2	39.1	0.6	59.5	5.9	2.4	8.3	103.0
365	2006	14.6	20.9	35.5	4.9	1.6	11.2	1.2	0.6	0.2	44.4	0.6	64.6	6.9	3.9	10.9	111.0
1095	2008	14.6	21.0	35.6	5.1	1.6	11.6	1.1	0.6	0.2	43.3	0.7	64.3	7.9	5.8	13.8	113.6
1825	2010	14.5	20.6	35.2	5.2	1.6	12.1	1.2	0.7	0.2	45.0	0.7	66.8	8.8	6.6	15.4	117.3
2555	2012	14.5	20.1	34.5	5.3	1.7	12.4	1.2	0.7	0.2	46.3	0.9	68.6	10.8	7.3	18.2	121.3
3285	2014	14.4	19.4	33.8	5.3	1.7	12.5	1.2	0.7	0.2	47.6	1.0	70.3	12.0	8.0	19.9	124.0
4015	2016	14.4	18.7	33.1	5.2	1.8	12.6	1.2	0.7	0.2	48.8	1.1	71.6	12.8	8.4	21.1	125.8
4745	2018	14.3	18.0	32.3	5.2	1.8	12.7	1.2	0.7	0.2	49.7	1.1	72.6	13.3	8.7	22.0	127.0
5475	2020	14.2	17.3	31.5	5.1	1.8	12.7	1.2	0.7	0.3	50.4	1.2	73.4	13.8	9.0	22.8	127.7
6205	2022	14.2	16.8	31.0	5.1	1.9	15.7	1.3	0.8	0.3	55.9	1.4	82.2	14.5	9.2	23.6	136.9
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

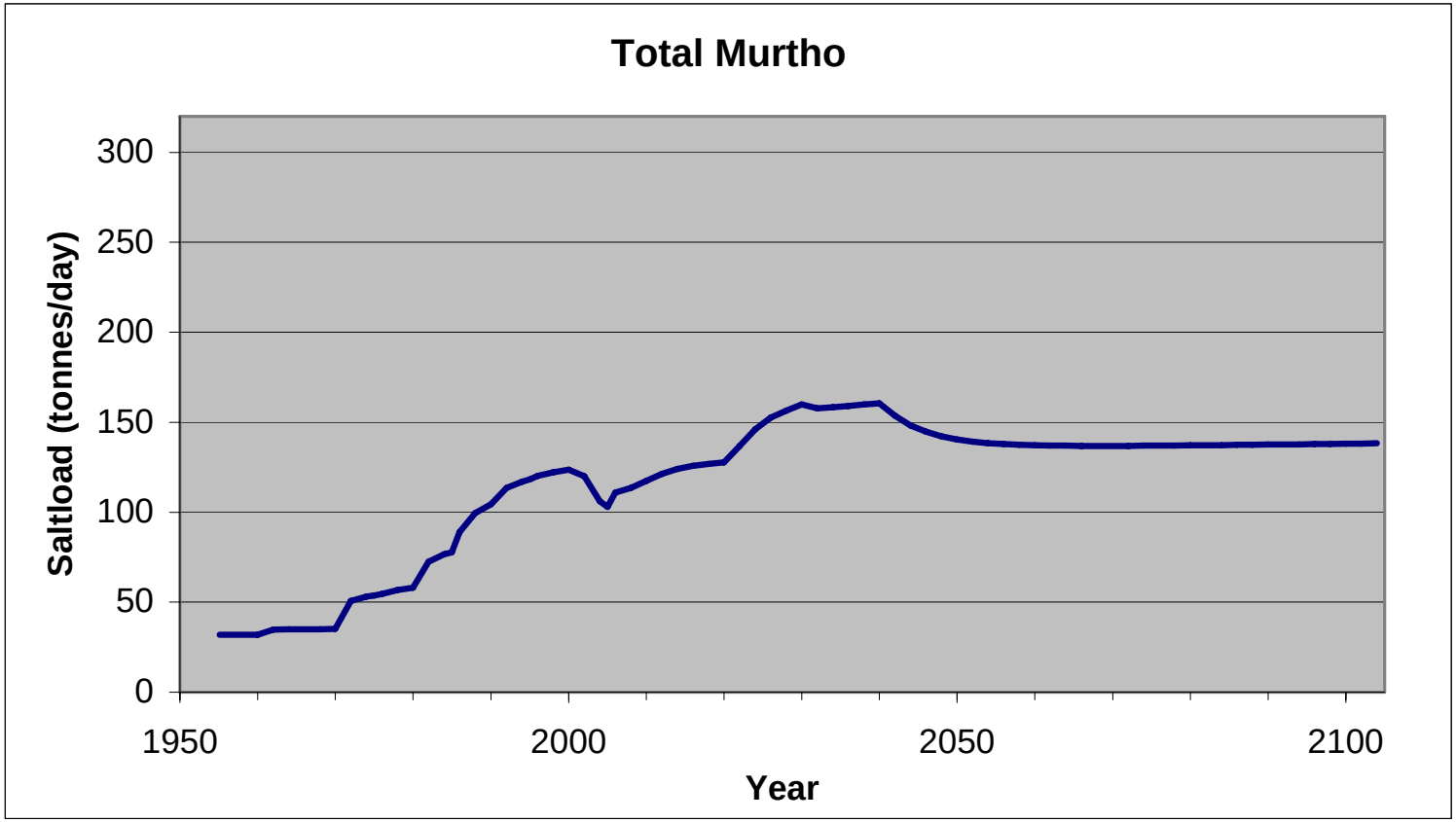
B-1 (S3B-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3B (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	14.2	16.3	30.5	5.1	2.0	17.9	1.4	0.9	0.3	62.0	1.5	91.2	15.1	9.4	24.5	146.2
7665	2026	14.2	15.9	30.1	5.2	2.1	19.2	1.5	1.0	0.3	66.4	1.6	97.3	15.6	9.5	25.1	152.5
8395	2028	14.2	15.5	29.7	5.3	2.2	19.9	1.5	1.1	0.4	69.5	1.7	101.6	15.6	9.6	25.2	156.5
9125	2030	14.2	15.5	29.7	5.3	2.3	20.4	1.6	1.1	0.4	71.9	1.7	104.7	15.8	9.7	25.5	159.9
9855	2032	14.2	15.6	29.8	5.4	2.4	20.8	1.6	1.2	0.4	71.4	1.7	104.8	15.2	8.0	23.2	157.8
10585	2034	14.2	15.8	30.0	5.4	2.4	21.0	1.6	1.2	0.4	72.3	1.7	106.0	14.9	7.4	22.2	158.3
11315	2036	14.2	16.0	30.2	5.4	2.5	21.2	1.6	1.2	0.4	73.1	1.7	107.1	14.7	7.1	21.8	159.1
12045	2038	14.2	16.2	30.4	5.4	2.5	21.3	1.6	1.2	0.4	73.7	1.7	107.9	14.6	7.0	21.6	159.9
12775	2040	14.3	16.3	30.6	5.4	2.5	21.4	1.6	1.2	0.4	74.3	1.7	108.5	14.5	7.0	21.6	160.6
13505	2042	14.3	16.4	30.7	5.2	2.5	18.9	1.6	1.2	0.4	70.0	1.7	101.5	14.5	7.0	21.5	153.7
14235	2044	14.3	16.5	30.8	5.0	2.4	17.4	1.6	1.1	0.4	66.4	1.7	95.8	14.6	7.0	21.6	148.2
14965	2046	14.3	16.5	30.8	4.7	2.3	16.5	1.5	1.0	0.3	64.3	1.7	92.4	14.6	7.0	21.6	144.8
15695	2048	14.4	16.4	30.8	4.6	2.2	15.5	1.5	1.0	0.3	62.9	1.7	89.7	14.6	7.0	21.7	142.2
16425	2050	14.4	16.4	30.8	4.5	2.1	14.9	1.5	0.9	0.3	62.0	1.7	87.9	14.6	7.1	21.7	140.4
17155	2052	14.4	16.4	30.8	4.3	2.0	14.6	1.5	0.9	0.3	61.3	1.7	86.7	14.7	7.1	21.7	139.2
17885	2054	14.4	16.3	30.7	4.2	1.9	14.4	1.4	0.9	0.3	60.9	1.7	85.9	14.7	7.1	21.8	138.4
18615	2056	14.4	16.3	30.7	4.2	1.9	14.3	1.4	0.9	0.3	60.6	1.7	85.3	14.7	7.1	21.8	137.8
19345	2058	14.5	16.2	30.7	4.1	1.9	14.2	1.4	0.9	0.3	60.4	1.7	84.9	14.7	7.1	21.9	137.5
20075	2060	14.5	16.2	30.7	4.1	1.9	14.1	1.4	0.9	0.3	60.2	1.7	84.6	14.8	7.2	21.9	137.2
20805	2062	14.5	16.2	30.7	4.1	1.8	14.0	1.4	0.9	0.3	60.1	1.7	84.4	14.8	7.2	21.9	137.0
21535	2064	14.5	16.1	30.6	4.1	1.8	14.0	1.4	0.9	0.3	60.1	1.7	84.3	14.8	7.2	22.0	136.9
22265	2066	14.5	16.1	30.6	4.0	1.8	14.0	1.4	0.9	0.3	60.0	1.7	84.2	14.8	7.2	22.0	136.9
22995	2068	14.5	16.1	30.7	4.0	1.8	14.0	1.4	0.9	0.3	60.0	1.7	84.2	14.8	7.2	22.0	136.9
23725	2070	14.5	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.0	1.7	84.2	14.8	7.2	22.1	136.9
24455	2072	14.5	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.0	1.7	84.2	14.8	7.2	22.1	136.9
25185	2074	14.5	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.0	1.7	84.2	14.9	7.2	22.1	136.9
25915	2076	14.6	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.1	1.7	84.2	14.9	7.3	22.1	137.0
26645	2078	14.6	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.1	1.7	84.2	14.9	7.3	22.1	137.1
27375	2080	14.6	16.1	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.1	1.7	84.3	14.9	7.3	22.2	137.1
28105	2082	14.6	16.2	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.2	1.7	84.3	14.9	7.3	22.2	137.2
28835	2084	14.6	16.2	30.7	4.0	1.8	13.9	1.4	0.9	0.3	60.2	1.7	84.4	14.9	7.3	22.2	137.3
29565	2086	14.6	16.2	30.8	4.0	1.8	13.9	1.4	0.9	0.3	60.3	1.7	84.4	14.9	7.3	22.2	137.4
30295	2088	14.6	16.2	30.8	4.0	1.8	13.9	1.4	0.9	0.3	60.3	1.7	84.5	14.9	7.3	22.2	137.5
31025	2090	14.6	16.2	30.8	4.0	1.8	14.0	1.4	0.9	0.3	60.4	1.7	84.5	14.9	7.3	22.2	137.6
31755	2092	14.6	16.2	30.8	4.0	1.8	14.0	1.4	0.9	0.3	60.4	1.7	84.6	14.9	7.3	22.3	137.7
32485	2094	14.6	16.2	30.8	4.0	1.8	14.0	1.4	0.9	0.3	60.5	1.7	84.7	15.0	7.3	22.3	137.8
33215	2096	14.6	16.2	30.9	4.0	1.8	14.0	1.4	0.9	0.3	60.5	1.7	84.7	15.0	7.3	22.3	137.9
33945	2098	14.6	16.3	30.9	4.0	1.8	14.0	1.4	0.9	0.3	60.5	1.7	84.8	15.0	7.3	22.3	138.0
34675	2100	14.6	16.3	30.9	4.0	1.8	14.0	1.4	0.9	0.3	60.6	1.7	84.8	15.0	7.3	22.3	138.0
35405	2102	14.6	16.3	30.9	4.0	1.8	14.0	1.4	0.9	0.3	60.6	1.7	84.9	15.0	7.3	22.3	138.1
36135	2104	14.7	16.3	31.0	4.0	1.8	14.0	1.4	0.9	0.3	60.7	1.7	84.9	15.0	7.3	22.3	138.2
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

B-1 (S3B-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3B (Murtho Area)



B-1 (S3B-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-3B (Murtho Area)



B-1 (S3B-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-3B (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
30	**1955**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
365	**1956**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1095	**1958**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1825	**1960**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
2555	**1962**	444	283	***727***	21	12	49	19	18	6	273	2	***398***	6	75	***81***	***1207***
3285	**1964**	444	283	***727***	21	12	49	19	18	6	279	2	***405***	6	75	***81***	***1214***
3650	**1965**	444	283	***727***	21	12	49	19	18	6	281	2	***407***	6	75	***81***	***1216***
4015	**1966**	444	283	***727***	21	12	49	19	18	6	282	2	***408***	6	75	***81***	***1217***
4745	**1968**	444	283	***727***	21	12	49	19	18	6	283	2	***410***	6	75	***81***	***1219***
5475	**1970**	444	283	***727***	21	12	49	19	18	6	284	2	***411***	6	75	***81***	***1220***
6205	**1972**	444	284	***727***	21	12	50	19	24	11	670	2	***810***	151	83	***233***	***1771***
6935	**1974**	444	284	***728***	21	12	53	19	27	12	720	3	***867***	181	88	***268***	***1863***
7300	**1975**	444	284	***728***	21	12	54	19	27	12	733	3	***883***	188	89	***277***	***1888***
7665	**1976**	444	284	***728***	21	12	56	19	28	13	754	3	***906***	194	90	***284***	***1918***
8395	**1978**	444	284	***728***	21	13	62	20	31	14	805	4	***968***	202	92	***294***	***1989***
9125	**1980**	444	284	***728***	21	13	67	20	32	14	837	4	***1009***	207	93	***300***	***2037***
9855	**1982**	444	285	***729***	22	14	212	21	41	16	1023	30	***1380***	323	124	***448***	***2556***
10585	**1984**	444	286	***730***	24	16	235	22	47	18	1097	35	***1494***	345	135	***480***	***2703***
10950	**1985**	444	286	***730***	24	17	241	23	49	18	1119	36	***1527***	350	138	***488***	***2745***
11315	**1986**	505	441	***946***	25	19	344	23	54	19	1183	37	***1703***	355	129	***484***	***3133***
12045	**1988**	510	555	***1066***	30	26	450	25	68	21	1302	38	***1961***	361	125	***485***	***3512***
12775	**1990**	513	585	***1098***	37	33	489	27	76	23	1373	38	***2095***	365	125	***489***	***3683***
13505	**1992**	508	583	***1091***	123	42	624	29	85	24	1445	39	***2410***	368	125	***493***	***3993***
14235	**1994**	508	592	***1101***	137	48	647	30	90	25	1504	39	***2520***	370	126	***496***	***4117***
14600	**1995**	509	597	***1105***	141	50	654	30	92	26	1525	39	***2557***	371	126	***498***	***4160***
14965	**1996**	509	601	***1110***	144	52	691	31	93	26	1543	40	***2619***	372	127	***499***	***4227***
15695	**1998**	509	608	***1118***	148	54	705	31	95	26	1575	40	***2675***	374	127	***502***	***4294***
16425	**2000**	510	615	***1125***	152	56	713	31	97	27	1599	40	***2715***	376	128	***504***	***4344***
17155	**2002**	483	708	***1192***	158	59	723	32	97	26	1523	27	***2645***	262	112	***374***	***4210***
17885	**2004**	485	754	***1239***	162	57	417	30	80	24	1364	25	***2158***	242	97	***339***	***3736***
18250	**2005**	486	765	***1251***	162	54	374	28	72	23	1302	25	***2040***	237	94	***331***	***3622***
365	**2006**	487	773	***1260***	163	52	372	27	68	23	1479	24	***2210***	278	158	***435***	***3905***
1095	**2008**	486	777	***1263***	170	52	388	27	70	23	1444	27	***2201***	317	233	***550***	***4014***
1825	**2010**	484	800	***1284***	179	55	403	27	73	24	1501	30	***2291***	350	265	***616***	***4192***
2555	**2012**	483	801	***1284***	183	57	412	28	75	25	1545	34	***2358***	432	294	***726***	***4369***
3285	**2014**	481	787	***1269***	184	58	417	28	77	26	1588	39	***2417***	479	318	***797***	***4483***
4015	**2016**	479	766	***1246***	183	59	421	29	78	27	1625	42	***2465***	510	336	***846***	***4556***
4745	**2018**	477	724	***1201***	180	60	423	29	79	27	1656	45	***2499***	534	348	***882***	***4582***
5475	**2020**	476	689	***1165***	177	61	424	29	80	28	1680	46	***2525***	552	359	***910***	***4600***
6205	**2022**	475	691	***1166***	175	62	524	30	89	30	1863	55	***2829***	578	367	***946***	***4940***

B-1 (S4-1). Modelled groundwater flux (m3/day) from flow budget zones in Scenario-4 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	475	683	1158	176	67	599	32	104	34	2068	61	3141	604	374	979	5278
7665	2026	475	672	1147	179	71	640	34	115	37	2214	65	3355	623	380	1003	5504
8395	2028	475	659	1134	182	75	665	36	121	39	2319	67	3503	624	384	1008	5645
9125	2030	475	661	1135	184	78	682	36	126	41	2397	69	3612	633	388	1022	5769
9855	2032	475	667	1142	185	80	693	37	129	42	2382	69	3617	608	320	928	5687
10585	2034	475	674	1149	186	82	702	38	131	42	2413	69	3662	595	295	890	5701
11315	2036	476	707	1183	186	83	708	38	133	43	2440	68	3698	587	286	873	5754
12045	2038	477	726	1202	187	85	787	39	140	44	2511	68	3860	583	282	866	5927
12775	2040	477	739	1216	188	87	813	40	145	45	2571	68	3958	582	281	863	6037
13505	2042	478	749	1228	187	88	743	40	142	44	2504	69	3817	612	351	963	6007
14235	2044	479	756	1236	182	86	703	40	135	43	2464	70	3723	649	408	1057	6015
14965	2046	481	762	1243	177	84	683	39	131	43	2452	72	3681	678	444	1122	6045
15695	2048	485	773	1258	178	81	657	39	129	43	2468	73	3670	700	467	1168	6095
16425	2050	489	793	1283	183	80	654	39	129	44	2510	75	3713	718	483	1201	6197
17155	2052	494	815	1309	190	81	661	39	131	45	2564	76	3786	732	495	1227	6323
17885	2054	498	836	1334	195	83	670	39	133	46	2616	77	3859	744	503	1247	6441
18615	2056	502	856	1359	208	88	682	40	135	47	2664	78	3941	754	510	1264	6564
19345	2058	506	877	1382	218	94	697	40	138	48	2716	79	4029	762	516	1278	6689
20075	2060	509	896	1405	225	97	712	41	141	49	2771	79	4115	769	521	1290	6810
20805	2062	512	914	1427	231	100	727	41	144	50	2823	80	4196	776	525	1300	6923
21535	2064	515	932	1448	236	103	740	42	147	50	2871	81	4269	781	528	1309	7026
22265	2066	518	950	1468	241	105	751	42	149	51	2917	81	4338	786	531	1317	7123
22995	2068	521	966	1488	245	107	763	43	151	52	2963	82	4406	791	534	1325	7219
23725	2070	524	983	1507	249	109	775	43	154	53	3010	83	4476	795	537	1331	7314
24455	2072	527	1000	1527	254	111	787	44	156	54	3056	83	4544	799	539	1338	7409
25185	2074	530	1017	1546	258	112	799	44	159	55	3101	84	4611	802	541	1343	7501
25915	2076	533	1033	1565	262	114	809	45	161	55	3144	84	4674	806	543	1349	7588
26645	2078	535	1048	1584	265	116	819	45	163	56	3183	84	4732	809	545	1354	7670
27375	2080	538	1063	1601	269	117	828	45	165	57	3220	85	4786	812	547	1359	7746
28105	2082	541	1077	1618	272	119	836	46	167	57	3254	85	4835	815	548	1363	7817
28835	2084	544	1091	1634	274	120	843	46	168	58	3285	86	4881	818	550	1368	7883
29565	2086	546	1103	1650	277	121	850	46	170	59	3313	86	4922	820	551	1372	7944
30295	2088	549	1115	1664	279	122	856	47	171	59	3340	86	4960	823	553	1376	8000
31025	2090	551	1126	1677	281	123	862	47	172	60	3364	87	4996	825	554	1380	8053
31755	2092	554	1137	1690	283	124	867	47	174	60	3387	87	5028	828	556	1383	8102
32485	2094	556	1146	1703	285	125	871	47	175	60	3408	87	5059	830	557	1387	8148
33215	2096	559	1156	1714	287	126	876	47	176	61	3427	88	5087	832	558	1390	8191
33945	2098	561	1164	1725	288	126	880	48	177	61	3446	88	5113	834	560	1394	8231
34675	2100	563	1172	1735	290	127	883	48	177	61	3463	88	5137	836	561	1397	8269
35405	2102	565	1180	1745	291	128	887	48	178	62	3479	88	5160	838	562	1400	8305
36135	2104	567	1187	1754	292	128	890	48	179	62	3494	89	5182	839	563	1402	8338

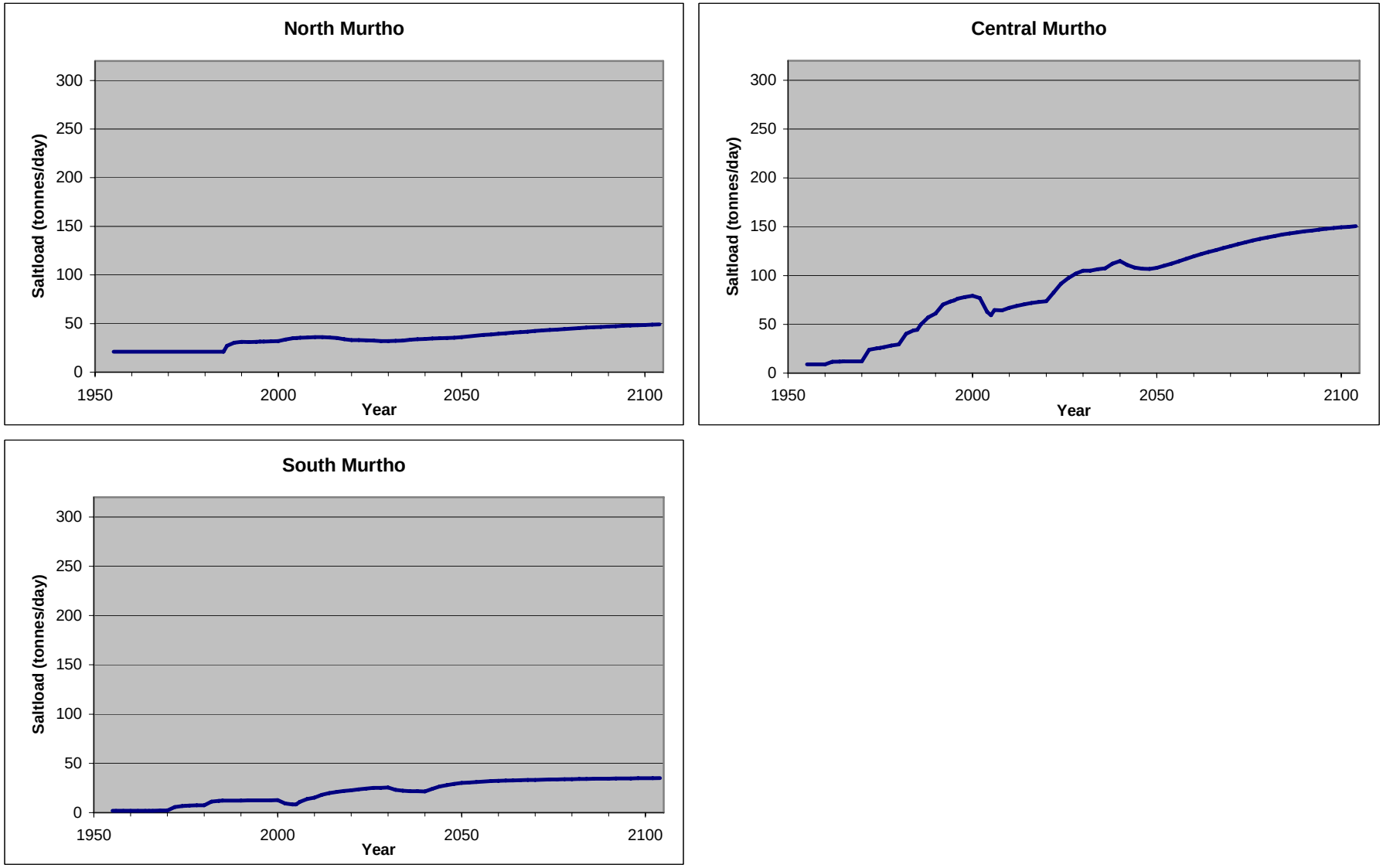
B-1 (S4-2). Modelled groundwater flux (m3/day) from flow budget zones in Scenario-4 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
30	1955	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
365	1956	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1095	1958	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1825	1960	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
2555	1962	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.2	0.0	11.7	0.2	1.9	2.0	34.7
3285	1964	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	34.9
3650	1965	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	35.0
4015	1966	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
4745	1968	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
5475	1970	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.1	0.2	1.9	2.0	35.1
6205	1972	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	20.1	0.1	23.8	3.8	2.1	5.8	50.6
6935	1974	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	21.6	0.1	25.4	4.5	2.2	6.7	53.1
7300	1975	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	22.0	0.1	25.9	4.7	2.2	6.9	53.8
7665	1976	13.3	7.7	21.0	0.6	0.4	1.7	0.8	0.3	0.1	22.6	0.1	26.6	4.9	2.2	7.1	54.7
8395	1978	13.3	7.7	21.0	0.6	0.4	1.8	0.8	0.3	0.1	24.2	0.1	28.3	5.1	2.3	7.3	56.7
9125	1980	13.3	7.7	21.0	0.6	0.4	2.0	0.9	0.3	0.1	25.1	0.1	29.5	5.2	2.3	7.5	58.0
9855	1982	13.3	7.7	21.0	0.7	0.4	6.4	0.9	0.4	0.1	30.7	0.8	40.3	8.1	3.1	11.2	72.5
10585	1984	13.3	7.7	21.0	0.7	0.5	7.0	1.0	0.4	0.2	32.9	0.9	43.6	8.6	3.4	12.0	76.6
10950	1985	13.3	7.7	21.0	0.7	0.5	7.2	1.0	0.4	0.2	33.6	0.9	44.5	8.8	3.4	12.2	77.8
11315	1986	15.2	11.9	27.1	0.8	0.6	10.3	1.0	0.5	0.2	35.5	0.9	49.7	8.9	3.2	12.1	88.9
12045	1988	15.3	15.0	30.3	0.9	0.8	13.5	1.1	0.6	0.2	39.1	0.9	57.1	9.0	3.1	12.1	99.5
12775	1990	15.4	15.8	31.2	1.1	1.0	14.7	1.2	0.7	0.2	41.2	1.0	61.0	9.1	3.1	12.2	104.4
13505	1992	15.2	15.7	31.0	3.7	1.3	18.7	1.2	0.8	0.2	43.4	1.0	70.2	9.2	3.1	12.3	113.5
14235	1994	15.2	16.0	31.2	4.1	1.4	19.4	1.3	0.8	0.2	45.1	1.0	73.4	9.3	3.1	12.4	117.0
14600	1995	15.3	16.1	31.4	4.2	1.5	19.6	1.3	0.8	0.2	45.8	1.0	74.4	9.3	3.2	12.4	118.3
14965	1996	15.3	16.2	31.5	4.3	1.5	20.7	1.3	0.8	0.2	46.3	1.0	76.3	9.3	3.2	12.5	120.2
15695	1998	15.3	16.4	31.7	4.4	1.6	21.1	1.3	0.9	0.2	47.2	1.0	77.9	9.4	3.2	12.5	122.1
16425	2000	15.3	16.6	31.9	4.5	1.7	21.4	1.3	0.9	0.2	48.0	1.0	79.1	9.4	3.2	12.6	123.5
17155	2002	14.5	19.1	33.6	4.7	1.8	21.7	1.4	0.9	0.2	45.7	0.7	77.0	6.6	2.8	9.4	120.0
17885	2004	14.6	20.4	34.9	4.9	1.7	12.5	1.3	0.7	0.2	40.9	0.6	62.8	6.1	2.4	8.5	106.2
18250	2005	14.6	20.7	35.2	4.8	1.6	11.2	1.2	0.6	0.2	39.1	0.6	59.5	5.9	2.4	8.3	103.0
365	2006	14.6	20.9	35.5	4.9	1.6	11.2	1.2	0.6	0.2	44.4	0.6	64.6	6.9	3.9	10.9	111.0
1095	2008	14.6	21.0	35.6	5.1	1.6	11.6	1.1	0.6	0.2	43.3	0.7	64.3	7.9	5.8	13.8	113.6
1825	2010	14.5	21.6	36.1	5.4	1.6	12.1	1.2	0.7	0.2	45.0	0.7	66.9	8.8	6.6	15.4	118.4
2555	2012	14.5	21.6	36.1	5.5	1.7	12.4	1.2	0.7	0.2	46.3	0.9	68.8	10.8	7.3	18.2	123.1
3285	2014	14.4	21.3	35.7	5.5	1.7	12.5	1.2	0.7	0.2	47.6	1.0	70.5	12.0	8.0	19.9	126.1
4015	2016	14.4	20.7	35.1	5.5	1.8	12.6	1.2	0.7	0.2	48.8	1.1	71.9	12.8	8.4	21.1	128.1
4745	2018	14.3	19.5	33.9	5.4	1.8	12.7	1.2	0.7	0.2	49.7	1.1	72.9	13.3	8.7	22.0	128.8
5475	2020	14.3	18.6	32.9	5.3	1.8	12.7	1.3	0.7	0.3	50.4	1.2	73.6	13.8	9.0	22.8	129.3
6205	2022	14.3	18.7	32.9	5.2	1.9	15.7	1.3	0.8	0.3	55.9	1.4	82.5	14.5	9.2	23.6	139.0
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

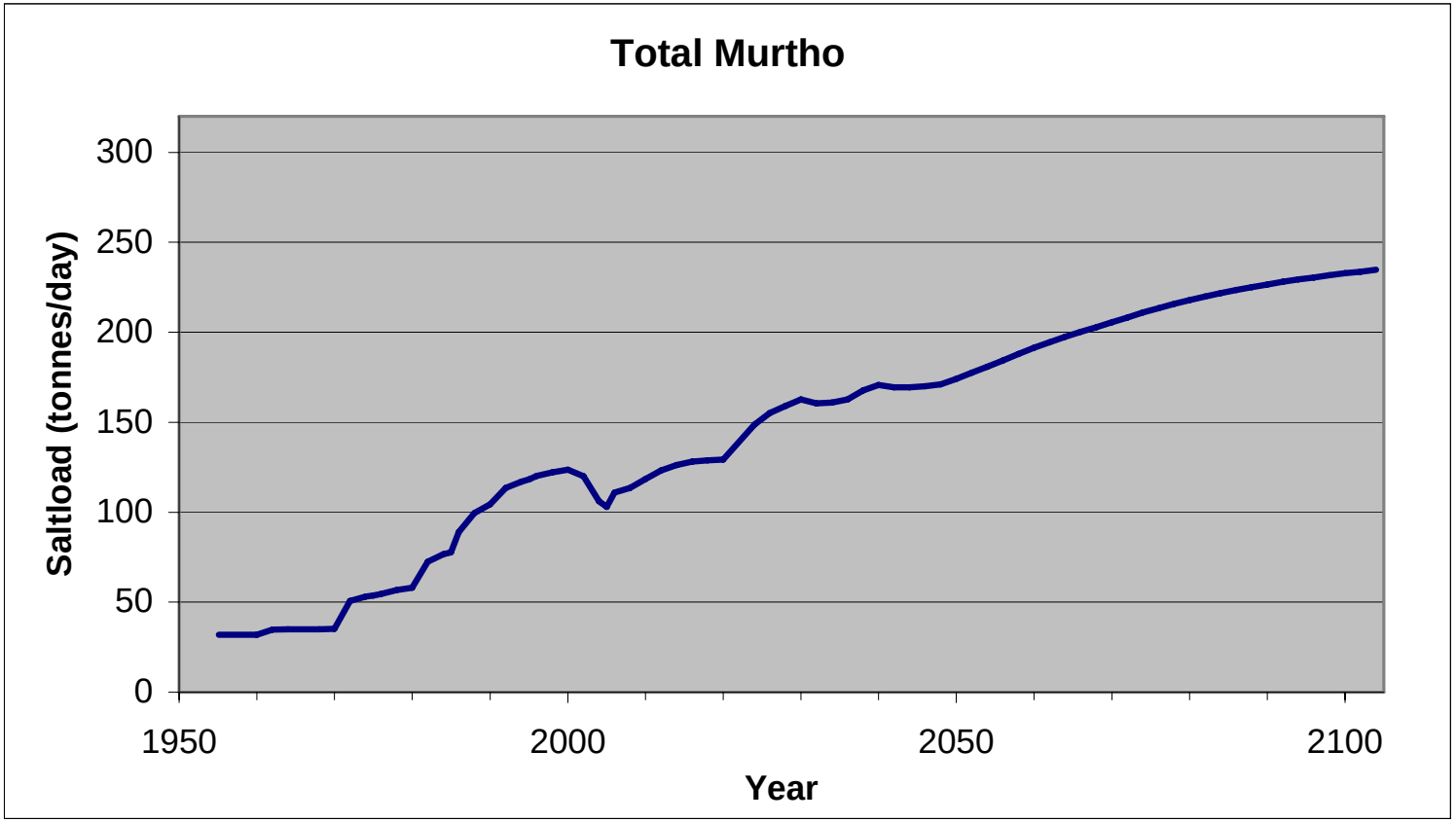
B-1 (S4-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	14.3	18.5	32.7	5.3	2.0	18.0	1.4	0.9	0.3	62.1	1.5	91.4	15.1	9.4	24.5	148.6
7665	2026	14.2	18.1	32.4	5.4	2.1	19.2	1.5	1.0	0.3	66.4	1.6	97.6	15.6	9.5	25.1	155.0
8395	2028	14.2	17.8	32.0	5.5	2.3	20.0	1.5	1.1	0.4	69.6	1.7	101.9	15.6	9.6	25.2	159.1
9125	2030	14.2	17.8	32.1	5.5	2.3	20.5	1.6	1.1	0.4	71.9	1.7	105.0	15.8	9.7	25.5	162.6
9855	2032	14.2	18.0	32.3	5.6	2.4	20.8	1.6	1.2	0.4	71.5	1.7	105.1	15.2	8.0	23.2	160.5
10585	2034	14.3	18.2	32.5	5.6	2.5	21.0	1.6	1.2	0.4	72.4	1.7	106.4	14.9	7.4	22.3	161.1
11315	2036	14.3	19.1	33.4	5.6	2.5	21.2	1.6	1.2	0.4	73.2	1.7	107.4	14.7	7.1	21.8	162.6
12045	2038	14.3	19.6	33.9	5.6	2.5	23.6	1.7	1.3	0.4	75.3	1.7	112.1	14.6	7.1	21.6	167.6
12775	2040	14.3	19.9	34.3	5.6	2.6	24.4	1.7	1.3	0.4	77.1	1.7	114.9	14.5	7.0	21.6	170.8
13505	2042	14.4	20.2	34.6	5.6	2.6	22.3	1.7	1.3	0.4	75.1	1.7	110.8	15.3	8.8	24.1	169.4
14235	2044	14.4	20.4	34.8	5.5	2.6	21.1	1.7	1.2	0.4	73.9	1.8	108.1	16.2	10.2	26.4	169.3
14965	2046	14.4	20.6	35.0	5.3	2.5	20.5	1.7	1.2	0.4	73.5	1.8	106.9	16.9	11.1	28.0	170.0
15695	2048	14.5	20.9	35.4	5.3	2.4	19.7	1.7	1.2	0.4	74.1	1.8	106.6	17.5	11.7	29.2	171.2
16425	2050	14.7	21.4	36.1	5.5	2.4	19.6	1.7	1.2	0.4	75.3	1.9	107.9	18.0	12.1	30.0	174.0
17155	2052	14.8	22.0	36.8	5.7	2.4	19.8	1.7	1.2	0.4	76.9	1.9	110.0	18.3	12.4	30.7	177.5
17885	2054	15.0	22.6	37.5	5.8	2.5	20.1	1.7	1.2	0.4	78.5	1.9	112.1	18.6	12.6	31.2	180.9
18615	2056	15.1	23.1	38.2	6.2	2.7	20.4	1.7	1.2	0.4	79.9	1.9	114.5	18.8	12.8	31.6	184.3
19345	2058	15.2	23.7	38.8	6.5	2.8	20.9	1.7	1.2	0.4	81.5	2.0	117.1	19.1	12.9	32.0	187.9
20075	2060	15.3	24.2	39.5	6.7	2.9	21.4	1.8	1.3	0.4	83.1	2.0	119.6	19.2	13.0	32.3	191.3
20805	2062	15.4	24.7	40.1	6.9	3.0	21.8	1.8	1.3	0.4	84.7	2.0	121.9	19.4	13.1	32.5	194.5
21535	2064	15.5	25.2	40.6	7.1	3.1	22.2	1.8	1.3	0.5	86.1	2.0	124.1	19.5	13.2	32.7	197.4
22265	2066	15.6	25.6	41.2	7.2	3.1	22.5	1.8	1.3	0.5	87.5	2.0	126.1	19.7	13.3	32.9	200.2
22995	2068	15.6	26.1	41.7	7.4	3.2	22.9	1.8	1.4	0.5	88.9	2.0	128.1	19.8	13.4	33.1	202.9
23725	2070	15.7	26.5	42.3	7.5	3.3	23.3	1.9	1.4	0.5	90.3	2.1	130.1	19.9	13.4	33.3	205.6
24455	2072	15.8	27.0	42.8	7.6	3.3	23.6	1.9	1.4	0.5	91.7	2.1	132.1	20.0	13.5	33.4	208.3
25185	2074	15.9	27.4	43.3	7.7	3.4	24.0	1.9	1.4	0.5	93.0	2.1	134.0	20.1	13.5	33.6	210.9
25915	2076	16.0	27.9	43.9	7.8	3.4	24.3	1.9	1.4	0.5	94.3	2.1	135.8	20.1	13.6	33.7	213.4
26645	2078	16.1	28.3	44.4	8.0	3.5	24.6	1.9	1.5	0.5	95.5	2.1	137.5	20.2	13.6	33.8	215.7
27375	2080	16.1	28.7	44.9	8.1	3.5	24.8	1.9	1.5	0.5	96.6	2.1	139.1	20.3	13.7	34.0	217.9
28105	2082	16.2	29.1	45.3	8.1	3.6	25.1	2.0	1.5	0.5	97.6	2.1	140.5	20.4	13.7	34.1	219.9
28835	2084	16.3	29.4	45.8	8.2	3.6	25.3	2.0	1.5	0.5	98.5	2.1	141.8	20.4	13.7	34.2	221.8
29565	2086	16.4	29.8	46.2	8.3	3.6	25.5	2.0	1.5	0.5	99.4	2.2	143.0	20.5	13.8	34.3	223.5
30295	2088	16.5	30.1	46.6	8.4	3.7	25.7	2.0	1.5	0.5	100.2	2.2	144.2	20.6	13.8	34.4	225.1
31025	2090	16.5	30.4	46.9	8.4	3.7	25.8	2.0	1.6	0.5	100.9	2.2	145.2	20.6	13.9	34.5	226.6
31755	2092	16.6	30.7	47.3	8.5	3.7	26.0	2.0	1.6	0.5	101.6	2.2	146.1	20.7	13.9	34.6	228.0
32485	2094	16.7	31.0	47.6	8.6	3.7	26.1	2.0	1.6	0.5	102.2	2.2	147.0	20.7	13.9	34.7	229.3
33215	2096	16.8	31.2	48.0	8.6	3.8	26.3	2.0	1.6	0.5	102.8	2.2	147.8	20.8	14.0	34.8	230.5
33945	2098	16.8	31.4	48.3	8.6	3.8	26.4	2.0	1.6	0.5	103.4	2.2	148.6	20.9	14.0	34.8	231.7
34675	2100	16.9	31.7	48.5	8.7	3.8	26.5	2.1	1.6	0.6	103.9	2.2	149.3	20.9	14.0	34.9	232.7
35405	2102	17.0	31.9	48.8	8.7	3.8	26.6	2.1	1.6	0.6	104.4	2.2	150.0	20.9	14.0	35.0	233.8
36135	2104	17.0	32.1	49.1	8.8	3.8	26.7	2.1	1.6	0.6	104.8	2.2	150.6	21.0	14.1	35.1	234.7
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

B-1 (S4-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Murtho Area)



B-1 (S4-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-4 (Murtho Area)



B-1 (S4-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
30	**1955**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
365	**1956**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1095	**1958**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1825	**1960**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
2555	**1962**	444	283	***727***	21	12	49	19	18	6	273	2	***398***	6	75	***81***	***1207***
3285	**1964**	444	283	***727***	21	12	49	19	18	6	279	2	***405***	6	75	***81***	***1214***
3650	**1965**	444	283	***727***	21	12	49	19	18	6	281	2	***407***	6	75	***81***	***1216***
4015	**1966**	444	283	***727***	21	12	49	19	18	6	282	2	***408***	6	75	***81***	***1217***
4745	**1968**	444	283	***727***	21	12	49	19	18	6	283	2	***410***	6	75	***81***	***1219***
5475	**1970**	444	283	***727***	21	12	49	19	18	6	284	2	***411***	6	75	***81***	***1220***
6205	**1972**	444	284	***727***	21	12	50	19	24	11	670	2	***810***	151	83	***233***	***1771***
6935	**1974**	444	284	***728***	21	12	53	19	27	12	720	3	***867***	181	88	***268***	***1863***
7300	**1975**	444	284	***728***	21	12	54	19	27	12	733	3	***883***	188	89	***277***	***1888***
7665	**1976**	444	284	***728***	21	12	56	19	28	13	754	3	***906***	194	90	***284***	***1918***
8395	**1978**	444	284	***728***	21	13	62	20	31	14	805	4	***968***	202	92	***294***	***1989***
9125	**1980**	444	284	***728***	21	13	67	20	32	14	837	4	***1009***	207	93	***300***	***2037***
9855	**1982**	444	285	***729***	22	14	212	21	41	16	1023	30	***1380***	323	124	***448***	***2556***
10585	**1984**	444	286	***730***	24	16	235	22	47	18	1097	35	***1494***	345	135	***480***	***2703***
10950	**1985**	444	286	***730***	24	17	241	23	49	18	1119	36	***1527***	350	138	***488***	***2745***
11315	**1986**	505	441	***946***	25	19	344	23	54	19	1183	37	***1703***	355	129	***484***	***3133***
12045	**1988**	510	555	***1066***	30	26	450	25	68	21	1302	38	***1961***	361	125	***485***	***3512***
12775	**1990**	513	585	***1098***	37	33	489	27	76	23	1373	38	***2095***	365	125	***489***	***3683***
13505	**1992**	508	583	***1091***	123	42	624	29	85	24	1445	39	***2410***	368	125	***493***	***3993***
14235	**1994**	508	592	***1101***	137	48	647	30	90	25	1504	39	***2520***	370	126	***496***	***4117***
14600	**1995**	509	597	***1105***	141	50	654	30	92	26	1525	39	***2557***	371	126	***498***	***4160***
14965	**1996**	509	601	***1110***	144	52	691	31	93	26	1543	40	***2619***	372	127	***499***	***4227***
15695	**1998**	509	608	***1118***	148	54	705	31	95	26	1575	40	***2675***	374	127	***502***	***4294***
16425	**2000**	510	615	***1125***	152	56	713	31	97	27	1599	40	***2715***	376	128	***504***	***4344***
17155	**2002**	483	708	***1192***	158	59	723	32	97	26	1523	27	***2645***	262	112	***374***	***4210***
17885	**2004**	485	754	***1239***	162	57	417	30	80	24	1364	25	***2158***	242	97	***339***	***3736***
18250	**2005**	486	765	***1251***	162	54	374	28	72	23	1302	25	***2040***	237	94	***331***	***3622***
365	**2006**	487	773	***1260***	163	52	372	27	68	23	1479	24	***2210***	278	158	***435***	***3905***
1095	**2008**	486	777	***1263***	170	52	388	27	70	23	1444	27	***2201***	317	233	***550***	***4014***
1825	**2010**	484	800	***1284***	179	55	403	27	73	24	1501	30	***2291***	350	265	***616***	***4192***
2555	**2012**	483	801	***1284***	183	57	412	28	75	25	1545	34	***2358***	432	294	***726***	***4369***
3285	**2014**	481	787	***1269***	184	58	417	28	77	26	1588	39	***2417***	479	318	***797***	***4483***
4015	**2016**	479	766	***1246***	183	59	421	29	78	27	1625	42	***2465***	510	336	***846***	***4556***
4745	**2018**	477	724	***1201***	180	60	423	29	79	27	1656	45	***2499***	534	348	***882***	***4582***
5475	**2020**	476	689	***1165***	177	61	424	29	80	28	1680	46	***2525***	552	359	***910***	***4600***
6205	**2022**	475	691	***1166***	175	62	524	30	89	30	1863	55	***2829***	578	367	***946***	***4940***

B-1 (S5-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-5 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	475	683	1158	176	67	599	32	104	34	2069	61	3141	604	374	979	5278
7665	2026	475	672	1147	179	71	640	34	115	37	2214	65	3355	623	380	1003	5504
8395	2028	475	659	1134	182	75	665	36	121	39	2319	67	3503	624	384	1008	5645
9125	2030	475	661	1135	184	78	682	36	126	41	2397	69	3612	633	388	1022	5769
9855	2032	475	667	1142	185	80	693	37	129	42	2382	69	3617	608	320	928	5687
10585	2034	475	674	1149	186	82	702	38	131	42	2413	69	3662	595	295	890	5701
11315	2036	476	707	1183	186	83	708	38	133	43	2440	68	3698	587	286	873	5754
12045	2038	477	726	1202	187	85	787	39	140	44	2511	68	3860	583	282	866	5928
12775	2040	477	739	1216	188	87	813	40	145	45	2571	68	3958	582	281	863	6037
13505	2042	478	749	1228	187	88	743	40	142	44	2504	69	3817	612	351	963	6007
14235	2044	479	756	1236	182	86	703	40	135	43	2464	70	3723	649	408	1057	6016
14965	2046	481	762	1243	177	84	683	39	131	43	2452	72	3681	678	444	1122	6046
15695	2048	485	773	1258	178	81	657	39	129	43	2469	73	3670	700	468	1168	6095
16425	2050	490	793	1283	183	80	654	39	129	44	2510	75	3714	718	483	1201	6198
17155	2052	494	815	1309	190	81	661	39	131	45	2564	76	3787	732	495	1227	6323
17885	2054	498	836	1334	195	83	670	39	133	46	2616	77	3860	744	503	1248	6442
18615	2056	502	856	1359	208	88	682	40	136	47	2727	84	4011	789	514	1303	6673
19345	2058	506	877	1383	218	94	697	40	139	49	2809	88	4133	854	536	1390	6905
20075	2060	509	896	1405	225	97	713	41	142	50	2896	92	4258	914	566	1479	7142
20805	2062	512	915	1427	231	100	728	42	146	52	2987	96	4383	964	596	1560	7370
21535	2064	515	933	1449	236	103	742	43	150	54	3075	99	4502	1007	625	1631	7582
22265	2066	549	1070	1619	241	105	765	44	160	58	3374	104	4850	1043	650	1693	8161
22995	2068	574	1187	1761	246	108	789	46	170	62	3660	109	5190	1078	673	1751	8702
23725	2070	593	1275	1868	251	111	814	47	179	66	3912	114	5494	1114	695	1808	9170
24455	2072	609	1343	1952	258	114	840	49	187	70	4136	119	5772	1149	716	1864	9588
25185	2074	622	1399	2021	264	117	866	50	195	74	4338	123	6027	1182	735	1917	9964
25915	2076	651	1471	2122	275	124	900	52	203	77	4561	127	6318	1213	754	1967	10407
26645	2078	685	1555	2240	287	132	933	53	211	81	4777	130	6605	1241	771	2012	10858
27375	2080	711	1628	2339	297	137	964	55	220	84	4966	133	6857	1267	787	2055	11250
28105	2082	732	1689	2421	306	142	992	56	227	87	5130	136	7077	1291	802	2093	11591
28835	2084	748	1743	2491	314	146	1018	57	233	90	5275	139	7272	1313	816	2129	11891
29565	2086	762	1790	2552	322	150	1041	58	239	92	5403	141	7446	1333	828	2161	12159
30295	2088	774	1832	2606	329	153	1063	59	245	94	5522	143	7608	1350	840	2190	12404
31025	2090	785	1871	2656	336	156	1084	60	250	96	5634	145	7760	1367	850	2217	12633
31755	2092	794	1907	2701	342	159	1104	61	255	98	5738	147	7903	1381	860	2241	12845
32485	2094	803	1941	2744	349	162	1123	62	259	100	5833	148	8036	1395	868	2263	13042
33215	2096	811	1973	2784	355	165	1140	63	263	101	5922	150	8158	1407	876	2283	13225
33945	2098	819	2003	2821	360	168	1156	64	267	103	6002	151	8271	1418	884	2302	13394
34675	2100	826	2031	2857	366	170	1171	64	271	104	6077	152	8375	1428	891	2319	13551
35405	2102	833	2058	2891	370	172	1185	65	274	105	6146	153	8471	1438	897	2335	13697
36135	2104	839	2083	2923	375	175	1198	65	277	106	6209	154	8560	1447	903	2350	13833

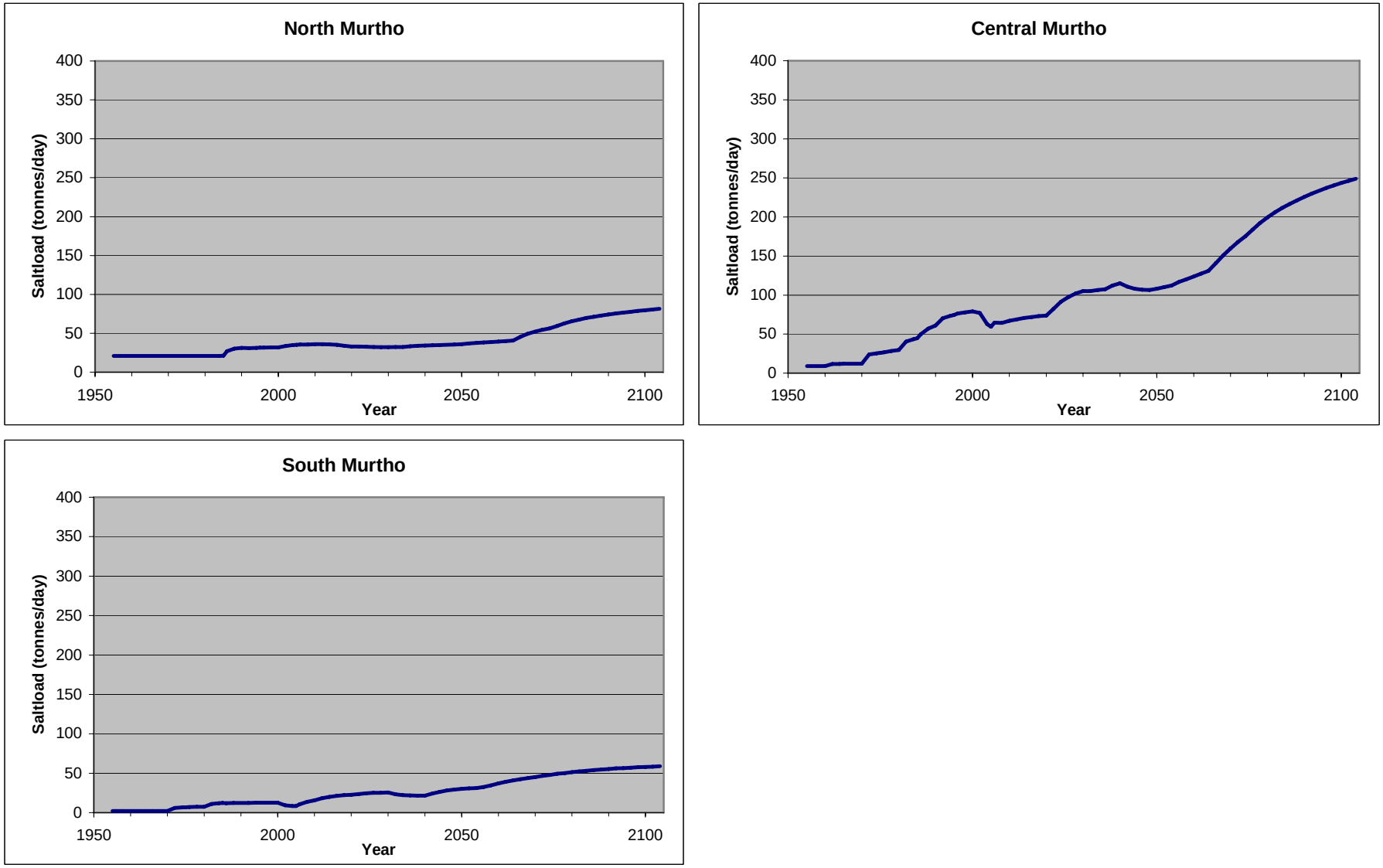
B-1 (S5-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-5 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
30	1955	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
365	1956	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1095	1958	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
1825	1960	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	9.0	0.2	1.9	2.0	32.0
2555	1962	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.2	0.0	11.7	0.2	1.9	2.0	34.7
3285	1964	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	34.9
3650	1965	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	11.9	0.2	1.9	2.0	35.0
4015	1966	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
4745	1968	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.0	0.2	1.9	2.0	35.0
5475	1970	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	12.1	0.2	1.9	2.0	35.1
6205	1972	13.3	7.7	21.0	0.6	0.4	1.5	0.8	0.2	0.1	20.1	0.1	23.8	3.8	2.1	5.8	50.6
6935	1974	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	21.6	0.1	25.4	4.5	2.2	6.7	53.1
7300	1975	13.3	7.7	21.0	0.6	0.4	1.6	0.8	0.2	0.1	22.0	0.1	25.9	4.7	2.2	6.9	53.8
7665	1976	13.3	7.7	21.0	0.6	0.4	1.7	0.8	0.3	0.1	22.6	0.1	26.6	4.9	2.2	7.1	54.7
8395	1978	13.3	7.7	21.0	0.6	0.4	1.8	0.8	0.3	0.1	24.2	0.1	28.3	5.1	2.3	7.3	56.7
9125	1980	13.3	7.7	21.0	0.6	0.4	2.0	0.9	0.3	0.1	25.1	0.1	29.5	5.2	2.3	7.5	58.0
9855	1982	13.3	7.7	21.0	0.7	0.4	6.4	0.9	0.4	0.1	30.7	0.8	40.3	8.1	3.1	11.2	72.5
10585	1984	13.3	7.7	21.0	0.7	0.5	7.0	1.0	0.4	0.2	32.9	0.9	43.6	8.6	3.4	12.0	76.6
10950	1985	13.3	7.7	21.0	0.7	0.5	7.2	1.0	0.4	0.2	33.6	0.9	44.5	8.8	3.4	12.2	77.8
11315	1986	15.2	11.9	27.1	0.8	0.6	10.3	1.0	0.5	0.2	35.5	0.9	49.7	8.9	3.2	12.1	88.9
12045	1988	15.3	15.0	30.3	0.9	0.8	13.5	1.1	0.6	0.2	39.1	0.9	57.1	9.0	3.1	12.1	99.5
12775	1990	15.4	15.8	31.2	1.1	1.0	14.7	1.2	0.7	0.2	41.2	1.0	61.0	9.1	3.1	12.2	104.4
13505	1992	15.2	15.7	31.0	3.7	1.3	18.7	1.2	0.8	0.2	43.4	1.0	70.2	9.2	3.1	12.3	113.5
14235	1994	15.2	16.0	31.2	4.1	1.4	19.4	1.3	0.8	0.2	45.1	1.0	73.4	9.3	3.1	12.4	117.0
14600	1995	15.3	16.1	31.4	4.2	1.5	19.6	1.3	0.8	0.2	45.8	1.0	74.4	9.3	3.2	12.4	118.3
14965	1996	15.3	16.2	31.5	4.3	1.5	20.7	1.3	0.8	0.2	46.3	1.0	76.3	9.3	3.2	12.5	120.2
15695	1998	15.3	16.4	31.7	4.4	1.6	21.1	1.3	0.9	0.2	47.2	1.0	77.9	9.4	3.2	12.5	122.1
16425	2000	15.3	16.6	31.9	4.5	1.7	21.4	1.3	0.9	0.2	48.0	1.0	79.1	9.4	3.2	12.6	123.5
17155	2002	14.5	19.1	33.6	4.7	1.8	21.7	1.4	0.9	0.2	45.7	0.7	77.0	6.6	2.8	9.4	120.0
17885	2004	14.6	20.4	34.9	4.9	1.7	12.5	1.3	0.7	0.2	40.9	0.6	62.8	6.1	2.4	8.5	106.2
18250	2005	14.6	20.7	35.2	4.8	1.6	11.2	1.2	0.6	0.2	39.1	0.6	59.5	5.9	2.4	8.3	103.0
365	2006	14.6	20.9	35.5	4.9	1.6	11.2	1.2	0.6	0.2	44.4	0.6	64.6	6.9	3.9	10.9	111.0
1095	2008	14.6	21.0	35.6	5.1	1.6	11.6	1.1	0.6	0.2	43.3	0.7	64.3	7.9	5.8	13.8	113.6
1825	2010	14.5	21.6	36.1	5.4	1.6	12.1	1.2	0.7	0.2	45.0	0.7	66.9	8.8	6.6	15.4	118.4
2555	2012	14.5	21.6	36.1	5.5	1.7	12.4	1.2	0.7	0.2	46.3	0.9	68.8	10.8	7.3	18.2	123.1
3285	2014	14.4	21.3	35.7	5.5	1.7	12.5	1.2	0.7	0.2	47.6	1.0	70.5	12.0	8.0	19.9	126.1
4015	2016	14.4	20.7	35.1	5.5	1.8	12.6	1.2	0.7	0.2	48.8	1.1	71.9	12.8	8.4	21.1	128.1
4745	2018	14.3	19.5	33.9	5.4	1.8	12.7	1.2	0.7	0.2	49.7	1.1	72.9	13.3	8.7	22.0	128.8
5475	2020	14.3	18.6	32.9	5.3	1.8	12.7	1.3	0.7	0.3	50.4	1.2	73.6	13.8	9.0	22.8	129.3
6205	2022	14.3	18.7	32.9	5.2	1.9	15.7	1.3	0.8	0.3	55.9	1.4	82.5	14.5	9.2	23.6	139.0
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

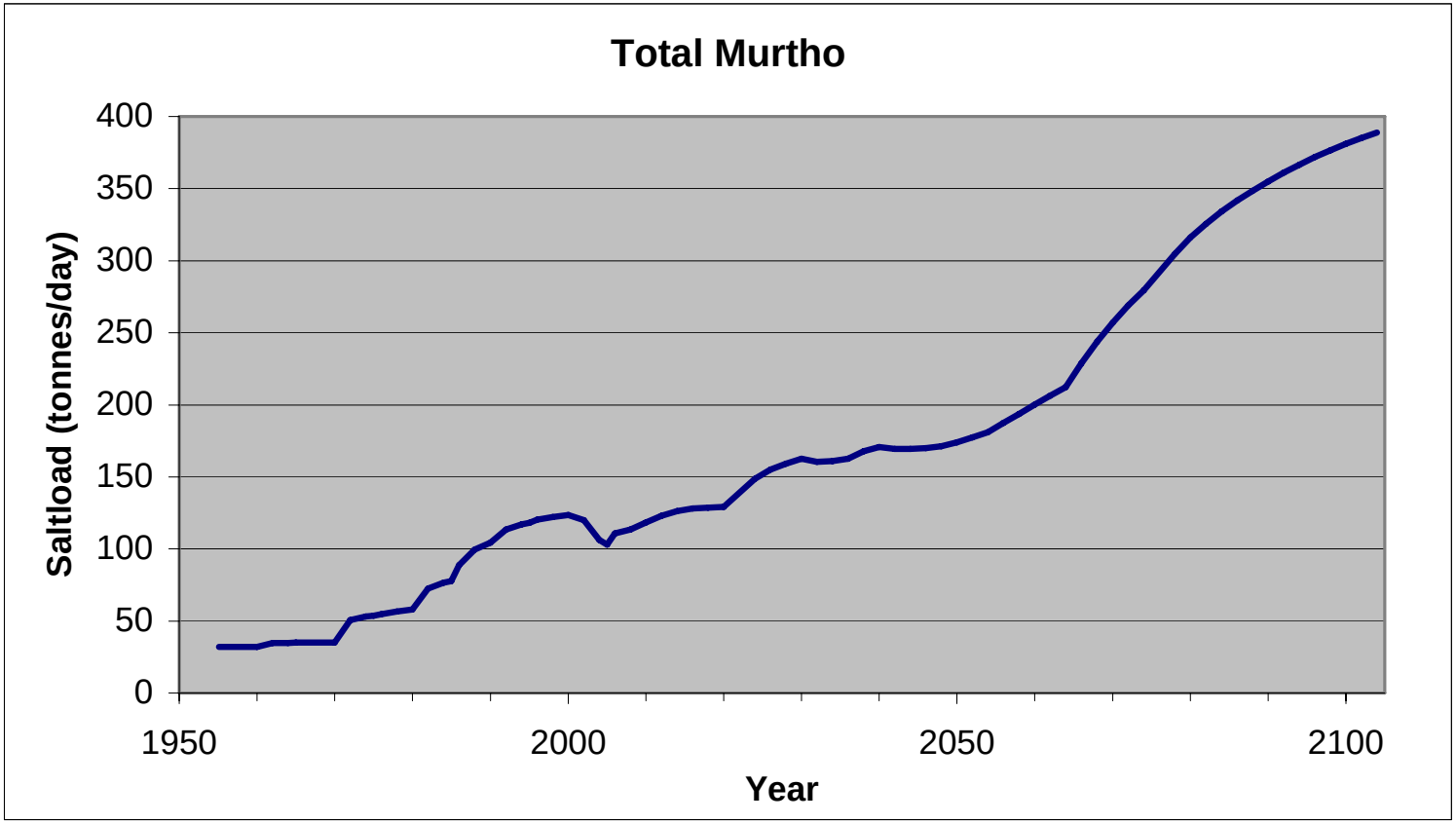
B-1 (S5-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	14.3	18.5	32.7	5.3	2.0	18.0	1.4	0.9	0.3	62.1	1.5	91.4	15.1	9.4	24.5	148.6
7665	2026	14.2	18.1	32.4	5.4	2.1	19.2	1.5	1.0	0.3	66.4	1.6	97.6	15.6	9.5	25.1	155.0
8395	2028	14.2	17.8	32.0	5.5	2.3	20.0	1.5	1.1	0.4	69.6	1.7	101.9	15.6	9.6	25.2	159.1
9125	2030	14.2	17.8	32.1	5.5	2.3	20.5	1.6	1.1	0.4	71.9	1.7	105.0	15.8	9.7	25.5	162.6
9855	2032	14.2	18.0	32.3	5.6	2.4	20.8	1.6	1.2	0.4	71.5	1.7	105.1	15.2	8.0	23.2	160.5
10585	2034	14.3	18.2	32.5	5.6	2.5	21.0	1.6	1.2	0.4	72.4	1.7	106.4	14.9	7.4	22.3	161.1
11315	2036	14.3	19.1	33.4	5.6	2.5	21.2	1.6	1.2	0.4	73.2	1.7	107.4	14.7	7.1	21.8	162.6
12045	2038	14.3	19.6	33.9	5.6	2.5	23.6	1.7	1.3	0.4	75.3	1.7	112.1	14.6	7.1	21.6	167.6
12775	2040	14.3	19.9	34.3	5.6	2.6	24.4	1.7	1.3	0.4	77.1	1.7	114.9	14.5	7.0	21.6	170.8
13505	2042	14.4	20.2	34.6	5.6	2.6	22.3	1.7	1.3	0.4	75.1	1.7	110.8	15.3	8.8	24.1	169.4
14235	2044	14.4	20.4	34.8	5.5	2.6	21.1	1.7	1.2	0.4	73.9	1.8	108.1	16.2	10.2	26.4	169.3
14965	2046	14.4	20.6	35.0	5.3	2.5	20.5	1.7	1.2	0.4	73.5	1.8	106.9	16.9	11.1	28.0	170.0
15695	2048	14.5	20.9	35.4	5.3	2.4	19.7	1.7	1.2	0.4	74.1	1.8	106.6	17.5	11.7	29.2	171.2
16425	2050	14.7	21.4	36.1	5.5	2.4	19.6	1.7	1.2	0.4	75.3	1.9	107.9	18.0	12.1	30.0	174.0
17155	2052	14.8	22.0	36.8	5.7	2.4	19.8	1.7	1.2	0.4	76.9	1.9	110.0	18.3	12.4	30.7	177.5
17885	2054	15.0	22.6	37.5	5.8	2.5	20.1	1.7	1.2	0.4	78.5	1.9	112.2	18.6	12.6	31.2	180.9
18615	2056	15.1	23.1	38.2	6.2	2.7	20.5	1.7	1.2	0.4	81.8	2.1	116.6	19.7	12.8	32.6	187.4
19345	2058	15.2	23.7	38.8	6.5	2.8	20.9	1.7	1.2	0.4	84.3	2.2	120.1	21.4	13.4	34.8	193.7
20075	2060	15.3	24.2	39.5	6.8	2.9	21.4	1.8	1.3	0.5	86.9	2.3	123.8	22.8	14.1	37.0	200.2
20805	2062	15.4	24.7	40.1	6.9	3.0	21.8	1.8	1.3	0.5	89.6	2.4	127.4	24.1	14.9	39.0	206.5
21535	2064	15.5	25.2	40.7	7.1	3.1	22.3	1.8	1.3	0.5	92.3	2.5	130.8	25.2	15.6	40.8	212.3
22265	2066	16.5	28.9	45.4	7.2	3.2	22.9	1.9	1.4	0.5	101.2	2.6	141.0	26.1	16.2	42.3	228.7
22995	2068	17.2	32.1	49.3	7.4	3.2	23.7	2.0	1.5	0.6	109.8	2.7	150.9	27.0	16.8	43.8	243.9
23725	2070	17.8	34.4	52.2	7.5	3.3	24.4	2.0	1.6	0.6	117.3	2.8	159.7	27.8	17.4	45.2	257.1
24455	2072	18.3	36.3	54.5	7.7	3.4	25.2	2.1	1.7	0.6	124.1	3.0	167.8	28.7	17.9	46.6	268.9
25185	2074	18.7	37.8	56.4	7.9	3.5	26.0	2.2	1.8	0.7	130.1	3.1	175.2	29.5	18.4	47.9	279.6
25915	2076	19.5	39.7	59.2	8.2	3.7	27.0	2.2	1.8	0.7	136.8	3.2	183.7	30.3	18.8	49.2	292.1
26645	2078	20.5	42.0	62.5	8.6	4.0	28.0	2.3	1.9	0.7	143.3	3.3	192.1	31.0	19.3	50.3	304.9
27375	2080	21.3	44.0	65.3	8.9	4.1	28.9	2.4	2.0	0.8	149.0	3.3	199.4	31.7	19.7	51.4	316.0
28105	2082	22.0	45.6	67.6	9.2	4.3	29.8	2.4	2.0	0.8	153.9	3.4	205.8	32.3	20.1	52.3	325.7
28835	2084	22.5	47.1	69.5	9.4	4.4	30.5	2.5	2.1	0.8	158.2	3.5	211.4	32.8	20.4	53.2	334.1
29565	2086	22.9	48.3	71.2	9.7	4.5	31.2	2.5	2.2	0.8	162.1	3.5	216.5	33.3	20.7	54.0	341.7
30295	2088	23.2	49.5	72.7	9.9	4.6	31.9	2.6	2.2	0.8	165.7	3.6	221.2	33.8	21.0	54.7	348.6
31025	2090	23.5	50.5	74.1	10.1	4.7	32.5	2.6	2.2	0.9	169.0	3.6	225.6	34.2	21.3	55.4	355.1
31755	2092	23.8	51.5	75.3	10.3	4.8	33.1	2.6	2.3	0.9	172.1	3.7	229.8	34.5	21.5	56.0	361.1
32485	2094	24.1	52.4	76.5	10.5	4.9	33.7	2.7	2.3	0.9	175.0	3.7	233.6	34.9	21.7	56.6	366.7
33215	2096	24.3	53.3	77.6	10.6	5.0	34.2	2.7	2.4	0.9	177.6	3.7	237.2	35.2	21.9	57.1	371.8
33945	2098	24.6	54.1	78.6	10.8	5.0	34.7	2.7	2.4	0.9	180.1	3.8	240.4	35.5	22.1	57.5	376.6
34675	2100	24.8	54.8	79.6	11.0	5.1	35.1	2.8	2.4	0.9	182.3	3.8	243.5	35.7	22.3	58.0	381.1
35405	2102	25.0	55.6	80.6	11.1	5.2	35.6	2.8	2.5	0.9	184.4	3.8	246.2	35.9	22.4	58.4	385.2
36135	2104	25.2	56.3	81.4	11.3	5.2	35.9	2.8	2.5	1.0	186.3	3.9	248.8	36.2	22.6	58.8	389.0
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

B-1 (S5-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Murtho Area)



B-1 (S5-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-5 (Murtho Area)



B-1 (S5-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
30	**1955**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
365	**1956**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1095	**1958**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
1825	**1960**	444	283	***727***	21	12	49	19	17	5	183	2	***307***	6	75	***81***	***1116***
2555	**1962**	444	283	***727***	21	12	49	19	18	6	273	2	***398***	6	75	***81***	***1207***
3285	**1964**	444	283	***727***	21	12	49	19	18	6	279	2	***405***	6	75	***81***	***1214***
3650	**1965**	444	283	***727***	21	12	49	19	18	6	281	2	***407***	6	75	***81***	***1216***
4015	**1966**	444	283	***727***	21	12	49	19	18	6	282	2	***408***	6	75	***81***	***1217***
4745	**1968**	444	283	***727***	21	12	49	19	18	6	283	2	***410***	6	75	***81***	***1219***
5475	**1970**	444	283	***727***	21	12	49	19	18	6	284	2	***411***	6	75	***81***	***1220***
6205	**1972**	444	284	***727***	21	12	50	19	24	11	670	2	***810***	151	83	***233***	***1771***
6935	**1974**	444	284	***728***	21	12	53	19	27	12	720	3	***867***	181	88	***268***	***1863***
7300	**1975**	444	284	***728***	21	12	54	19	27	12	733	3	***883***	188	89	***277***	***1888***
7665	**1976**	444	284	***728***	21	12	56	19	28	13	754	3	***906***	194	90	***284***	***1918***
8395	**1978**	444	284	***728***	21	13	62	20	31	14	805	4	***968***	202	92	***294***	***1989***
9125	**1980**	444	284	***728***	21	13	67	20	32	14	837	4	***1009***	207	93	***300***	***2037***
9855	**1982**	444	285	***729***	22	14	212	21	41	16	1023	30	***1380***	323	124	***448***	***2556***
10585	**1984**	444	286	***730***	24	16	235	22	47	18	1097	35	***1494***	345	135	***480***	***2703***
10950	**1985**	444	286	***730***	24	17	241	23	49	18	1119	36	***1527***	350	138	***488***	***2745***
11315	**1986**	505	441	***946***	25	19	344	23	54	19	1183	37	***1703***	355	129	***484***	***3133***
12045	**1988**	510	555	***1066***	30	26	450	25	68	21	1302	38	***1961***	361	125	***485***	***3512***
12775	**1990**	513	585	***1098***	37	33	489	27	76	23	1373	38	***2095***	365	125	***489***	***3683***
13505	**1992**	508	583	***1091***	123	42	624	29	85	24	1445	39	***2410***	368	125	***493***	***3993***
14235	**1994**	508	592	***1101***	137	48	647	30	90	25	1504	39	***2520***	370	126	***496***	***4117***
14600	**1995**	509	597	***1105***	141	50	654	30	92	26	1525	39	***2557***	371	126	***498***	***4160***
14965	**1996**	509	601	***1110***	144	52	691	31	93	26	1543	40	***2619***	372	127	***499***	***4227***
15695	**1998**	509	608	***1118***	148	54	705	31	95	26	1575	40	***2675***	374	127	***502***	***4294***
16425	**2000**	510	615	***1125***	152	56	713	31	97	27	1599	40	***2715***	376	128	***504***	***4344***
17155	**2002**	483	708	***1192***	158	59	723	32	97	26	1523	27	***2645***	262	112	***374***	***4210***
17885	**2004**	485	754	***1239***	162	57	417	30	80	24	1364	25	***2158***	242	97	***339***	***3736***
18250	**2005**	486	765	***1251***	162	54	374	28	72	23	1302	25	***2040***	237	94	***331***	***3622***
365	**2006**	429	15	***444***	112	31	171	25	21	5	200	0	***566***	128	158	***286***	***1296***
1095	**2008**	423	7	***430***	110	27	165	18	10	3	205	0	***539***	128	187	***316***	***1285***
1825	**2010**	420	6	***426***	115	28	169	18	9	3	206	1	***548***	141	198	***339***	***1312***
2555	**2012**	418	5	***423***	116	29	172	18	9	3	208	2	***556***	192	209	***401***	***1380***
3285	**2014**	416	4	***420***	115	29	173	18	9	3	212	2	***562***	217	218	***436***	***1418***
4015	**2016**	413	4	***417***	114	30	174	18	9	4	215	3	***566***	232	224	***456***	***1440***
4745	**2018**	411	3	***414***	110	30	174	18	10	4	218	3	***567***	242	228	***470***	***1451***
5475	**2020**	410	2	***412***	107	30	174	18	10	4	220	4	***567***	249	231	***481***	***1459***
6205	**2022**	409	2	***411***	105	32	244	19	10	4	214	1	***629***	114	234	***347***	***1388***

B-1 (S6-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-6 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	409	2	410	105	35	290	20	11	5	211	1	679	116	236	352	1441
7665	2026	409	2	410	107	38	314	21	12	6	212	2	711	119	237	357	1478
8395	2028	409	2	410	108	40	328	22	13	7	214	2	733	115	238	353	1497
9125	2030	408	2	410	109	42	337	22	13	7	216	2	749	117	239	357	1516
9855	2032	409	2	410	105	8	40	22	13	7	201	0	398	98	198	296	1104
10585	2034	409	2	410	104	8	39	22	13	7	200	0	395	94	188	283	1088
10950	2035	409	2	411	103	8	39	22	13	7	200	0	393	93	186	279	1083
11315	2036	409	2	411	103	8	39	22	14	7	200	0	394	92	185	277	1082
12045	2038	410	2	411	102	8	52	23	14	8	198	0	405	91	184	276	1092
12775	2040	410	2	412	102	9	57	23	15	8	197	0	411	91	184	275	1098
13505	2042	411	2	413	74	3	22	23	14	8	171	0	315	49	206	255	983
14235	2044	412	2	413	70	2	15	23	14	8	175	0	307	59	223	282	1002
14965	2046	413	2	414	66	2	13	22	14	8	177	0	302	65	234	300	1016
15695	2048	416	2	418	67	2	10	22	14	8	178	0	301	70	241	311	1029
16425	2050	420	2	422	71	2	10	22	14	8	178	0	305	73	246	319	1045
17155	2052	424	2	426	74	2	10	23	14	9	178	0	310	72	245	317	1053
17885	2054	427	2	429	77	2	12	23	14	9	178	0	315	74	247	321	1066
18615	2056	430	2	433	82	3	13	23	15	10	185	0	330	82	251	333	1096
19345	2058	433	3	436	85	3	15	24	16	10	189	0	343	93	258	351	1130
20075	2060	436	3	439	88	4	17	24	17	11	193	0	355	103	268	371	1165
20805	2062	439	4	443	91	5	19	25	17	12	198	0	367	112	278	390	1199
21535	2064	441	5	446	93	5	21	25	18	13	203	0	379	119	287	406	1231
22265	2066	467	44	510	95	6	24	26	20	15	221	0	407	126	294	420	1337
22995	2068	486	75	561	97	7	28	27	22	17	250	0	447	133	301	434	1443
23725	2070	502	96	598	99	8	32	28	24	19	278	0	489	140	308	448	1534
24455	2072	514	112	626	102	9	36	29	26	21	307	0	531	146	314	461	1618
25185	2074	525	125	650	105	10	41	30	29	23	335	0	571	152	321	473	1694
25915	2076	549	149	698	109	12	47	31	31	24	367	0	621	158	326	485	1803
26645	2078	578	176	754	114	14	53	32	33	26	399	0	671	164	332	495	1919
27375	2080	600	198	798	118	16	58	33	35	27	428	0	716	169	336	505	2019
28105	2082	618	218	835	122	17	64	33	37	29	455	0	756	173	341	514	2105
28835	2084	632	235	867	125	18	68	34	38	30	479	0	793	177	345	522	2182
29565	2086	643	252	896	128	19	73	35	40	31	500	0	827	181	349	529	2252
30295	2088	654	270	923	132	20	78	35	41	32	520	0	858	184	352	536	2318
31025	2090	662	286	948	135	21	82	36	43	33	539	0	889	187	355	542	2379
31755	2092	670	300	971	137	22	87	36	44	34	558	0	918	190	358	548	2437
32485	2094	678	314	992	140	23	91	37	46	34	575	0	946	192	361	553	2491
33215	2096	685	328	1012	143	24	94	37	47	35	592	0	972	194	363	558	2542
33945	2098	691	340	1031	145	24	98	38	48	36	607	0	996	196	365	562	2589
34675	2100	697	351	1048	148	25	101	38	49	36	621	0	1018	198	368	566	2632
35405	2102	703	362	1065	150	26	104	39	50	37	634	0	1039	200	369	570	2673
36135	2104	708	373	1081	152	26	107	39	51	37	646	0	1058	202	371	573	2712

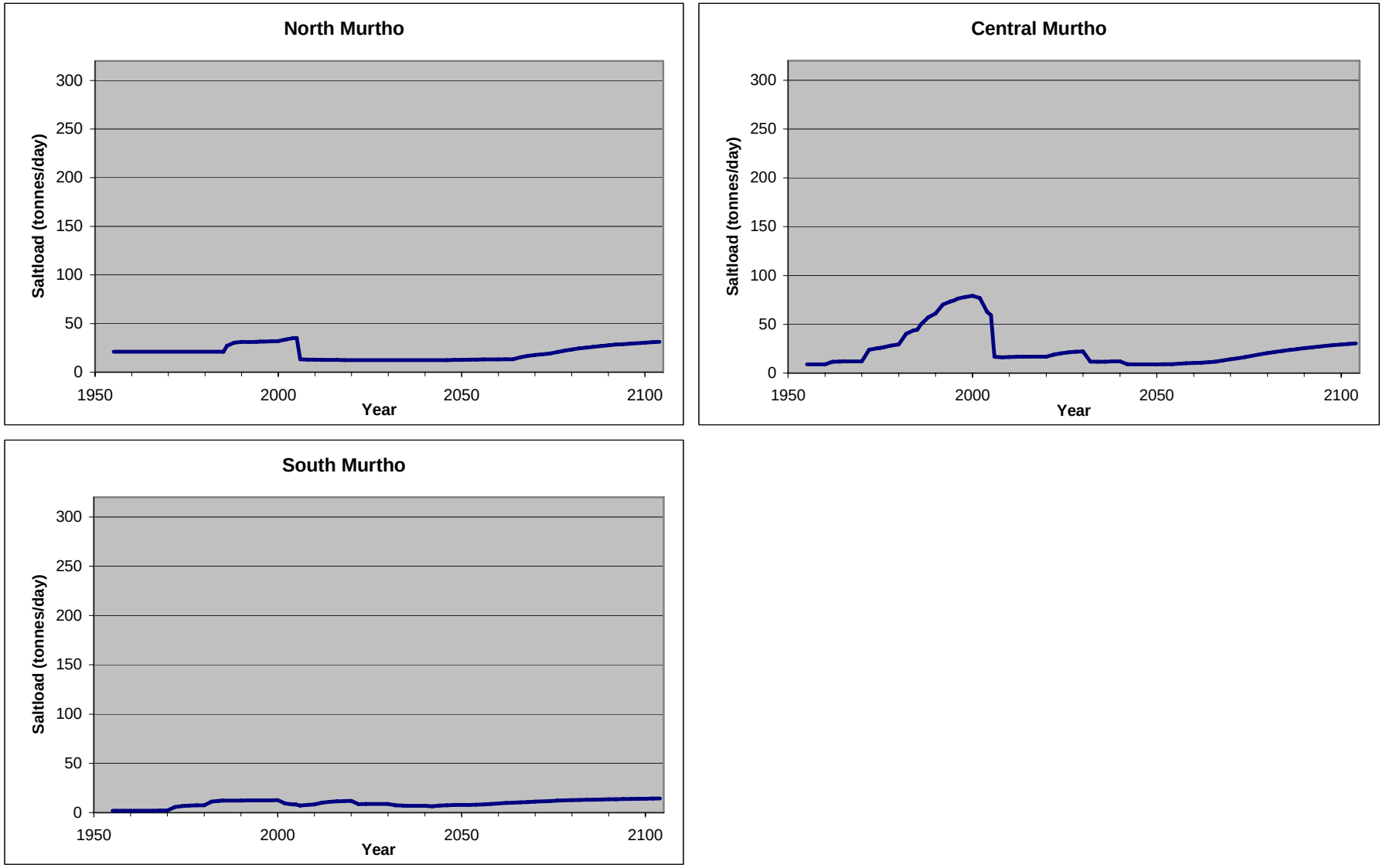
B-1 (S6-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-6 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
Steady State		13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	***9.0***	0.2	1.9	***2.0***	***32.0***
30	**1955**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	***9.0***	0.2	1.9	***2.0***	***32.0***
365	**1956**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	***9.0***	0.2	1.9	***2.0***	***32.0***
1095	**1958**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	***9.0***	0.2	1.9	***2.0***	***32.0***
1825	**1960**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.0	5.5	0.0	***9.0***	0.2	1.9	***2.0***	***32.0***
2555	**1962**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.2	0.0	***11.7***	0.2	1.9	***2.0***	***34.7***
3285	**1964**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	***11.9***	0.2	1.9	***2.0***	***34.9***
3650	**1965**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.4	0.0	***11.9***	0.2	1.9	***2.0***	***35.0***
4015	**1966**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	***12.0***	0.2	1.9	***2.0***	***35.0***
4745	**1968**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	***12.0***	0.2	1.9	***2.0***	***35.0***
5475	**1970**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	8.5	0.0	***12.1***	0.2	1.9	***2.0***	***35.1***
6205	**1972**	13.3	7.7	***21.0***	0.6	0.4	1.5	0.8	0.2	0.1	20.1	0.1	***23.8***	3.8	2.1	***5.8***	***50.6***
6935	**1974**	13.3	7.7	***21.0***	0.6	0.4	1.6	0.8	0.2	0.1	21.6	0.1	***25.4***	4.5	2.2	***6.7***	***53.1***
7300	**1975**	13.3	7.7	***21.0***	0.6	0.4	1.6	0.8	0.2	0.1	22.0	0.1	***25.9***	4.7	2.2	***6.9***	***53.8***
7665	**1976**	13.3	7.7	***21.0***	0.6	0.4	1.7	0.8	0.3	0.1	22.6	0.1	***26.6***	4.9	2.2	***7.1***	***54.7***
8395	**1978**	13.3	7.7	***21.0***	0.6	0.4	1.8	0.8	0.3	0.1	24.2	0.1	***28.3***	5.1	2.3	***7.3***	***56.7***
9125	**1980**	13.3	7.7	***21.0***	0.6	0.4	2.0	0.9	0.3	0.1	25.1	0.1	***29.5***	5.2	2.3	***7.5***	***58.0***
9855	**1982**	13.3	7.7	***21.0***	0.7	0.4	6.4	0.9	0.4	0.1	30.7	0.8	***40.3***	8.1	3.1	***11.2***	***72.5***
10585	**1984**	13.3	7.7	***21.0***	0.7	0.5	7.0	1.0	0.4	0.2	32.9	0.9	***43.6***	8.6	3.4	***12.0***	***76.6***
10950	**1985**	13.3	7.7	***21.0***	0.7	0.5	7.2	1.0	0.4	0.2	33.6	0.9	***44.5***	8.8	3.4	***12.2***	***77.8***
11315	**1986**	15.2	11.9	***27.1***	0.8	0.6	10.3	1.0	0.5	0.2	35.5	0.9	***49.7***	8.9	3.2	***12.1***	***88.9***
12045	**1988**	15.3	15.0	***30.3***	0.9	0.8	13.5	1.1	0.6	0.2	39.1	0.9	***57.1***	9.0	3.1	***12.1***	***99.5***
12775	**1990**	15.4	15.8	***31.2***	1.1	1.0	14.7	1.2	0.7	0.2	41.2	1.0	***61.0***	9.1	3.1	***12.2***	***104.4***
13505	**1992**	15.2	15.7	***31.0***	3.7	1.3	18.7	1.2	0.8	0.2	43.4	1.0	***70.2***	9.2	3.1	***12.3***	***113.5***
14235	**1994**	15.2	16.0	***31.2***	4.1	1.4	19.4	1.3	0.8	0.2	45.1	1.0	***73.4***	9.3	3.1	***12.4***	***117.0***
14600	**1995**	15.3	16.1	***31.4***	4.2	1.5	19.6	1.3	0.8	0.2	45.8	1.0	***74.4***	9.3	3.2	***12.4***	***118.3***
14965	**1996**	15.3	16.2	***31.5***	4.3	1.5	20.7	1.3	0.8	0.2	46.3	1.0	***76.3***	9.3	3.2	***12.5***	***120.2***
15695	**1998**	15.3	16.4	***31.7***	4.4	1.6	21.1	1.3	0.9	0.2	47.2	1.0	***77.9***	9.4	3.2	***12.5***	***122.1***
16425	**2000**	15.3	16.6	***31.9***	4.5	1.7	21.4	1.3	0.9	0.2	48.0	1.0	***79.1***	9.4	3.2	***12.6***	***123.5***
17155	**2002**	14.5	19.1	***33.6***	4.7	1.8	21.7	1.4	0.9	0.2	45.7	0.7	***77.0***	6.6	2.8	***9.4***	***120.0***
17885	**2004**	14.6	20.4	***34.9***	4.9	1.7	12.5	1.3	0.7	0.2	40.9	0.6	***62.8***	6.1	2.4	***8.5***	***106.2***
18250	**2005**	14.6	20.7	***35.2***	4.8	1.6	11.2	1.2	0.6	0.2	39.1	0.6	***59.5***	5.9	2.4	***8.3***	***103.0***
365	**2006**	12.9	0.4	***13.3***	3.4	0.9	5.1	1.1	0.2	0.0	6.0	0.0	***16.7***	3.2	3.9	***7.1***	***37.2***
1095	**2008**	12.7	0.2	***12.9***	3.3	0.8	5.0	0.8	0.1	0.0	6.2	0.0	***16.1***	3.2	4.7	***7.9***	***36.9***
1825	**2010**	12.6	0.2	***12.8***	3.5	0.8	5.1	0.8	0.1	0.0	6.2	0.0	***16.4***	3.5	5.0	***8.5***	***37.6***
2555	**2012**	12.5	0.1	***12.7***	3.5	0.9	5.2	0.8	0.1	0.0	6.2	0.0	***16.6***	4.8	5.2	***10.0***	***39.3***
3285	**2014**	12.5	0.1	***12.6***	3.5	0.9	5.2	0.8	0.1	0.0	6.4	0.1	***16.8***	5.4	5.5	***10.9***	***40.3***
4015	**2016**	12.4	0.1	***12.5***	3.4	0.9	5.2	0.8	0.1	0.0	6.4	0.1	***16.9***	5.8	5.6	***11.4***	***40.8***
4745	**2018**	12.3	0.1	***12.4***	3.3	0.9	5.2	0.8	0.1	0.0	6.5	0.1	***16.9***	6.0	5.7	***11.8***	***41.1***
5475	**2020**	12.3	0.1	***12.3***	3.2	0.9	5.2	0.8	0.1	0.0	6.6	0.1	***16.9***	6.2	5.8	***12.0***	***41.3***
6205	**2022**	12.3	0.0	***12.3***	3.2	0.9	7.3	0.8	0.1	0.0	6.4	0.0	***18.8***	2.8	5.8	***8.7***	***39.8***
Salinity (mg/L)		*30,000*	*27,000*		*30,000*	*30,000*	*30,000*	*43,000*	*9,000*	*9,000*	*30,000*	*25,000*		*25,000*	*25,000*		

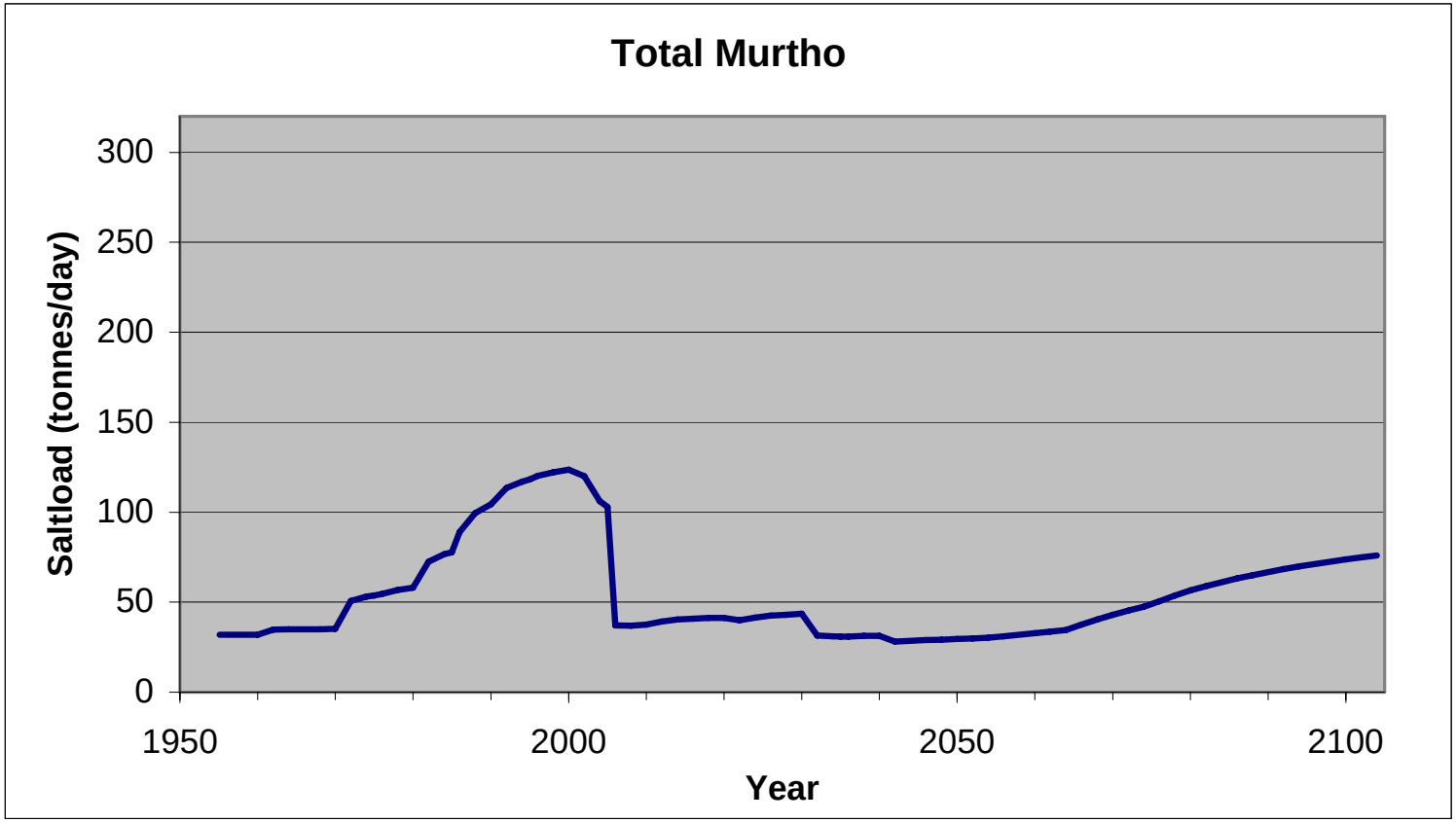
B-1 (S6-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Murtho Area)

Day	Year	North Murtho		North Murtho TOTAL	Central Murtho								Central Murtho TOTAL	South Murtho		South Murtho TOTAL	MURTHO TOTAL
		Z1 to Z51	Z1 to Z3		Z1 to Z17	Z1 to Z16	Z1 to Z15	Z1 to Z13	Z1 to Z14	Z1 to Z18	Z1 to Z4	Z1 to Z12		Z1 to Z5	Z1 to Z6		
6935	2024	12.3	0.0	12.3	3.2	1.0	8.7	0.9	0.1	0.0	6.3	0.0	20.3	2.9	5.9	8.8	41.4
7665	2026	12.3	0.0	12.3	3.2	1.1	9.4	0.9	0.1	0.1	6.4	0.0	21.2	3.0	5.9	8.9	42.4
8395	2028	12.3	0.0	12.3	3.2	1.2	9.8	0.9	0.1	0.1	6.4	0.1	21.9	2.9	6.0	8.8	43.0
9125	2030	12.3	0.0	12.3	3.3	1.3	10.1	1.0	0.1	0.1	6.5	0.1	22.3	2.9	6.0	8.9	43.5
9855	2032	12.3	0.0	12.3	3.2	0.2	1.2	1.0	0.1	0.1	6.0	0.0	11.8	2.4	5.0	7.4	31.5
10585	2034	12.3	0.0	12.3	3.1	0.2	1.2	1.0	0.1	0.1	6.0	0.0	11.7	2.4	4.7	7.1	31.1
10950	2035	12.3	0.0	12.3	3.1	0.2	1.2	1.0	0.1	0.1	6.0	0.0	11.6	2.3	4.7	7.0	30.9
11315	2036	12.3	0.0	12.3	3.1	0.2	1.2	1.0	0.1	0.1	6.0	0.0	11.7	2.3	4.6	6.9	30.9
12045	2038	12.3	0.0	12.3	3.1	0.2	1.6	1.0	0.1	0.1	5.9	0.0	12.0	2.3	4.6	6.9	31.2
12775	2040	12.3	0.0	12.4	3.1	0.3	1.7	1.0	0.1	0.1	5.9	0.0	12.2	2.3	4.6	6.9	31.4
13505	2042	12.3	0.0	12.4	2.2	0.1	0.7	1.0	0.1	0.1	5.1	0.0	9.3	1.2	5.1	6.4	28.0
14235	2044	12.3	0.0	12.4	2.1	0.1	0.5	1.0	0.1	0.1	5.3	0.0	9.0	1.5	5.6	7.1	28.5
14965	2046	12.4	0.0	12.4	2.0	0.1	0.4	1.0	0.1	0.1	5.3	0.0	8.9	1.6	5.9	7.5	28.8
15695	2048	12.5	0.0	12.5	2.0	0.1	0.3	1.0	0.1	0.1	5.3	0.0	8.9	1.7	6.0	7.8	29.2
16425	2050	12.6	0.0	12.6	2.1	0.1	0.3	1.0	0.1	0.1	5.3	0.0	9.0	1.8	6.2	8.0	29.6
17155	2052	12.7	0.1	12.8	2.2	0.1	0.3	1.0	0.1	0.1	5.3	0.0	9.1	1.8	6.1	7.9	29.8
17885	2054	12.8	0.1	12.9	2.3	0.1	0.3	1.0	0.1	0.1	5.3	0.0	9.3	1.8	6.2	8.0	30.2
18615	2056	12.9	0.1	13.0	2.5	0.1	0.4	1.0	0.1	0.1	5.6	0.0	9.7	2.1	6.3	8.3	31.0
19345	2058	13.0	0.1	13.1	2.6	0.1	0.4	1.0	0.1	0.1	5.7	0.0	10.0	2.3	6.4	8.8	31.9
20075	2060	13.1	0.1	13.2	2.6	0.1	0.5	1.0	0.1	0.1	5.8	0.0	10.4	2.6	6.7	9.3	32.8
20805	2062	13.2	0.1	13.3	2.7	0.1	0.6	1.1	0.2	0.1	5.9	0.0	10.7	2.8	6.9	9.7	33.7
21535	2064	13.2	0.1	13.4	2.8	0.2	0.6	1.1	0.2	0.1	6.1	0.0	11.0	3.0	7.2	10.1	34.5
22265	2066	14.0	1.2	15.2	2.8	0.2	0.7	1.1	0.2	0.1	6.6	0.0	11.8	3.1	7.4	10.5	37.5
22995	2068	14.6	2.0	16.6	2.9	0.2	0.8	1.2	0.2	0.2	7.5	0.0	13.0	3.3	7.5	10.8	40.4
23725	2070	15.1	2.6	17.7	3.0	0.2	1.0	1.2	0.2	0.2	8.4	0.0	14.1	3.5	7.7	11.2	43.0
24455	2072	15.4	3.0	18.5	3.1	0.3	1.1	1.2	0.2	0.2	9.2	0.0	15.3	3.7	7.9	11.5	45.3
25185	2074	15.8	3.4	19.1	3.1	0.3	1.2	1.3	0.3	0.2	10.0	0.0	16.5	3.8	8.0	11.8	47.4
25915	2076	16.5	4.0	20.5	3.3	0.4	1.4	1.3	0.3	0.2	11.0	0.0	17.9	4.0	8.2	12.1	50.5
26645	2078	17.3	4.7	22.1	3.4	0.4	1.6	1.4	0.3	0.2	12.0	0.0	19.3	4.1	8.3	12.4	53.8
27375	2080	18.0	5.3	23.4	3.5	0.5	1.7	1.4	0.3	0.2	12.9	0.0	20.6	4.2	8.4	12.6	56.6
28105	2082	18.5	5.9	24.4	3.7	0.5	1.9	1.4	0.3	0.3	13.7	0.0	21.8	4.3	8.5	12.8	59.0
28835	2084	18.9	6.4	25.3	3.8	0.5	2.1	1.5	0.3	0.3	14.4	0.0	22.8	4.4	8.6	13.0	61.2
29565	2086	19.3	6.8	26.1	3.9	0.6	2.2	1.5	0.4	0.3	15.0	0.0	23.8	4.5	8.7	13.2	63.1
30295	2088	19.6	7.3	26.9	3.9	0.6	2.3	1.5	0.4	0.3	15.6	0.0	24.7	4.6	8.8	13.4	65.0
31025	2090	19.9	7.7	27.6	4.0	0.6	2.5	1.5	0.4	0.3	16.2	0.0	25.6	4.7	8.9	13.6	66.7
31755	2092	20.1	8.1	28.2	4.1	0.7	2.6	1.6	0.4	0.3	16.7	0.0	26.4	4.7	9.0	13.7	68.3
32485	2094	20.3	8.5	28.8	4.2	0.7	2.7	1.6	0.4	0.3	17.3	0.0	27.2	4.8	9.0	13.8	69.8
33215	2096	20.5	8.8	29.4	4.3	0.7	2.8	1.6	0.4	0.3	17.8	0.0	27.9	4.9	9.1	13.9	71.2
33945	2098	20.7	9.2	29.9	4.4	0.7	2.9	1.6	0.4	0.3	18.2	0.0	28.6	4.9	9.1	14.0	72.6
34675	2100	20.9	9.5	30.4	4.4	0.7	3.0	1.6	0.4	0.3	18.6	0.0	29.3	5.0	9.2	14.1	73.8
35405	2102	21.1	9.8	30.9	4.5	0.8	3.1	1.7	0.5	0.3	19.0	0.0	29.8	5.0	9.2	14.2	74.9
36135	2104	21.2	10.1	31.3	4.6	0.8	3.2	1.7	0.5	0.3	19.4	0.0	30.4	5.0	9.3	14.3	76.0
Salinity (mg/L)		30,000	27,000		30,000	30,000	30,000	43,000	9,000	9,000	30,000	25,000		25,000	25,000		

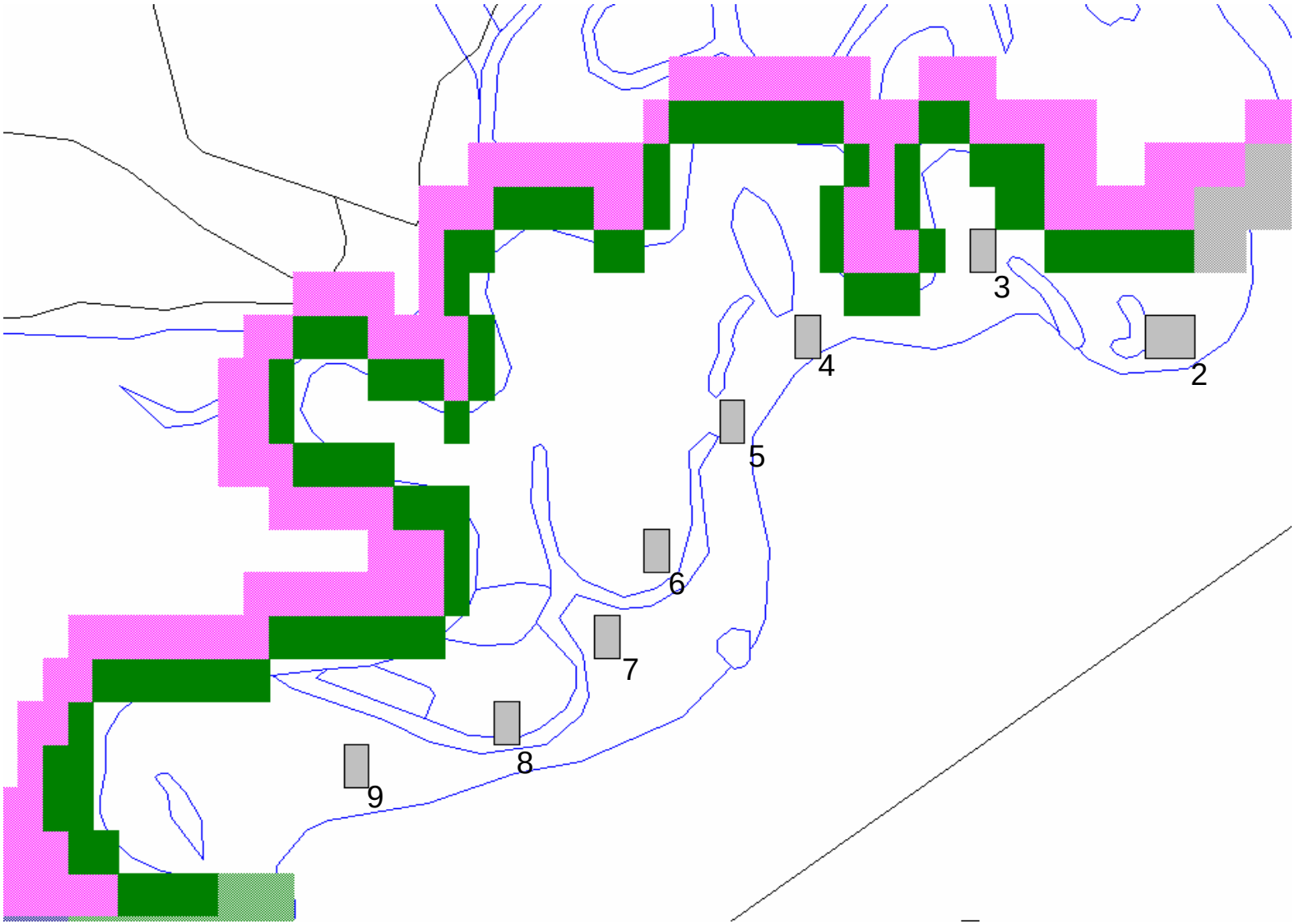
B-1 (S6-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Murtho Area)



B-1 (S6-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-6 (Murtho Area)



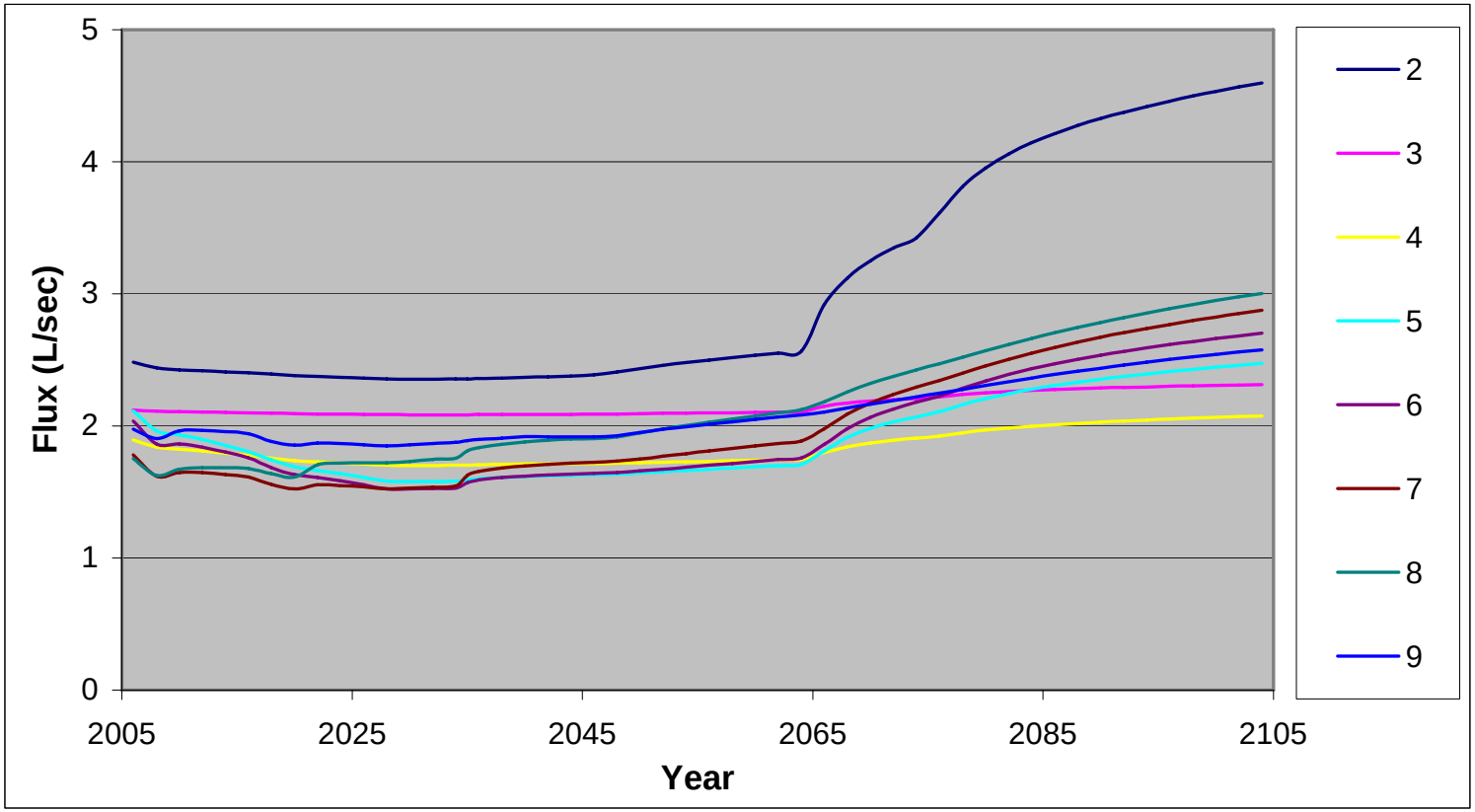
B-1 (S6-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Murtho Area)



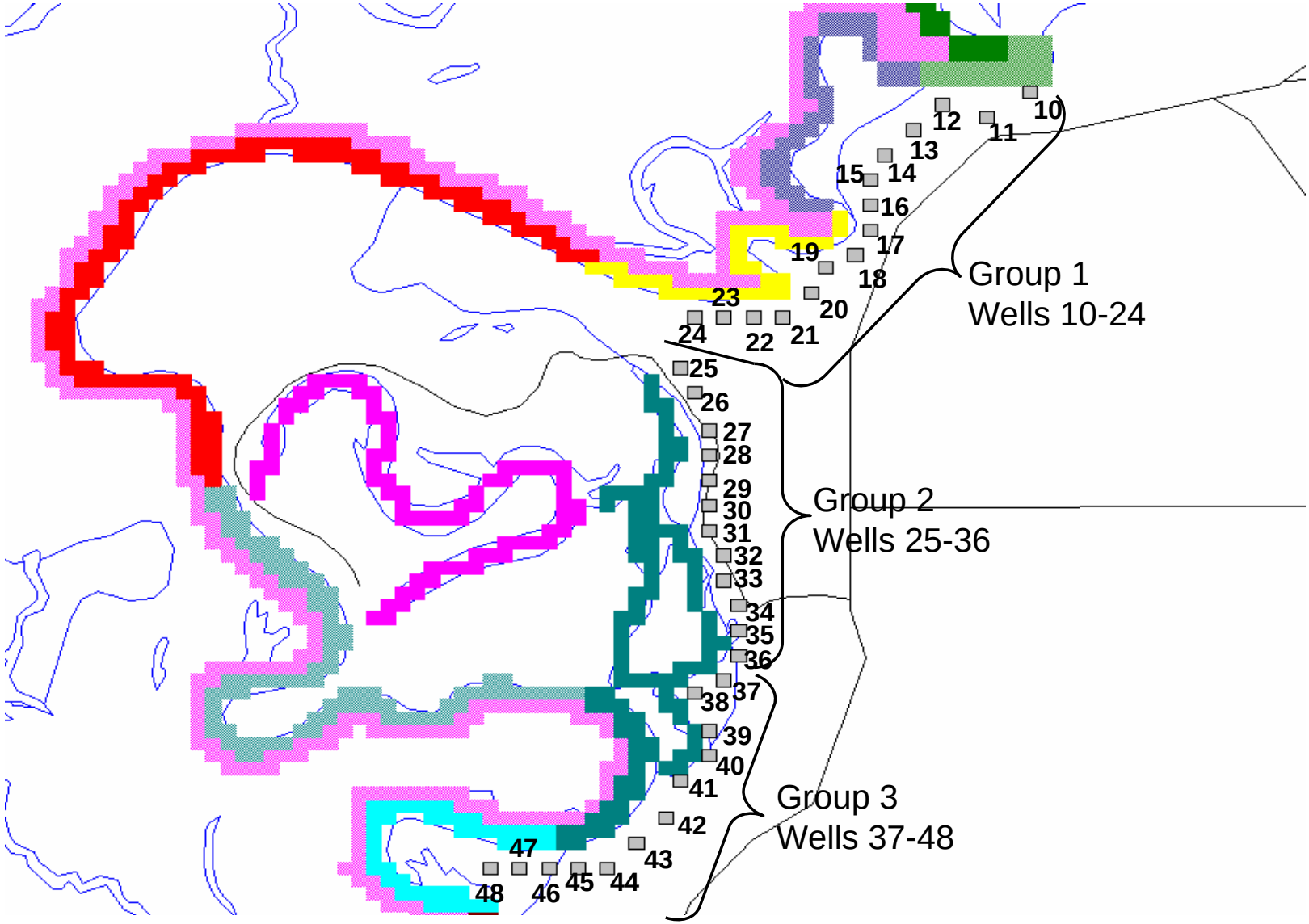
B-1 (S6-7). Murtho concept SIS wells in the North Murtho Area (Scenario-6)

	SIS well #								
Year	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**
2006	2.5	2.1	1.9	2.1	2.0	1.8	1.8	2.0	**16.2**
2008	2.4	2.1	1.8	2.0	1.9	1.6	1.6	1.9	**15.4**
2010	2.4	2.1	1.8	1.9	1.9	1.6	1.7	2.0	**15.4**
2012	2.4	2.1	1.8	1.9	1.8	1.6	1.7	2.0	**15.4**
2014	2.4	2.1	1.8	1.9	1.8	1.6	1.7	2.0	**15.2**
2016	2.4	2.1	1.8	1.8	1.8	1.6	1.7	1.9	**15.1**
2018	2.4	2.1	1.8	1.7	1.7	1.6	1.6	1.9	**14.7**
2020	2.4	2.1	1.7	1.7	1.6	1.5	1.6	1.9	**14.5**
2022	2.4	2.1	1.7	1.7	1.6	1.6	1.7	1.9	**14.6**
2024	2.4	2.1	1.7	1.6	1.6	1.5	1.7	1.9	**14.5**
2026	2.4	2.1	1.7	1.6	1.6	1.5	1.7	1.9	**14.4**
2028	2.4	2.1	1.7	1.6	1.5	1.5	1.7	1.8	**14.3**
2030	2.4	2.1	1.7	1.6	1.5	1.5	1.7	1.9	**14.4**
2032	2.4	2.1	1.7	1.6	1.5	1.5	1.7	1.9	**14.4**
2034	2.4	2.1	1.7	1.6	1.5	1.5	1.8	1.9	**14.4**
2035	2.4	2.1	1.7	1.6	1.6	1.6	1.8	1.9	**14.6**
2036	2.4	2.1	1.7	1.6	1.6	1.7	1.8	1.9	**14.7**
2038	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**14.8**
2040	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**14.9**
2042	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**14.9**
2044	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**15.0**
2046	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**15.0**
2048	2.4	2.1	1.7	1.6	1.6	1.7	1.9	1.9	**15.1**
2050	2.4	2.1	1.7	1.6	1.7	1.8	1.9	1.9	**15.2**
2052	2.5	2.1	1.7	1.7	1.7	1.8	2.0	2.0	**15.3**
2054	2.5	2.1	1.7	1.7	1.7	1.8	2.0	2.0	**15.4**
2056	2.5	2.1	1.7	1.7	1.7	1.8	2.0	2.0	**15.6**
2058	2.5	2.1	1.7	1.7	1.7	1.8	2.1	2.0	**15.7**
2060	2.5	2.1	1.7	1.7	1.7	1.8	2.1	2.0	**15.8**
2062	2.6	2.1	1.7	1.7	1.7	1.9	2.1	2.1	**15.9**
2064	2.6	2.1	1.7	1.7	1.8	1.9	2.1	2.1	**16.0**
2066	2.9	2.1	1.8	1.8	1.9	2.0	2.2	2.1	**16.8**
2068	3.1	2.2	1.8	1.9	2.0	2.1	2.3	2.1	**17.5**
2070	3.2	2.2	1.9	2.0	2.1	2.2	2.3	2.2	**18.0**
2072	3.3	2.2	1.9	2.0	2.1	2.2	2.4	2.2	**18.4**
2074	3.4	2.2	1.9	2.1	2.2	2.3	2.4	2.2	**18.7**
2076	3.6	2.2	1.9	2.1	2.2	2.3	2.5	2.2	**19.2**
2078	3.8	2.2	1.9	2.2	2.3	2.4	2.5	2.3	**19.6**
2080	4.0	2.3	2.0	2.2	2.3	2.5	2.6	2.3	**20.1**
2082	4.1	2.3	2.0	2.2	2.4	2.5	2.6	2.3	**20.4**
2084	4.1	2.3	2.0	2.3	2.4	2.6	2.7	2.4	**20.7**
2086	4.2	2.3	2.0	2.3	2.5	2.6	2.7	2.4	**21.0**
2088	4.3	2.3	2.0	2.3	2.5	2.6	2.7	2.4	**21.2**
2090	4.3	2.3	2.0	2.4	2.5	2.7	2.8	2.4	**21.4**
2092	4.4	2.3	2.0	2.4	2.6	2.7	2.8	2.5	**21.6**
2094	4.4	2.3	2.0	2.4	2.6	2.7	2.9	2.5	**21.8**
2096	4.5	2.3	2.1	2.4	2.6	2.8	2.9	2.5	**22.0**
2098	4.5	2.3	2.1	2.4	2.6	2.8	2.9	2.5	**22.2**
2100	4.5	2.3	2.1	2.4	2.7	2.8	2.9	2.5	**22.3**
2102	4.6	2.3	2.1	2.5	2.7	2.9	3.0	2.6	**22.5**
2104	4.6	2.3	2.1	2.5	2.7	2.9	3.0	2.6	**22.6**

B-1 (S6-8). Predicted range of pumping rates (Litres/second) for SIS wells in the North Murtho Area (Scenario-6)



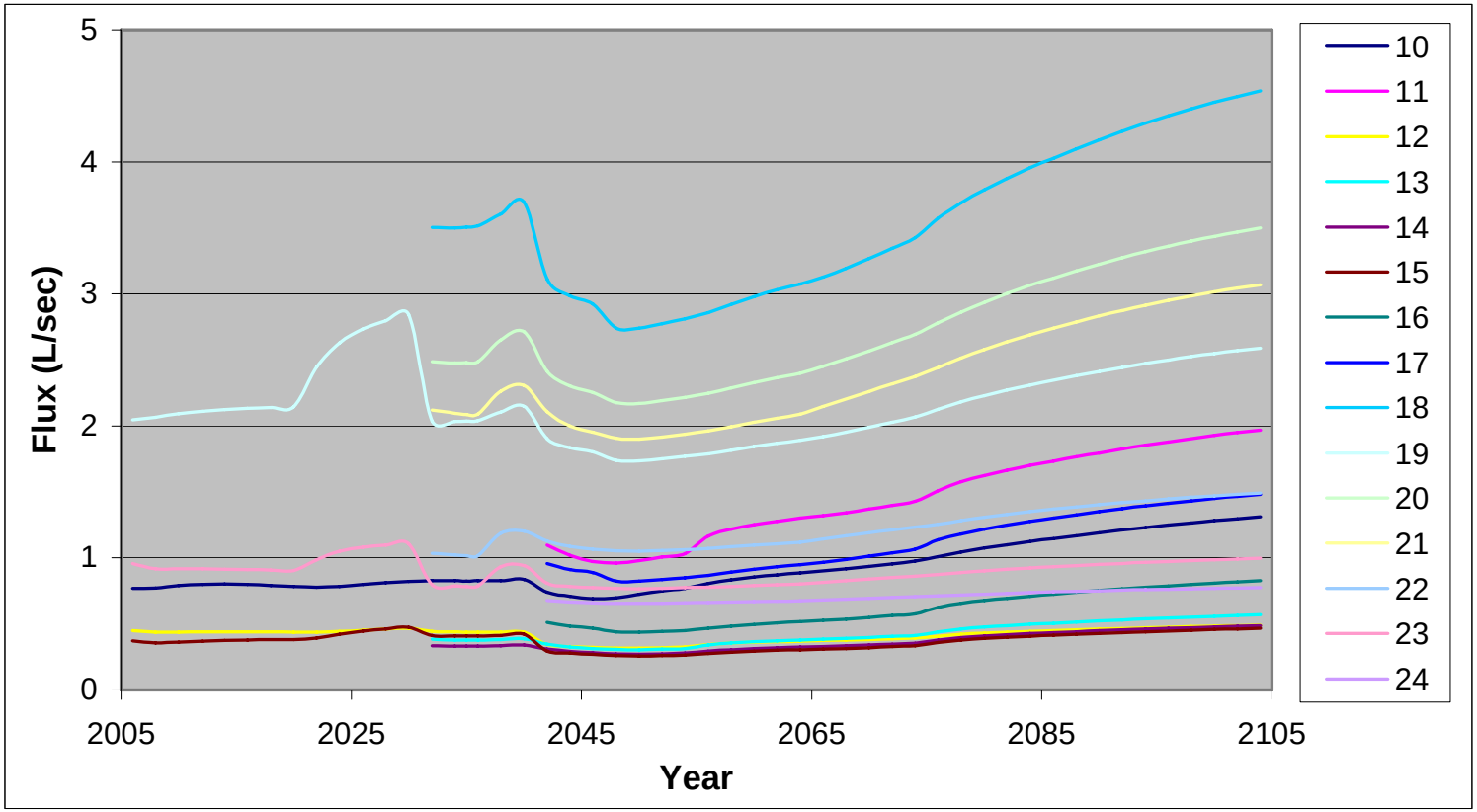
B-1 (S6-9). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the North Murtho Area (Scenario-6)



B-1 (S6-10). Murtho concept SIS wells in the Central Murtho Area (Scenario-6)

	SIS well #															
Year	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
2006	0.8		0.4			0.4				2.0				1.0		**4.6**
2008	0.8		0.4			0.4				2.1				0.9		**4.5**
2010	0.8		0.4			0.4				2.1				0.9		**4.6**
2012	0.8		0.4			0.4				2.1				0.9		**4.6**
2014	0.8		0.4			0.4				2.1				0.9		**4.7**
2016	0.8		0.4			0.4				2.1				0.9		**4.7**
2018	0.8		0.4			0.4				2.1				0.9		**4.7**
2020	0.8		0.4			0.4				2.1				0.9		**4.7**
2022	0.8		0.4			0.4				2.4				1.0		**5.0**
2024	0.8		0.4			0.4				2.6				1.1		**5.3**
2026	0.8		0.5			0.4				2.7				1.1		**5.5**
2028	0.8		0.5			0.5				2.8				1.1		**5.6**
2030	0.8		0.5			0.5				2.8				1.1		**5.7**
2032	0.8		0.4	0.4	0.3	0.4			3.5	2.0	2.5	2.1	1.0	0.8		**14.4**
2034	0.8		0.4	0.4	0.3	0.4			3.5	2.0	2.5	2.1	1.0	0.8		**14.3**
2035	0.8		0.4	0.4	0.3	0.4			3.5	2.0	2.5	2.1	1.0	0.8		**14.3**
2036	0.8		0.4	0.4	0.3	0.4			3.5	2.0	2.5	2.1	1.0	0.8		**14.3**
2038	0.8		0.4	0.4	0.3	0.4			3.6	2.1	2.6	2.3	1.2	0.9		**15.1**
2040	0.8		0.4	0.4	0.3	0.4			3.7	2.1	2.7	2.3	1.2	0.9		**15.4**
2042	0.7	1.1	0.3	0.3	0.3	0.3	0.5	1.0	3.1	1.9	2.4	2.1	1.1	0.8	0.7	**16.8**
2044	0.7	1.0	0.3	0.3	0.3	0.3	0.5	0.9	3.0	1.8	2.3	2.0	1.1	0.8	0.7	**16.0**
2046	0.7	1.0	0.3	0.3	0.3	0.3	0.5	0.9	2.9	1.8	2.3	2.0	1.1	0.8	0.7	**15.6**
2048	0.7	1.0	0.3	0.3	0.3	0.3	0.4	0.8	2.7	1.7	2.2	1.9	1.1	0.8	0.7	**15.1**
2050	0.7	1.0	0.3	0.3	0.3	0.3	0.4	0.8	2.7	1.7	2.2	1.9	1.1	0.8	0.7	**15.1**
2052	0.7	1.0	0.3	0.3	0.3	0.3	0.4	0.8	2.8	1.8	2.2	1.9	1.1	0.8	0.7	**15.3**
2054	0.8	1.0	0.3	0.3	0.3	0.3	0.5	0.8	2.8	1.8	2.2	1.9	1.1	0.8	0.7	**15.5**
2056	0.8	1.2	0.3	0.3	0.3	0.3	0.5	0.9	2.9	1.8	2.2	2.0	1.1	0.8	0.7	**15.9**
2058	0.8	1.2	0.4	0.4	0.3	0.3	0.5	0.9	2.9	1.8	2.3	2.0	1.1	0.8	0.7	**16.3**
2060	0.9	1.3	0.4	0.4	0.3	0.3	0.5	0.9	3.0	1.8	2.3	2.0	1.1	0.8	0.7	**16.6**
2062	0.9	1.3	0.4	0.4	0.3	0.3	0.5	0.9	3.0	1.9	2.4	2.1	1.1	0.8	0.7	**16.8**
2064	0.9	1.3	0.4	0.4	0.3	0.3	0.5	0.9	3.1	1.9	2.4	2.1	1.1	0.8	0.7	**17.1**
2066	0.9	1.3	0.4	0.4	0.3	0.3	0.5	1.0	3.1	1.9	2.5	2.1	1.1	0.8	0.7	**17.4**
2068	0.9	1.3	0.4	0.4	0.3	0.3	0.5	1.0	3.2	2.0	2.5	2.2	1.2	0.8	0.7	**17.7**
2070	0.9	1.4	0.4	0.4	0.3	0.3	0.5	1.0	3.3	2.0	2.6	2.3	1.2	0.8	0.7	**18.1**
2072	1.0	1.4	0.4	0.4	0.3	0.3	0.6	1.0	3.3	2.0	2.6	2.3	1.2	0.9	0.7	**18.5**
2074	1.0	1.4	0.4	0.4	0.4	0.3	0.6	1.1	3.4	2.1	2.7	2.4	1.2	0.9	0.7	**18.9**
2076	1.0	1.5	0.4	0.4	0.4	0.4	0.6	1.1	3.6	2.1	2.8	2.4	1.3	0.9	0.7	**19.6**
2078	1.0	1.6	0.4	0.5	0.4	0.4	0.7	1.2	3.7	2.2	2.9	2.5	1.3	0.9	0.7	**20.3**
2080	1.1	1.6	0.4	0.5	0.4	0.4	0.7	1.2	3.8	2.2	2.9	2.6	1.3	0.9	0.7	**20.8**
2082	1.1	1.7	0.4	0.5	0.4	0.4	0.7	1.2	3.9	2.3	3.0	2.6	1.3	0.9	0.7	**21.2**
2084	1.1	1.7	0.4	0.5	0.4	0.4	0.7	1.3	4.0	2.3	3.1	2.7	1.4	0.9	0.7	**21.6**
2086	1.1	1.7	0.5	0.5	0.4	0.4	0.7	1.3	4.0	2.3	3.1	2.7	1.4	0.9	0.7	**22.0**
2088	1.2	1.8	0.5	0.5	0.4	0.4	0.7	1.3	4.1	2.4	3.2	2.8	1.4	0.9	0.7	**22.3**
2090	1.2	1.8	0.5	0.5	0.4	0.4	0.8	1.4	4.2	2.4	3.2	2.8	1.4	1.0	0.8	**22.7**
2092	1.2	1.8	0.5	0.5	0.5	0.4	0.8	1.4	4.2	2.4	3.3	2.9	1.4	1.0	0.8	**23.0**
2094	1.2	1.9	0.5	0.5	0.5	0.4	0.8	1.4	4.3	2.5	3.3	2.9	1.4	1.0	0.8	**23.3**
2096	1.2	1.9	0.5	0.5	0.5	0.4	0.8	1.4	4.3	2.5	3.4	3.0	1.4	1.0	0.8	**23.6**
2098	1.3	1.9	0.5	0.6	0.5	0.5	0.8	1.4	4.4	2.5	3.4	3.0	1.5	1.0	0.8	**23.9**
2100	1.3	1.9	0.5	0.6	0.5	0.5	0.8	1.5	4.5	2.5	3.4	3.0	1.5	1.0	0.8	**24.1**
2102	1.3	1.9	0.5	0.6	0.5	0.5	0.8	1.5	4.5	2.6	3.5	3.0	1.5	1.0	0.8	**24.3**
2104	1.3	2.0	0.5	0.6	0.5	0.5	0.8	1.5	4.5	2.6	3.5	3.1	1.5	1.0	0.8	**24.6**

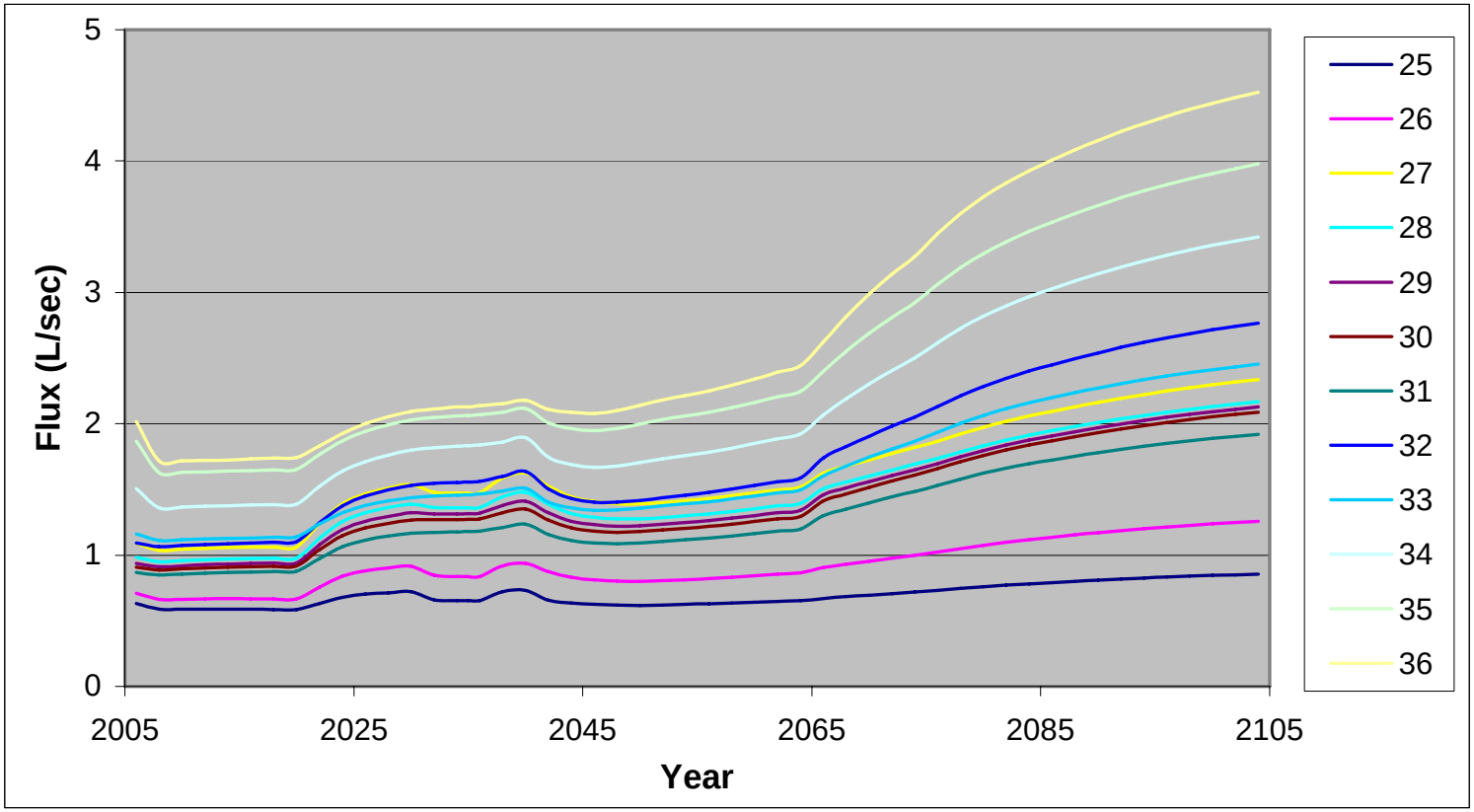
B-1 (S6-11). Predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 1) (Scenario-6)



B-1 (S6-12). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 1) (Scenario-6)

	SIS well #												
Year	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**Total**
2006	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.2	1.5	1.9	2.0	**13.8**
2008	0.6	0.7	1.0	0.9	0.9	0.9	0.8	1.1	1.1	1.4	1.6	1.7	**12.8**
2010	0.6	0.7	1.0	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.6	1.7	**12.8**
2012	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.6	1.7	**12.9**
2014	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.6	1.7	**12.9**
2016	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.6	1.7	**13.0**
2018	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.6	1.7	**13.0**
2020	0.6	0.7	1.1	1.0	0.9	0.9	0.9	1.1	1.1	1.4	1.7	1.7	**13.0**
2022	0.6	0.8	1.2	1.1	1.1	1.0	1.0	1.2	1.2	1.5	1.8	1.8	**14.5**
2024	0.7	0.8	1.4	1.3	1.2	1.1	1.1	1.4	1.3	1.6	1.9	1.9	**15.7**
2026	0.7	0.9	1.5	1.3	1.3	1.2	1.1	1.4	1.4	1.7	1.9	2.0	**16.4**
2028	0.7	0.9	1.5	1.4	1.3	1.2	1.1	1.5	1.4	1.8	2.0	2.1	**16.9**
2030	0.7	0.9	1.5	1.4	1.3	1.3	1.2	1.5	1.4	1.8	2.0	2.1	**17.2**
2032	0.7	0.8	1.5	1.4	1.3	1.3	1.2	1.5	1.5	1.8	2.0	2.1	**17.1**
2034	0.7	0.8	1.5	1.4	1.3	1.3	1.2	1.6	1.5	1.8	2.1	2.1	**17.1**
2035	0.7	0.8	1.5	1.4	1.3	1.3	1.2	1.6	1.5	1.8	2.1	2.1	**17.1**
2036	0.7	0.8	1.5	1.4	1.3	1.3	1.2	1.6	1.5	1.8	2.1	2.1	**17.2**
2038	0.7	0.9	1.6	1.4	1.4	1.3	1.2	1.6	1.5	1.9	2.1	2.2	**17.8**
2040	0.7	0.9	1.6	1.5	1.4	1.4	1.2	1.6	1.5	1.9	2.1	2.2	**18.1**
2042	0.7	0.9	1.5	1.4	1.3	1.3	1.2	1.5	1.4	1.7	2.0	2.1	**17.0**
2044	0.6	0.8	1.4	1.3	1.3	1.2	1.1	1.4	1.4	1.7	2.0	2.1	**16.3**
2046	0.6	0.8	1.4	1.3	1.2	1.2	1.1	1.4	1.3	1.7	1.9	2.1	**16.1**
2048	0.6	0.8	1.4	1.3	1.2	1.2	1.1	1.4	1.3	1.7	2.0	2.1	**16.1**
2050	0.6	0.8	1.4	1.3	1.2	1.2	1.1	1.4	1.4	1.7	2.0	2.1	**16.2**
2052	0.6	0.8	1.4	1.3	1.2	1.2	1.1	1.4	1.4	1.7	2.0	2.2	**16.4**
2054	0.6	0.8	1.4	1.3	1.2	1.2	1.1	1.5	1.4	1.8	2.1	2.2	**16.6**
2056	0.6	0.8	1.4	1.3	1.3	1.2	1.1	1.5	1.4	1.8	2.1	2.3	**16.8**
2058	0.6	0.8	1.5	1.3	1.3	1.2	1.1	1.5	1.4	1.8	2.1	2.3	**17.1**
2060	0.6	0.8	1.5	1.4	1.3	1.3	1.2	1.5	1.5	1.9	2.2	2.3	**17.4**
2062	0.6	0.9	1.5	1.4	1.3	1.3	1.2	1.6	1.5	1.9	2.2	2.4	**17.7**
2064	0.7	0.9	1.5	1.4	1.3	1.3	1.2	1.6	1.5	1.9	2.2	2.4	**18.0**
2066	0.7	0.9	1.6	1.5	1.5	1.4	1.3	1.7	1.6	2.1	2.4	2.6	**19.3**
2068	0.7	0.9	1.7	1.6	1.5	1.5	1.4	1.8	1.7	2.2	2.6	2.8	**20.2**
2070	0.7	1.0	1.7	1.6	1.6	1.5	1.4	1.9	1.7	2.3	2.7	3.0	**21.1**
2072	0.7	1.0	1.8	1.6	1.6	1.6	1.4	2.0	1.8	2.4	2.8	3.1	**21.9**
2074	0.7	1.0	1.8	1.7	1.7	1.6	1.5	2.1	1.9	2.5	2.9	3.3	**22.6**
2076	0.7	1.0	1.9	1.7	1.7	1.7	1.5	2.1	1.9	2.6	3.1	3.4	**23.4**
2078	0.7	1.0	1.9	1.8	1.7	1.7	1.6	2.2	2.0	2.7	3.2	3.6	**24.3**
2080	0.8	1.1	2.0	1.8	1.8	1.8	1.6	2.3	2.1	2.8	3.3	3.7	**25.0**
2082	0.8	1.1	2.0	1.9	1.8	1.8	1.7	2.3	2.1	2.9	3.4	3.8	**25.6**
2084	0.8	1.1	2.1	1.9	1.9	1.8	1.7	2.4	2.2	3.0	3.5	3.9	**26.2**
2086	0.8	1.1	2.1	1.9	1.9	1.9	1.7	2.4	2.2	3.0	3.5	4.0	**26.7**
2088	0.8	1.2	2.1	2.0	1.9	1.9	1.8	2.5	2.2	3.1	3.6	4.1	**27.2**
2090	0.8	1.2	2.2	2.0	2.0	1.9	1.8	2.5	2.3	3.1	3.7	4.2	**27.6**
2092	0.8	1.2	2.2	2.0	2.0	2.0	1.8	2.6	2.3	3.2	3.7	4.2	**28.0**
2094	0.8	1.2	2.2	2.1	2.0	2.0	1.8	2.6	2.3	3.2	3.8	4.3	**28.4**
2096	0.8	1.2	2.2	2.1	2.0	2.0	1.9	2.7	2.4	3.3	3.8	4.3	**28.8**
2098	0.8	1.2	2.3	2.1	2.1	2.0	1.9	2.7	2.4	3.3	3.9	4.4	**29.1**
2100	0.8	1.2	2.3	2.1	2.1	2.1	1.9	2.7	2.4	3.4	3.9	4.4	**29.4**
2102	0.9	1.2	2.3	2.1	2.1	2.1	1.9	2.7	2.4	3.4	3.9	4.5	**29.6**
2104	0.9	1.3	2.3	2.2	2.1	2.1	1.9	2.8	2.5	3.4	4.0	4.5	**29.9**

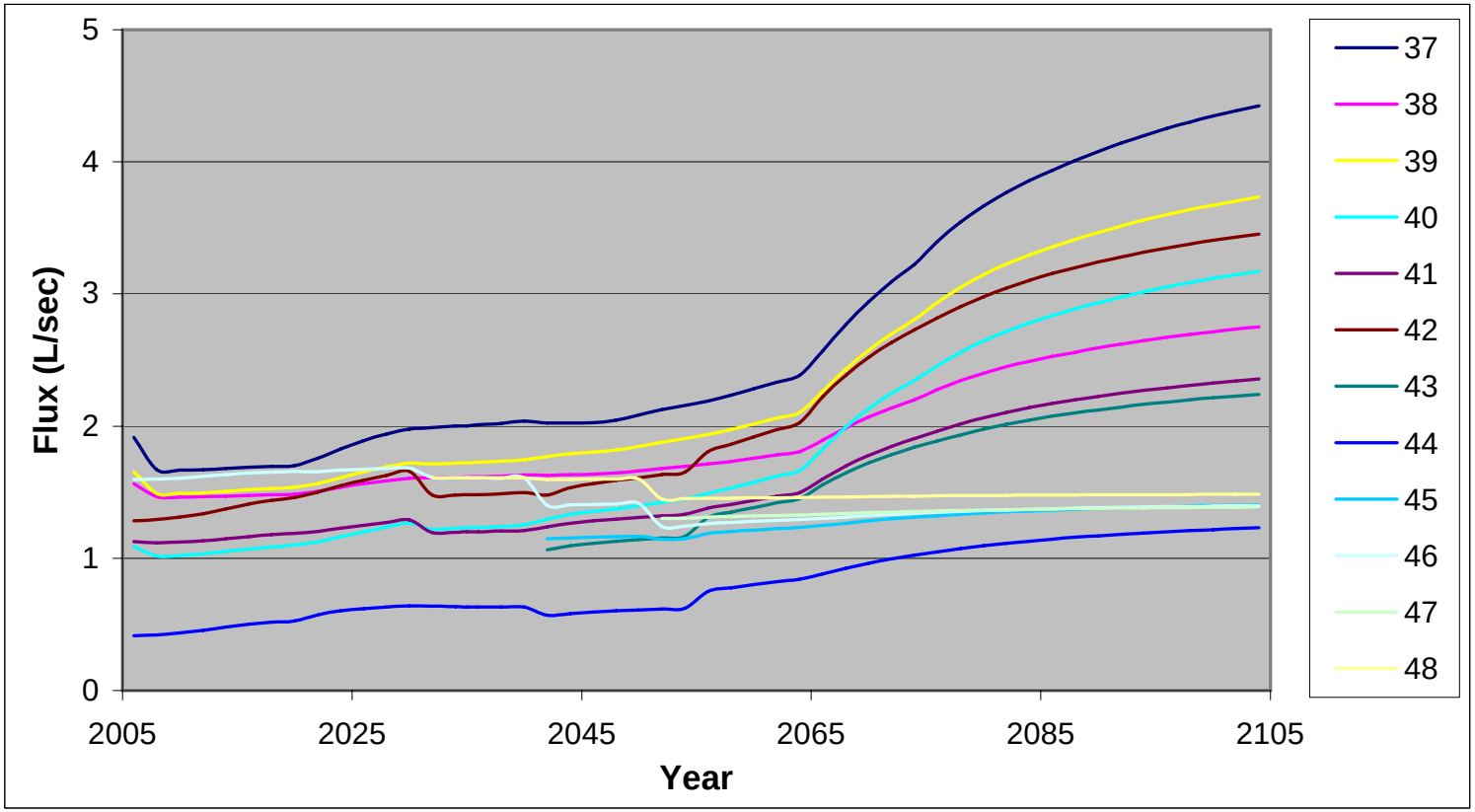
B-1 (S6-13). Predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 2) (Scenario-6)



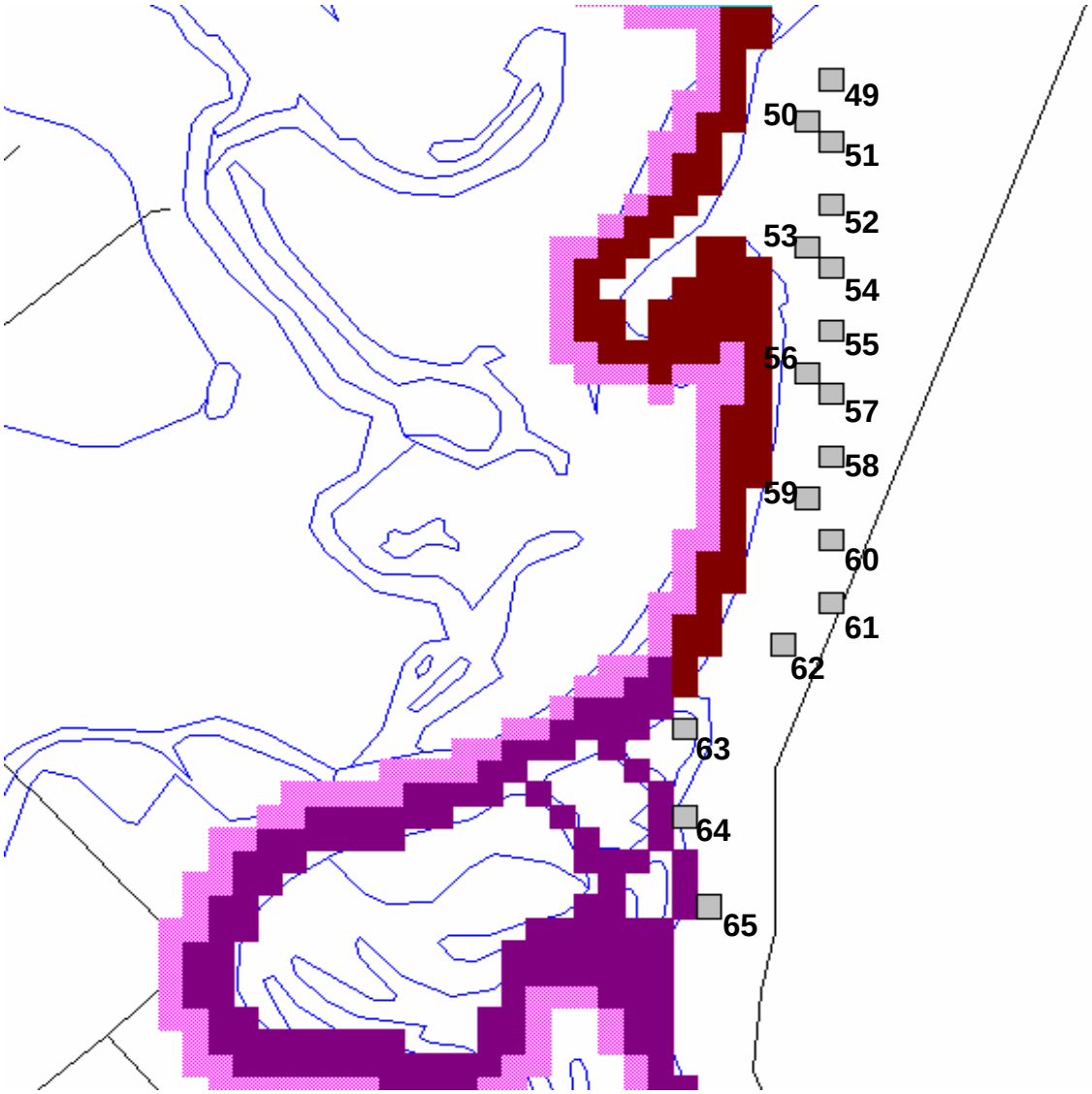
B-1 (S6-14). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 2) (Scenario-6)

	SIS well #												
Year	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**Total**
2006	1.9	1.6	1.7	1.1	1.1	1.3		0.4		1.6			**10.7**
2008	1.7	1.5	1.5	1.0	1.1	1.3		0.4		1.6			**10.1**
2010	1.7	1.5	1.5	1.0	1.1	1.3		0.4		1.6			**10.1**
2012	1.7	1.5	1.5	1.0	1.1	1.3		0.5		1.6			**10.2**
2014	1.7	1.5	1.5	1.1	1.1	1.4		0.5		1.6			**10.3**
2016	1.7	1.5	1.5	1.1	1.2	1.4		0.5		1.6			**10.5**
2018	1.7	1.5	1.5	1.1	1.2	1.4		0.5		1.7			**10.6**
2020	1.7	1.5	1.5	1.1	1.2	1.5		0.5		1.7			**10.7**
2022	1.8	1.5	1.6	1.1	1.2	1.5		0.6		1.7			**10.9**
2024	1.8	1.5	1.6	1.2	1.2	1.5		0.6		1.7			**11.2**
2026	1.9	1.6	1.7	1.2	1.3	1.6		0.6		1.7			**11.4**
2028	1.9	1.6	1.7	1.2	1.3	1.6		0.6		1.7			**11.7**
2030	2.0	1.6	1.7	1.3	1.3	1.7		0.6		1.7			**11.8**
2032	2.0	1.6	1.7	1.2	1.2	1.5		0.6		1.6		1.6	**13.1**
2034	2.0	1.6	1.7	1.2	1.2	1.5		0.6		1.6		1.6	**13.1**
2035	2.0	1.6	1.7	1.2	1.2	1.5		0.6		1.6		1.6	**13.1**
2036	2.0	1.6	1.7	1.2	1.2	1.5		0.6		1.6		1.6	**13.1**
2038	2.0	1.6	1.7	1.2	1.2	1.5		0.6		1.6		1.6	**13.2**
2040	2.0	1.6	1.7	1.3	1.2	1.5		0.6		1.6		1.6	**13.2**
2042	2.0	1.6	1.8	1.3	1.2	1.5	1.1	0.6	1.1	1.4		1.6	**15.2**
2044	2.0	1.6	1.8	1.3	1.3	1.5	1.1	0.6	1.2	1.4		1.6	**15.4**
2046	2.0	1.6	1.8	1.4	1.3	1.6	1.1	0.6	1.2	1.4		1.6	**15.5**
2048	2.0	1.6	1.8	1.4	1.3	1.6	1.1	0.6	1.2	1.4		1.6	**15.7**
2050	2.1	1.7	1.8	1.4	1.3	1.6	1.1	0.6	1.2	1.4		1.6	**15.8**
2052	2.1	1.7	1.9	1.4	1.3	1.6	1.2	0.6	1.1	1.2	1.3	1.4	**17.0**
2054	2.2	1.7	1.9	1.4	1.3	1.7	1.2	0.6	1.1	1.2	1.3	1.5	**17.1**
2056	2.2	1.7	1.9	1.5	1.4	1.8	1.3	0.7	1.2	1.3	1.3	1.5	**17.8**
2058	2.2	1.7	2.0	1.5	1.4	1.9	1.3	0.8	1.2	1.3	1.3	1.5	**18.1**
2060	2.3	1.8	2.0	1.6	1.4	1.9	1.4	0.8	1.2	1.3	1.3	1.5	**18.4**
2062	2.3	1.8	2.1	1.6	1.5	2.0	1.4	0.8	1.2	1.3	1.3	1.5	**18.8**
2064	2.4	1.8	2.1	1.7	1.5	2.0	1.5	0.8	1.2	1.3	1.3	1.5	**19.1**
2066	2.6	1.9	2.3	1.8	1.6	2.2	1.6	0.9	1.2	1.3	1.3	1.5	**20.1**
2068	2.8	2.0	2.4	2.0	1.7	2.4	1.6	0.9	1.3	1.3	1.3	1.5	**21.2**
2070	2.9	2.1	2.6	2.1	1.8	2.5	1.7	1.0	1.3	1.3	1.3	1.5	**22.1**
2072	3.1	2.1	2.7	2.2	1.8	2.6	1.8	1.0	1.3	1.3	1.3	1.5	**22.9**
2074	3.2	2.2	2.8	2.3	1.9	2.7	1.8	1.0	1.3	1.3	1.4	1.5	**23.6**
2076	3.4	2.3	2.9	2.5	2.0	2.8	1.9	1.0	1.3	1.3	1.4	1.5	**24.3**
2078	3.5	2.3	3.1	2.6	2.0	2.9	1.9	1.1	1.3	1.4	1.4	1.5	**25.0**
2080	3.7	2.4	3.1	2.6	2.1	3.0	2.0	1.1	1.3	1.4	1.4	1.5	**25.5**
2082	3.8	2.4	3.2	2.7	2.1	3.0	2.0	1.1	1.4	1.4	1.4	1.5	**26.0**
2084	3.9	2.5	3.3	2.8	2.1	3.1	2.0	1.1	1.4	1.4	1.4	1.5	**26.4**
2086	3.9	2.5	3.4	2.8	2.2	3.2	2.1	1.1	1.4	1.4	1.4	1.5	**26.8**
2088	4.0	2.6	3.4	2.9	2.2	3.2	2.1	1.2	1.4	1.4	1.4	1.5	**27.1**
2090	4.1	2.6	3.5	2.9	2.2	3.2	2.1	1.2	1.4	1.4	1.4	1.5	**27.5**
2092	4.1	2.6	3.5	3.0	2.2	3.3	2.1	1.2	1.4	1.4	1.4	1.5	**27.7**
2094	4.2	2.6	3.6	3.0	2.3	3.3	2.2	1.2	1.4	1.4	1.4	1.5	**28.0**
2096	4.3	2.7	3.6	3.1	2.3	3.3	2.2	1.2	1.4	1.4	1.4	1.5	**28.3**
2098	4.3	2.7	3.6	3.1	2.3	3.4	2.2	1.2	1.4	1.4	1.4	1.5	**28.5**
2100	4.3	2.7	3.7	3.1	2.3	3.4	2.2	1.2	1.4	1.4	1.4	1.5	**28.7**
2102	4.4	2.7	3.7	3.1	2.3	3.4	2.2	1.2	1.4	1.4	1.4	1.5	**28.9**
2104	4.4	2.8	3.7	3.2	2.4	3.5	2.2	1.2	1.4	1.4	1.4	1.5	**29.0**

B-1 (S6-15). Predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 3) (Scenario-6)



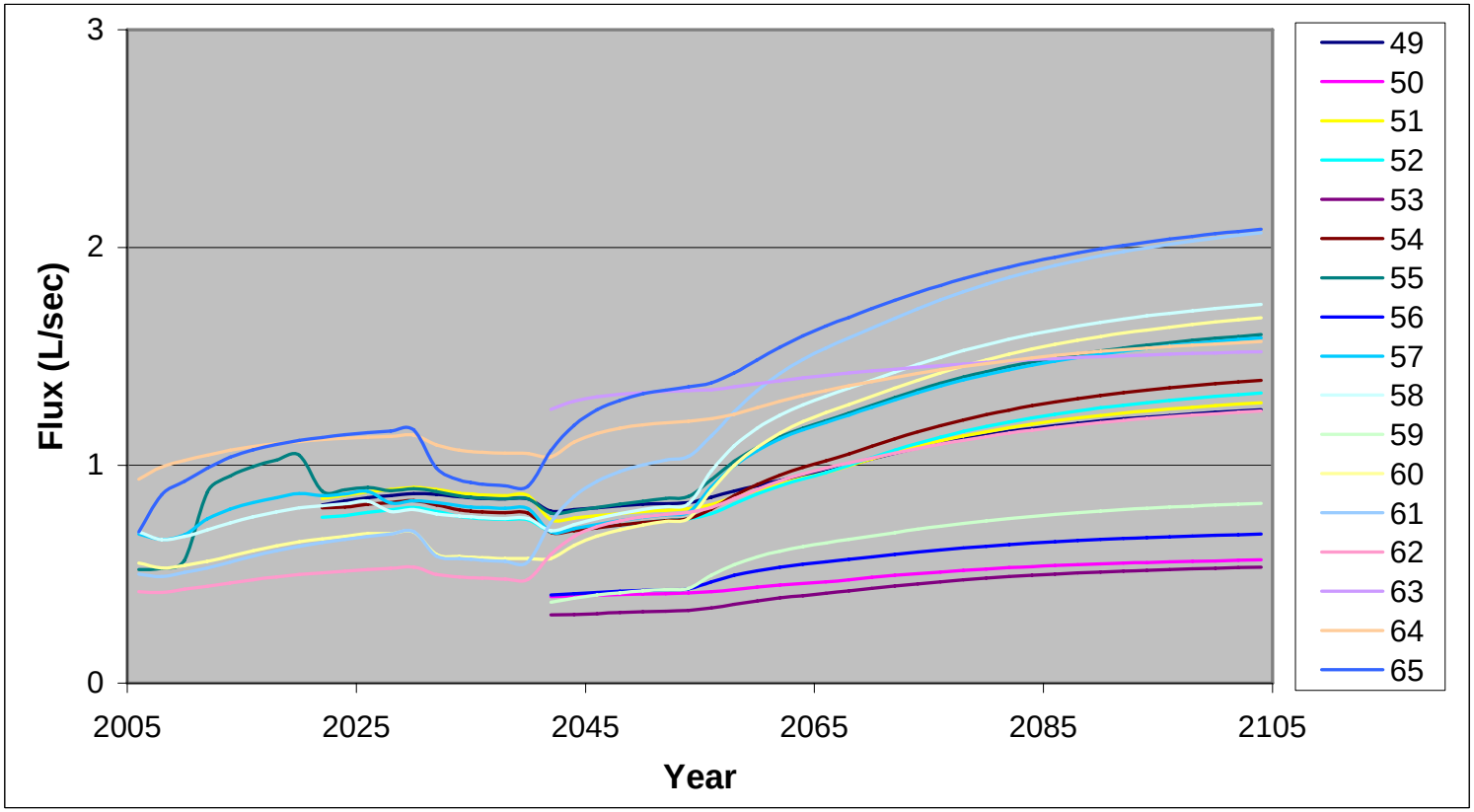
B-1 (S6-16). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Central Murtho Area (Group 3) (Scenario-6)



B-1 (S6-17). Murtho concept SIS wells in the South Murtho Area (Scenario-6)

	SIS well #																	
Year	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**Total**
2006							0.5		0.7	0.7		0.6	0.5	0.4		0.9	0.7	**5.0**
2008							0.5		0.7	0.7		0.5	0.5	0.4		1.0	0.9	**5.1**
2010							0.6		0.7	0.7		0.5	0.5	0.4		1.0	0.9	**5.3**
2012							0.9		0.8	0.7		0.6	0.5	0.4		1.0	1.0	**5.9**
2014							1.0		0.8	0.7		0.6	0.6	0.5		1.1	1.0	**6.2**
2016							1.0		0.8	0.8		0.6	0.6	0.5		1.1	1.1	**6.4**
2018							1.0		0.9	0.8		0.6	0.6	0.5		1.1	1.1	**6.6**
2020							1.0		0.9	0.8		0.6	0.6	0.5		1.1	1.1	**6.7**
2022	0.8		0.8	0.8		0.8	0.9		0.9	0.8		0.7	0.6	0.5		1.1	1.1	**9.9**
2024	0.8		0.9	0.8		0.8	0.9		0.9	0.8		0.7	0.7	0.5		1.1	1.1	**10.0**
2026	0.9		0.9	0.8		0.8	0.9		0.9	0.8		0.7	0.7	0.5		1.1	1.1	**10.1**
2028	0.9		0.9	0.8		0.8	0.9		0.8	0.8		0.7	0.7	0.5		1.1	1.2	**10.1**
2030	0.9		0.9	0.8		0.8	0.9		0.8	0.8		0.7	0.7	0.5		1.1	1.2	**10.2**
2032	0.9		0.9	0.8		0.8	0.9		0.8	0.8		0.6	0.6	0.5		1.1	1.0	**9.6**
2034	0.9		0.9	0.8		0.8	0.9		0.8	0.8		0.6	0.6	0.5		1.1	0.9	**9.4**
2035	0.9		0.9	0.8		0.8	0.9		0.8	0.8		0.6	0.6	0.5		1.1	0.9	**9.3**
2036	0.8		0.9	0.8		0.8	0.9		0.8	0.8		0.6	0.6	0.5		1.1	0.9	**9.3**
2038	0.8		0.9	0.8		0.8	0.8		0.8	0.8		0.6	0.6	0.5		1.1	0.9	**9.2**
2040	0.8		0.9	0.8		0.8	0.8		0.8	0.8		0.6	0.6	0.5		1.1	0.9	**9.2**
2042	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.7	0.7	0.4	0.6	0.7	0.6	1.3	1.0	1.1	**11.9**
2044	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.7	0.7	0.4	0.6	0.9	0.7	1.3	1.1	1.2	**12.5**
2046	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.7	0.8	0.4	0.7	0.9	0.7	1.3	1.1	1.3	**12.9**
2048	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.7	0.8	0.4	0.7	1.0	0.7	1.3	1.2	1.3	**13.2**
2050	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.8	0.8	0.4	0.7	1.0	0.8	1.3	1.2	1.3	**13.4**
2052	0.8	0.4	0.8	0.7	0.3	0.7	0.8	0.4	0.8	0.8	0.4	0.7	1.0	0.8	1.3	1.2	1.3	**13.6**
2054	0.8	0.4	0.8	0.8	0.3	0.8	0.9	0.4	0.8	0.8	0.4	0.8	1.0	0.8	1.3	1.2	1.4	**13.7**
2056	0.9	0.4	0.8	0.8	0.3	0.8	0.9	0.5	0.9	1.0	0.5	0.9	1.1	0.8	1.3	1.2	1.4	**14.5**
2058	0.9	0.4	0.9	0.8	0.4	0.9	1.0	0.5	1.0	1.1	0.5	1.0	1.2	0.8	1.4	1.2	1.4	**15.5**
2060	0.9	0.4	0.9	0.9	0.4	0.9	1.1	0.5	1.1	1.2	0.6	1.1	1.3	0.9	1.4	1.3	1.5	**16.2**
2062	0.9	0.4	0.9	0.9	0.4	1.0	1.1	0.5	1.1	1.2	0.6	1.1	1.4	0.9	1.4	1.3	1.5	**16.9**
2064	1.0	0.5	0.9	0.9	0.4	1.0	1.2	0.5	1.2	1.3	0.6	1.2	1.5	1.0	1.4	1.3	1.6	**17.4**
2066	1.0	0.5	1.0	1.0	0.4	1.0	1.2	0.6	1.2	1.3	0.6	1.2	1.5	1.0	1.4	1.3	1.6	**17.9**
2068	1.0	0.5	1.0	1.0	0.4	1.1	1.2	0.6	1.2	1.4	0.7	1.3	1.6	1.0	1.4	1.4	1.7	**18.3**
2070	1.0	0.5	1.0	1.0	0.4	1.1	1.3	0.6	1.3	1.4	0.7	1.3	1.6	1.0	1.4	1.4	1.7	**18.8**
2072	1.1	0.5	1.1	1.1	0.4	1.1	1.3	0.6	1.3	1.4	0.7	1.4	1.7	1.1	1.4	1.4	1.8	**19.3**
2074	1.1	0.5	1.1	1.1	0.5	1.2	1.3	0.6	1.3	1.5	0.7	1.4	1.7	1.1	1.5	1.4	1.8	**19.7**
2076	1.1	0.5	1.1	1.1	0.5	1.2	1.4	0.6	1.4	1.5	0.7	1.4	1.8	1.1	1.5	1.4	1.8	**20.1**
2078	1.1	0.5	1.1	1.2	0.5	1.2	1.4	0.6	1.4	1.5	0.7	1.5	1.8	1.1	1.5	1.5	1.9	**20.4**
2080	1.1	0.5	1.2	1.2	0.5	1.2	1.4	0.6	1.4	1.6	0.7	1.5	1.8	1.1	1.5	1.5	1.9	**20.8**
2082	1.2	0.5	1.2	1.2	0.5	1.3	1.5	0.6	1.4	1.6	0.8	1.5	1.9	1.1	1.5	1.5	1.9	**21.1**
2084	1.2	0.5	1.2	1.2	0.5	1.3	1.5	0.6	1.5	1.6	0.8	1.5	1.9	1.2	1.5	1.5	1.9	**21.3**
2086	1.2	0.5	1.2	1.2	0.5	1.3	1.5	0.6	1.5	1.6	0.8	1.6	1.9	1.2	1.5	1.5	2.0	**21.6**
2088	1.2	0.5	1.2	1.3	0.5	1.3	1.5	0.7	1.5	1.6	0.8	1.6	1.9	1.2	1.5	1.5	2.0	**21.8**
2090	1.2	0.5	1.2	1.3	0.5	1.3	1.5	0.7	1.5	1.7	0.8	1.6	2.0	1.2	1.5	1.5	2.0	**22.0**
2092	1.2	0.6	1.2	1.3	0.5	1.3	1.5	0.7	1.5	1.7	0.8	1.6	2.0	1.2	1.5	1.5	2.0	**22.2**
2094	1.2	0.6	1.2	1.3	0.5	1.3	1.6	0.7	1.5	1.7	0.8	1.6	2.0	1.2	1.5	1.5	2.0	**22.3**
2096	1.2	0.6	1.3	1.3	0.5	1.4	1.6	0.7	1.5	1.7	0.8	1.6	2.0	1.2	1.5	1.5	2.0	**22.5**
2098	1.2	0.6	1.3	1.3	0.5	1.4	1.6	0.7	1.6	1.7	0.8	1.6	2.0	1.2	1.5	1.6	2.1	**22.6**
2100	1.2	0.6	1.3	1.3	0.5	1.4	1.6	0.7	1.6	1.7	0.8	1.7	2.0	1.2	1.5	1.6	2.1	**22.7**
2102	1.2	0.6	1.3	1.3	0.5	1.4	1.6	0.7	1.6	1.7	0.8	1.7	2.1	1.2	1.5	1.6	2.1	**22.9**
2104	1.3	0.6	1.3	1.3	0.5	1.4	1.6	0.7	1.6	1.7	0.8	1.7	2.1	1.2	1.5	1.6	2.1	**23.0**

B-1 (S6-18). Predicted range of pumping rates (Litres/second) for SIS wells in the South Murtho Area (Scenario-6)



B-1 (S6-19). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the South Murtho Area (Scenario-6)

B-2. MODEL OUTPUT – PIKE AREA

- Summary of annual salt loads
- Flow budget zones
- Modelled groundwater flux (m^3/day)
- Modelled Salt load (tonnes/day)

(All Scenarios)

- SIS well locations and predicted pumping rates (L/sec)

(Scenario-6 only)

Scenario	Name	Model Run	Irrigation development area	IIP[1]	RH[2]	SIS[3]
S–1	Natural system	Steady State	None	–	–	–
S–2	Mallee clearance	1920 – 2105	None (but includes Mallee clearance area)	–	–	–
S–3A	Pre-1988, no IIP, no RH	1988 – 2105	Pre-1988	No	No	–
S–3B	Pre-1988, with IIP, no RH	1988 – 2105	Pre-1988	Yes	No	–
S–3C	Pre-1988, with IIP and with RH	1988 – 2105	Pre-1988	Yes	Yes	–
S–4	Current irrigation	2005 – 2105	Pre-1988 + Post-1988	Yes	Yes	No
S–5	Current plus future irrigation	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	No
S–6	SIS	2005 – 2105	Pre-1988 + Post-1988 + Future development	Yes	Yes	Yes

1 Improved Irrigation Practices 2 Rehabilitation 3 Salt Interception Scheme

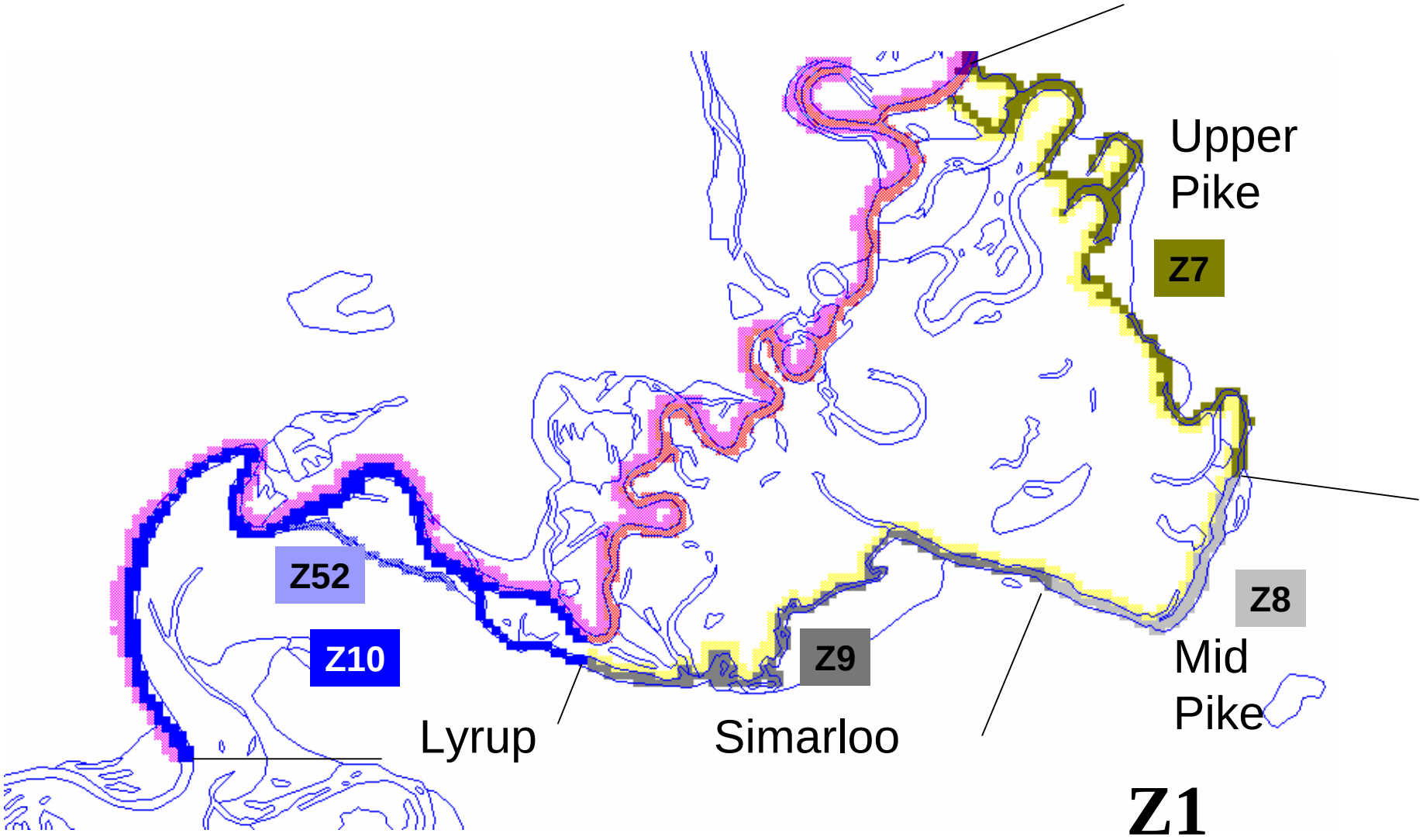
B-2. Model Scenario conditions

Time	S-1	S-2	S-3A	S-3B	S-3C	S-4	S-5	S-6
1988	63.5	65.8	149.7	149.7	149.7	149.7	149.7	149.7
1989	63.5	65.8	151.0	151.0	151.0	151.0	151.0	151.0
1990	63.5	65.9	152.4	152.4	152.4	152.4	152.4	152.4
1991	63.5	66.1	155.0	155.0	155.0	155.0	155.0	155.0
1992	63.5	66.2	157.7	157.7	157.7	157.7	157.7	157.7
1993	63.5	66.3	159.7	159.7	159.7	159.6	159.6	159.6
1994	63.5	66.4	161.6	161.6	161.6	161.6	161.6	161.6
1995	63.5	66.5	161.5	161.5	161.5	163.9	163.9	163.9
1996	63.5	66.6	161.3	161.3	161.3	166.3	166.3	166.3
1997	63.5	66.7	160.9	160.8	160.8	166.4	166.4	166.4
1998	63.5	66.8	160.4	160.2	160.2	166.5	166.5	166.5
1999	63.5	66.9	160.7	160.2	160.2	166.8	166.8	166.8
2000	63.5	67.0	160.9	160.3	160.3	167.1	167.1	167.1
2001	63.5	67.2	162.2	156.0	156.0	162.5	162.5	162.5
2002	63.5	67.4	163.6	151.8	151.8	157.9	157.9	157.9
2003	63.5	67.5	164.3	151.0	151.0	157.1	157.1	157.1
2004	63.5	67.6	165.0	150.2	150.2	156.3	156.3	156.3
2005	63.5	67.9	165.6	149.8	149.8	156.0	156.0	156.0
2006	63.5	68.1	168.8	151.2	151.2	157.4	157.4	79.0
2007	63.5	68.2	171.6	152.1	152.1	158.0	158.0	75.1
2008	63.5	68.3	174.4	153.1	153.1	158.6	158.6	71.1
2009	63.5	68.5	176.3	154.1	154.1	159.6	159.6	70.5
2010	63.5	68.7	178.2	155.1	155.1	160.5	160.5	70.0
2011	63.5	68.8	183.1	158.1	158.1	163.6	163.6	71.1
2012	63.5	69.0	188.0	161.1	161.1	166.6	166.6	72.1
2013	63.5	69.1	190.6	162.6	162.6	168.1	168.1	72.6
2014	63.5	69.2	193.3	164.0	164.0	169.6	169.6	73.2
2015	63.5	69.4	195.0	164.9	164.9	170.6	170.6	73.5
2016	63.5	69.5	196.8	165.8	165.8	171.7	171.7	73.8
2017	63.5	69.6	198.1	166.2	166.2	172.9	172.9	74.2
2018	63.5	69.8	199.4	166.5	166.5	174.1	174.1	74.6
2019	63.5	70.0	200.6	167.1	167.1	175.4	175.4	75.0
2020	63.5	70.2	201.8	167.7	167.7	176.7	176.7	75.5
2021	63.5	70.3	203.7	166.8	166.8	177.2	177.3	72.6
2022	63.5	70.5	205.7	165.8	165.8	177.7	177.8	69.8
2023	63.5	70.7	207.4	165.9	165.9	178.6	178.6	70.0
2024	63.5	70.8	209.1	165.9	165.9	179.4	179.5	70.3
2025	63.5	70.9	210.3	164.7	164.7	178.9	179.0	70.0
2026	63.5	71.1	211.6	163.6	163.6	178.4	178.5	69.6
2027	63.5	71.2	212.6	163.2	163.2	178.4	178.5	69.6
2028	63.5	71.4	213.6	162.7	162.7	178.5	178.6	69.6
2029	63.5	71.6	214.4	162.7	162.7	179.2	179.3	69.9
2030	63.5	71.8	215.3	162.8	162.8	179.8	180.0	70.1
2031	63.5	72.0	216.1	159.8	159.8	177.5	177.6	68.7
2032	63.5	72.2	216.9	156.8	156.8	175.1	175.2	67.3
2033	63.5	72.4	217.6	155.6	155.6	174.3	174.5	67.0
2034	63.5	72.5	218.3	154.4	154.4	173.6	173.7	66.7
2035	63.5	72.7	218.9	153.8	153.8	173.4	174.2	64.2
2036	63.5	72.8	219.6	153.3	153.3	173.2	174.6	61.6
2037	63.5	73.0	220.2	153.0	153.0	173.2	175.4	61.8
2038	63.5	73.1	220.8	152.7	152.7	173.2	176.1	62.1
2039	63.5	73.4	221.3	152.6	152.6	173.2	176.7	62.3
2040	63.5	73.7	221.9	152.5	152.5	173.3	177.2	62.5
2041	63.5	73.9	222.4	152.4	152.4	173.9	178.1	61.3
2042	63.5	74.1	222.9	152.4	152.4	174.4	179.0	60.1
2043	63.5	74.2	223.4	152.4	152.4	175.7	180.5	60.6
2044	63.5	74.4	223.9	152.4	152.4	177.0	182.0	61.0
2045	63.5	74.6	224.3	152.4	152.4	177.9	183.1	61.4
2046	63.5	74.8	224.8	152.4	152.4	178.7	184.2	61.8

B-2. Predicted annual salt load for all scenarios (Pike area)

Time	S-1	S-2	S-3A	S-3B	S-3C	S-4	S-5	S-6
2047	63.5	74.9	225.2	152.5	152.5	179.4	185.3	62.2
2048	63.5	75.1	225.6	152.5	152.5	180.1	186.4	62.5
2049	63.5	75.4	226.0	152.6	152.6	180.7	187.6	63.0
2050	63.5	75.7	226.4	152.6	152.6	181.2	188.9	63.4
2051	63.5	75.9	226.8	152.7	152.7	181.7	190.2	60.6
2052	63.5	76.1	227.1	152.8	152.8	182.2	191.4	57.9
2053	63.5	76.3	227.5	152.8	152.8	182.6	192.7	58.2
2054	63.5	76.5	227.8	152.9	152.9	183.0	193.9	58.5
2055	63.5	76.7	228.2	153.0	153.0	183.4	195.4	58.9
2056	63.5	76.9	228.5	153.1	153.1	183.7	197.0	59.3
2057	63.5	77.1	228.8	153.1	153.1	184.1	198.7	59.8
2058	63.5	77.2	229.1	153.2	153.2	184.4	200.5	60.2
2059	63.5	77.6	229.4	153.3	153.3	184.7	202.2	60.7
2060	63.5	77.9	229.7	153.4	153.4	185.0	204.0	61.2
2061	63.5	78.1	230.0	153.5	153.5	185.3	205.7	61.7
2062	63.5	78.3	230.3	153.5	153.5	185.6	207.4	62.2
2063	63.5	78.5	230.5	153.6	153.6	185.8	208.9	62.7
2064	63.5	78.7	230.8	153.7	153.7	186.1	210.4	63.1
2065	63.5	78.9	231.0	153.8	153.8	186.3	211.9	63.6
2066	63.5	79.1	231.3	153.8	153.8	186.6	213.4	64.0
2067	63.5	79.3	231.5	153.9	153.9	186.8	214.9	64.5
2068	63.5	79.5	231.8	154.0	154.0	187.0	216.4	64.9
2069	63.5	79.9	232.0	154.1	154.1	187.3	217.9	65.3
2070	63.5	80.2	232.2	154.1	154.1	187.5	219.3	65.7
2071	63.5	80.4	232.4	154.2	154.2	187.7	220.7	66.1
2072	63.5	80.7	232.7	154.3	154.3	187.9	222.1	66.5
2073	63.5	80.9	232.9	154.4	154.4	188.1	223.4	66.9
2074	63.5	81.1	233.1	154.4	154.4	188.3	224.6	67.3
2075	63.5	81.3	233.3	154.5	154.5	188.5	225.9	67.7
2076	63.5	81.5	233.5	154.6	154.6	188.7	227.1	68.0
2077	63.5	81.7	233.7	154.6	154.6	188.8	228.2	68.4
2078	63.5	81.9	233.9	154.7	154.7	189.0	229.4	68.7
2079	63.5	82.2	234.0	154.8	154.8	189.2	230.5	69.1
2080	63.5	82.6	234.2	154.8	154.8	189.4	231.6	69.4
2081	63.5	82.8	234.4	154.9	154.9	189.5	232.6	69.7
2082	63.5	83.1	234.6	155.0	155.0	189.7	233.6	70.0
2083	63.5	83.3	234.7	155.0	155.0	189.9	234.6	70.3
2084	63.5	83.5	234.9	155.1	155.1	190.0	235.6	70.6
2085	63.5	83.7	235.1	155.1	155.1	190.2	236.5	70.9
2086	63.5	83.9	235.2	155.2	155.2	190.3	237.4	71.1
2087	63.5	84.2	235.4	155.3	155.3	190.5	238.3	71.4
2088	63.5	84.4	235.5	155.3	155.3	190.6	239.2	71.6
2089	63.5	84.7	235.7	155.4	155.4	190.8	240.0	71.9
2090	63.5	85.0	235.8	155.4	155.4	190.9	240.9	72.1
2091	63.5	85.2	236.0	155.5	155.5	191.1	241.7	72.4
2092	63.5	85.5	236.1	155.5	155.5	191.2	242.4	72.6
2093	63.5	85.7	236.2	155.6	155.6	191.3	243.2	72.8
2094	63.5	85.9	236.4	155.7	155.7	191.5	243.9	73.0
2095	63.5	86.1	236.5	155.7	155.7	191.6	244.6	73.2
2096	63.5	86.4	236.6	155.8	155.8	191.7	245.3	73.5
2097	63.5	86.6	236.7	155.8	155.8	191.9	246.0	73.7
2098	63.5	86.8	236.9	155.9	155.9	192.0	246.7	73.8
2099	63.5	87.1	237.0	155.9	155.9	192.1	247.3	74.0
2100	63.5	87.4	237.1	156.0	156.0	192.3	247.9	74.2
2101	63.5	87.6	237.2	156.0	156.0	192.4	248.5	74.4
2102	63.5	87.9	237.4	156.1	156.1	192.5	249.1	74.6
2103	63.5	88.1	237.5	156.1	156.1	192.6	249.7	74.7
2104	63.5	88.3	237.6	156.1	156.1	192.7	250.3	74.9
2105	63.5	88.3	237.6	156.1	156.1	192.7	250.3	74.9

B-2. Predicted annual salt load for all scenarios (Pike area)



B-2. Model flow budget zones in the Pike Area (layer 1)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
3650	1930	1167.6	545.72	379.13	2092	99.289	0	99	2192
7300	1940	1167.6	546.15	380.8	2095	103.33	0	103	2198
10950	1950	1169.2	548.48	382.87	2101	106.81	0	107	2207
14600	1960	1171	552.7	386.06	2110	110.21	0	110	2220
18250	1970	1172.7	558.78	390.45	2122	113.67	0	114	2236
21900	1980	1175.8	566.93	397.02	2140	117.89	0	118	2258
24820	1988	1180.4	575.55	405.31	2161	122.5	0	123	2284
25550	1990	1181.1	577.49	407.51	2166	123.34	0	123	2289
26280	1992	1183.8	580.28	410.39	2174	125.55	0	126	2300
27010	1994	1184.9	582.88	413.28	2181	127.13	0	127	2308
27740	1996	1186	585.42	416.35	2188	128.45	0	128	2316
28470	1998	1186.9	587.87	419.52	2194	129.59	0	130	2324
29200	2000	1187.8	590.2	422.69	2201	130.61	0	131	2331
29930	2002	1190.5	593.47	426.46	2210	133.7	0	134	2344
30660	2004	1191.8	596.3	430.23	2218	135.66	0	136	2354
31390	2006	1193.1	599.02	434.1	2226	137.22	0	137	2363
32120	2008	1194.2	601.64	438	2234	138.55	0	139	2372
32850	2010	1195.3	604.15	441.88	2241	139.72	0	140	2381
33580	2012	1198.1	607.97	446.46	2253	143.36	0	143	2396
34310	2014	1199.7	610.95	450.95	2262	145.57	0	146	2407
35040	2016	1201.1	613.77	455.41	2270	147.3	0	147	2418
35770	2018	1202.4	616.48	459.84	2279	148.75	0	149	2427
36500	2020	1203.6	619.09	464.19	2287	150.02	0	150	2437
37230	2022	1207.1	623.56	469.56	2300	153.74	0	154	2454
37960	2024	1209.1	626.74	474.61	2310	156.02	0	156	2466
38690	2026	1210.8	629.68	479.49	2320	157.77	0	158	2478
39420	2028	1212.4	632.49	484.25	2329	159.26	0	159	2488
40150	2030	1214	635.22	488.88	2338	160.56	0	161	2499
40880	2032	1218.4	640.34	494.91	2354	163.8	0	164	2517
41610	2034	1221.1	643.78	500.35	2365	165.95	0	166	2531
42340	2036	1223.3	646.9	505.49	2376	167.67	0	168	2543
43070	2038	1225.5	649.89	510.46	2386	169.16	0	169	2555
43800	2040	1227.6	652.79	515.27	2396	170.5	0	171	2566
44530	2042	1233.3	658.41	521.7	2413	173.17	0	173	2587
45260	2044	1236.8	662.13	527.34	2426	175.17	0	175	2601

B-2 (S2-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-2 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
45990	2046	1239.9	665.47	532.63	2438	176.89	0	177	2615
46720	2048	1242.8	668.65	537.71	2449	178.41	0	178	2628
47450	2050	1245.6	671.73	542.62	2460	179.8	0	180	2640
48180	2052	1252.5	677.64	549.23	2479	182.11	0	182	2661
48910	2054	1257	681.57	554.94	2494	184.05	0	184	2678
49640	2056	1260.9	685.1	560.29	2506	185.79	0	186	2692
50370	2058	1264.7	688.5	565.41	2519	187.38	0	187	2706
51100	2060	1268.3	691.78	570.37	2530	188.83	0	189	2719
51830	2062	1276.2	697.83	577	2551	191	0	191	2742
52560	2064	1281.5	701.96	582.69	2566	192.92	0	193	2759
53290	2066	1286.3	705.69	588.03	2580	194.69	0	195	2775
54020	2068	1291	709.24	593.15	2593	196.33	0	196	2790
54750	2070	1295.4	712.67	598.11	2606	197.84	0	198	2804
55480	2072	1303.9	718.59	604.67	2627	199.93	0	200	2827
56210	2074	1309.9	722.79	610.3	2643	201.81	0	202	2845
56940	2076	1315.5	726.61	615.6	2658	203.57	0	204	2861
57670	2078	1320.8	730.24	620.69	2672	205.2	0	205	2877
58400	2080	1325.9	733.75	625.61	2685	206.71	0	207	2892
59130	2082	1334.7	739.37	632.04	2706	208.68	0	209	2915
59860	2084	1341.4	743.55	637.59	2723	210.45	0	210	2933
60590	2086	1347.5	747.36	642.81	2738	212.11	0	212	2950
61320	2088	1353.4	751	647.82	2752	213.66	0	214	2966
62050	2090	1359.1	754.49	652.65	2766	215.1	0	215	2981
62780	2092	1367.8	759.72	658.9	2786	216.88	0	217	3003
63510	2094	1374.9	763.77	664.33	2803	218.47	0	218	3021
64240	2096	1381.5	767.5	669.42	2818	219.98	0	220	3038
64970	2098	1387.8	771.06	674.3	2833	221.39	0	221	3055
65700	2100	1393.9	774.48	679	2847	222.72	0	223	3070
66430	2102	1402.5	779.28	685.02	2867	224.27	0	224	3091
67160	2104	1409.8	783.15	690.28	2883	225.67	0	226	3109
67890	2106	1416.6	786.74	695.21	2899	226.99	0	227	3126
69350	2110	1429.1	793.34	703.97	2926	228.29	0	228	3155
73000	2120	1463.7	810.92	728.2	3003	234.05	0	234	3237
82125	2145	1526.3	840.95	771.56	3139	244.29	0	244	3383

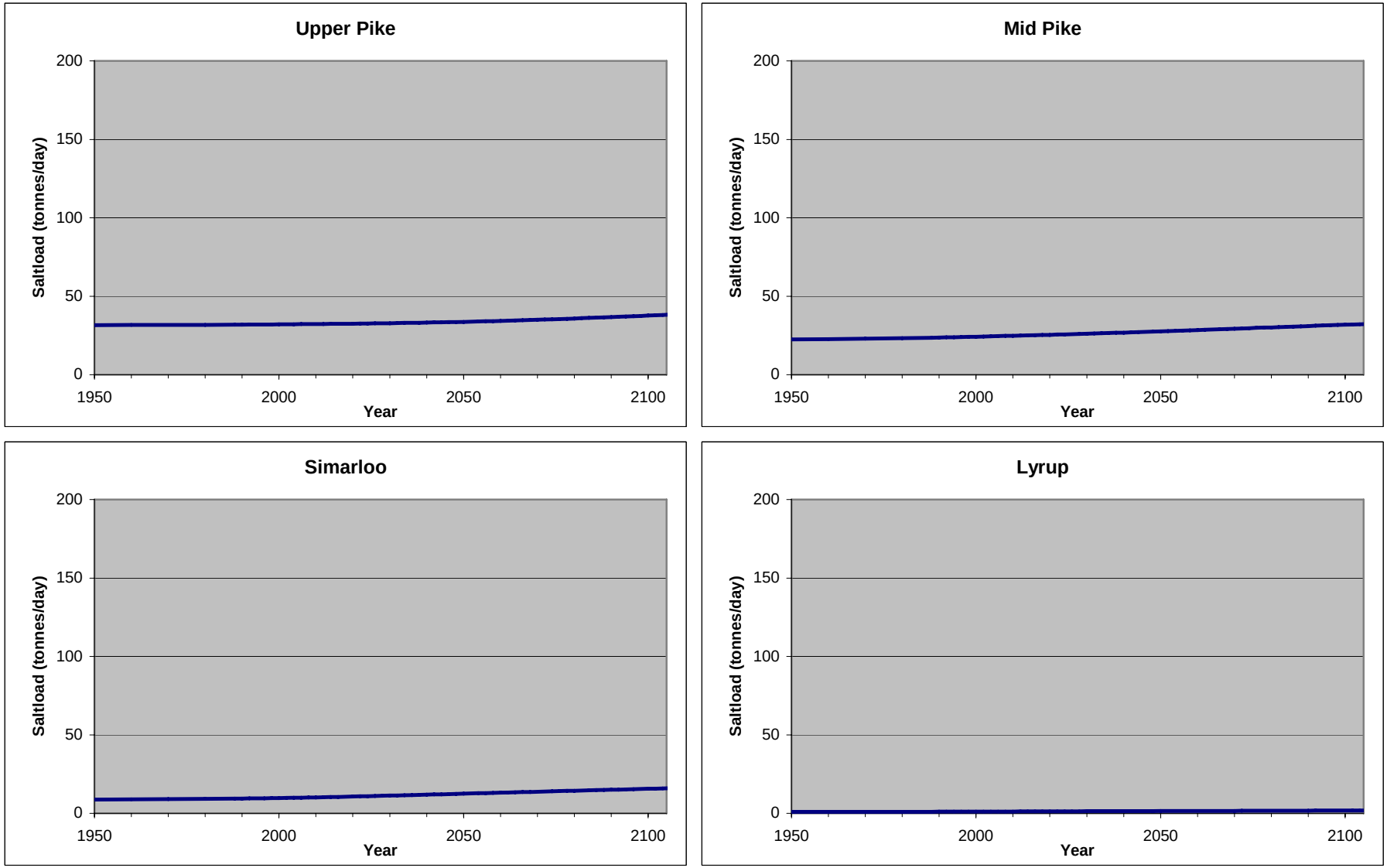
B-2 (S2-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-2 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
3650	1930	31.5	22.4	8.7	62.6	0.8	0.0	0.8	63.4
7300	1940	31.5	22.4	8.8	62.7	0.8	0.0	0.8	63.5
10950	1950	31.6	22.5	8.8	62.9	0.9	0.0	0.9	63.7
14600	1960	31.6	22.7	8.9	63.2	0.9	0.0	0.9	64.0
18250	1970	31.7	22.9	9.0	63.6	0.9	0.0	0.9	64.5
21900	1980	31.7	23.2	9.1	64.1	0.9	0.0	0.9	65.1
24820	1988	31.9	23.6	9.3	64.8	1.0	0.0	1.0	65.8
25550	1990	31.9	23.7	9.4	64.9	1.0	0.0	1.0	65.9
26280	1992	32.0	23.8	9.4	65.2	1.0	0.0	1.0	66.2
27010	1994	32.0	23.9	9.5	65.4	1.0	0.0	1.0	66.4
27740	1996	32.0	24.0	9.6	65.6	1.0	0.0	1.0	66.6
28470	1998	32.0	24.1	9.6	65.8	1.0	0.0	1.0	66.8
29200	2000	32.1	24.2	9.7	66.0	1.0	0.0	1.0	67.0
29930	2002	32.1	24.3	9.8	66.3	1.1	0.0	1.1	67.4
30660	2004	32.2	24.4	9.9	66.5	1.1	0.0	1.1	67.6
31390	2006	32.2	24.6	10.0	66.8	1.1	0.0	1.1	67.9
32120	2008	32.2	24.7	10.1	67.0	1.1	0.0	1.1	68.1
32850	2010	32.3	24.8	10.2	67.2	1.1	0.0	1.1	68.3
33580	2012	32.3	24.9	10.3	67.5	1.1	0.0	1.1	68.7
34310	2014	32.4	25.0	10.4	67.8	1.2	0.0	1.2	69.0
35040	2016	32.4	25.2	10.5	68.1	1.2	0.0	1.2	69.2
35770	2018	32.5	25.3	10.6	68.3	1.2	0.0	1.2	69.5
36500	2020	32.5	25.4	10.7	68.6	1.2	0.0	1.2	69.8
37230	2022	32.6	25.6	10.8	69.0	1.2	0.0	1.2	70.2
37960	2024	32.6	25.7	10.9	69.3	1.2	0.0	1.2	70.5
38690	2026	32.7	25.8	11.0	69.5	1.3	0.0	1.3	70.8
39420	2028	32.7	25.9	11.1	69.8	1.3	0.0	1.3	71.1
40150	2030	32.8	26.0	11.2	70.1	1.3	0.0	1.3	71.4
40880	2032	32.9	26.3	11.4	70.5	1.3	0.0	1.3	71.8
41610	2034	33.0	26.4	11.5	70.9	1.3	0.0	1.3	72.2
42340	2036	33.0	26.5	11.6	71.2	1.3	0.0	1.3	72.5
43070	2038	33.1	26.6	11.7	71.5	1.4	0.0	1.4	72.8
43800	2040	33.1	26.8	11.9	71.8	1.4	0.0	1.4	73.1
44530	2042	33.3	27.0	12.0	72.3	1.4	0.0	1.4	73.7
45260	2044	33.4	27.1	12.1	72.7	1.4	0.0	1.4	74.1
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

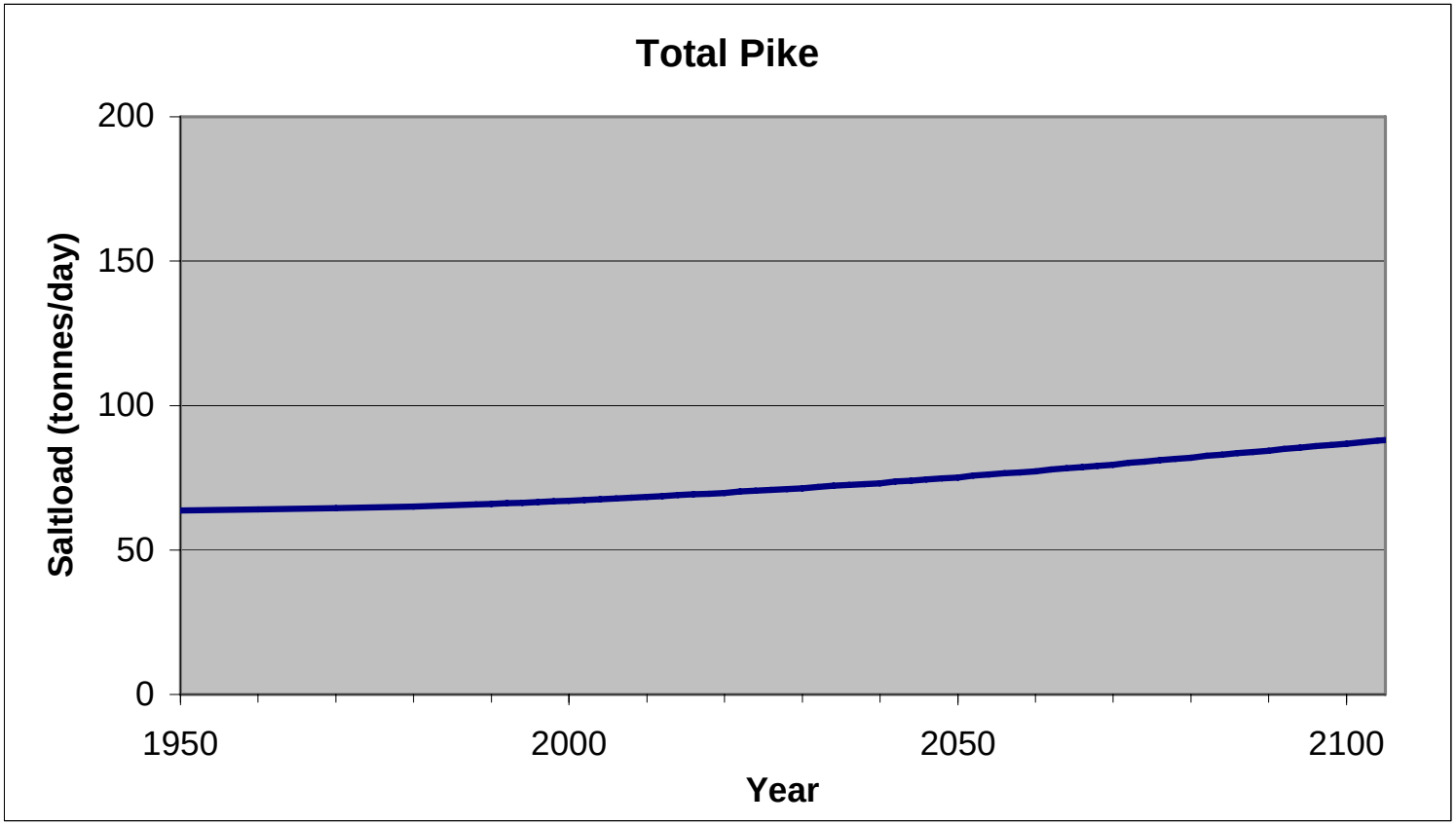
B-2 (S2-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-2 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
45990	2046	33.5	27.3	12.3	73.0	1.4	0.0	1.4	74.4
46720	2048	33.6	27.4	12.4	73.3	1.4	0.0	1.4	74.8
47450	2050	33.6	27.5	12.5	73.7	1.4	0.0	1.4	75.1
48180	2052	33.8	27.8	12.6	74.2	1.5	0.0	1.5	75.7
48910	2054	33.9	27.9	12.8	74.6	1.5	0.0	1.5	76.1
49640	2056	34.0	28.1	12.9	75.0	1.5	0.0	1.5	76.5
50370	2058	34.1	28.2	13.0	75.4	1.5	0.0	1.5	76.9
51100	2060	34.2	28.4	13.1	75.7	1.5	0.0	1.5	77.2
51830	2062	34.5	28.6	13.3	76.3	1.5	0.0	1.5	77.9
52560	2064	34.6	28.8	13.4	76.8	1.5	0.0	1.5	78.3
53290	2066	34.7	28.9	13.5	77.2	1.6	0.0	1.6	78.7
54020	2068	34.9	29.1	13.6	77.6	1.6	0.0	1.6	79.1
54750	2070	35.0	29.2	13.8	78.0	1.6	0.0	1.6	79.5
55480	2072	35.2	29.5	13.9	78.6	1.6	0.0	1.6	80.2
56210	2074	35.4	29.6	14.0	79.0	1.6	0.0	1.6	80.7
56940	2076	35.5	29.8	14.2	79.5	1.6	0.0	1.6	81.1
57670	2078	35.7	29.9	14.3	79.9	1.6	0.0	1.6	81.5
58400	2080	35.8	30.1	14.4	80.3	1.7	0.0	1.7	81.9
59130	2082	36.0	30.3	14.5	80.9	1.7	0.0	1.7	82.6
59860	2084	36.2	30.5	14.7	81.4	1.7	0.0	1.7	83.1
60590	2086	36.4	30.6	14.8	81.8	1.7	0.0	1.7	83.5
61320	2088	36.5	30.8	14.9	82.2	1.7	0.0	1.7	83.9
62050	2090	36.7	30.9	15.0	82.6	1.7	0.0	1.7	84.4
62780	2092	36.9	31.1	15.2	83.2	1.7	0.0	1.7	85.0
63510	2094	37.1	31.3	15.3	83.7	1.7	0.0	1.7	85.5
64240	2096	37.3	31.5	15.4	84.2	1.8	0.0	1.8	85.9
64970	2098	37.5	31.6	15.5	84.6	1.8	0.0	1.8	86.4
65700	2100	37.6	31.8	15.6	85.0	1.8	0.0	1.8	86.8
66430	2102	37.9	32.0	15.8	85.6	1.8	0.0	1.8	87.4
67160	2104	38.1	32.1	15.9	86.1	1.8	0.0	1.8	87.9
67890	2106	38.2	32.3	16.0	86.5	1.8	0.0	1.8	88.3
69350	2110	38.6	32.5	16.2	87.3	1.8	0.0	1.8	89.1
73000	2120	39.5	33.2	16.7	89.5	1.9	0.0	1.9	91.4
82125	2145	41.2	34.5	17.7	93.4	2.0	0.0	2.0	95.4
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

B-2 (S2-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-2 (Pike Area)



B-2 (S2-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-2 (Pike Area)



B-2 (S2-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-2 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		1169	546	380	***2095***	99	0	***99***	***2194***
365	**1886**	1169	546	380	***2095***	116	0	***116***	***2211***
18250	**1935**	1169	546	380	***2096***	202	0	***202***	***2298***
21900	**1945**	1169	547	381	***2096***	799	5	***804***	***2900***
23725	**1950**	1169	547	382	***2097***	1161	138	***1299***	***3396***
25550	**1955**	1169	547	382	***2098***	1059	92	***1151***	***3248***
30	**1955**	1169	548	387	***2104***	1067	92	***1159***	***3263***
365	**1956**	1178	629	427	***2234***	1272	109	***1381***	***3615***
1095	**1958**	1196	707	459	***2362***	1451	134	***1585***	***3947***
1825	**1960**	1206	738	474	***2417***	1519	143	***1661***	***4079***
2555	**1962**	1210	750	536	***2496***	1375	34	***1409***	***3906***
3285	**1964**	1213	759	554	***2525***	1355	21	***1376***	***3902***
3650	**1965**	1214	762	558	***2535***	1354	18	***1372***	***3907***
4015	**1966**	1216	777	562	***2555***	1354	17	***1371***	***3926***
4745	**1968**	1219	791	567	***2578***	1359	15	***1374***	***3951***
5475	**1970**	1222	799	571	***2592***	1364	14	***1378***	***3970***
6205	**1972**	1234	827	1251	***3311***	1472	32	***1503***	***4815***
6935	**1974**	1241	840	1542	***3623***	1535	47	***1582***	***5204***
7300	**1975**	1244	845	1628	***3717***	1554	53	***1607***	***5324***
7665	**1976**	1482	857	1693	***4033***	1569	56	***1626***	***5659***
8395	**1978**	1530	877	1783	***4190***	1590	61	***1651***	***5841***
9125	**1980**	1546	890	1845	***4281***	1603	64	***1667***	***5948***
9855	**1982**	1706	941	1792	***4439***	1579	53	***1632***	***6071***
10585	**1984**	1771	969	1793	***4532***	1606	51	***1657***	***6189***
10950	**1985**	1789	978	1798	***4566***	1619	52	***1670***	***6236***
11315	**1986**	1802	1026	1805	***4633***	1644	54	***1698***	***6330***
12045	**1988**	1821	1078	1822	***4721***	1739	67	***1806***	***6527***
12775	**1990**	1837	1105	1841	***4783***	1814	79	***1893***	***6676***
13505	**1992**	1880	1254	1736	***4870***	1863	87	***1951***	***6821***
14235	**1994**	1897	1330	1736	***4963***	1898	93	***1990***	***6953***
14600	**1995**	1904	1355	1746	***5006***	1911	95	***2006***	***7011***
14965	**1996**	1910	1365	1637	***4912***	1923	96	***2019***	***6930***
15695	**1998**	1919	1386	1543	***4848***	1941	98	***2040***	***6888***
16425	**2000**	1927	1404	1514	***4846***	1956	100	***2056***	***6902***
17155	**2002**	1946	1460	1506	***4913***	1967	101	***2069***	***6981***
17885	**2004**	1956	1485	1507	***4949***	1977	102	***2079***	***7028***
18250	**2005**	1961	1494	1509	***4964***	1981	103	***2083***	***7047***
365	**2006**	2009	1538	1512	***5058***	1984	103	***2088***	***7146***
1095	**2008**	2097	1611	1518	***5227***	1991	104	***2094***	***7321***
1825	**2010**	2148	1667	1526	***5341***	1996	104	***2100***	***7441***
2555	**2012**	2440	1707	1534	***5681***	2000	105	***2105***	***7786***
3285	**2014**	2583	1736	1543	***5863***	2004	105	***2109***	***7971***
4015	**2016**	2669	1759	1552	***5980***	2007	105	***2112***	***8092***

B-2 (S3A-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3A (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	2732	1777	1560	6069	2010	105	2115	8183
5475	2020	2791	1791	1569	6150	2012	106	2117	8268
6205	2022	2902	1808	1577	6287	2014	106	2119	8406
6935	2024	2993	1825	1584	6403	2015	106	2121	8524
7665	2026	3058	1839	1592	6488	2017	106	2123	8611
8395	2028	3109	1850	1599	6558	2018	106	2124	8682
9125	2030	3153	1859	1606	6618	2019	106	2125	8743
9855	2032	3193	1867	1612	6672	2020	106	2127	8799
10585	2034	3230	1874	1618	6722	2021	106	2127	8849
11315	2036	3263	1880	1624	6767	2022	106	2128	8896
12045	2038	3295	1885	1630	6810	2023	106	2129	8939
12775	2040	3324	1890	1635	6849	2023	106	2130	8979
13505	2042	3351	1894	1641	6885	2024	107	2130	9016
14235	2044	3376	1899	1646	6920	2024	107	2131	9051
14965	2046	3399	1902	1650	6952	2025	107	2131	9083
15695	2048	3421	1906	1655	6982	2025	107	2132	9113
16425	2050	3441	1909	1659	7010	2026	107	2132	9142
17155	2052	3460	1912	1664	7036	2026	107	2133	9169
17885	2054	3478	1915	1668	7061	2026	107	2133	9194
18615	2056	3495	1918	1671	7084	2027	107	2133	9217
19345	2058	3511	1921	1675	7106	2027	107	2134	9240
20075	2060	3525	1923	1679	7127	2027	107	2134	9261
20805	2062	3539	1926	1682	7147	2028	107	2134	9281
21535	2064	3552	1928	1686	7166	2028	107	2134	9300
22265	2066	3565	1930	1689	7184	2028	107	2135	9318
22995	2068	3577	1932	1692	7201	2028	107	2135	9335
23725	2070	3588	1934	1695	7217	2028	107	2135	9352
24455	2072	3598	1936	1698	7232	2029	107	2135	9367
25185	2074	3608	1938	1700	7247	2029	107	2136	9382
25915	2076	3618	1940	1703	7261	2029	107	2136	9396
26645	2078	3627	1942	1705	7274	2029	107	2136	9410
27375	2080	3636	1944	1708	7287	2029	107	2136	9423
28105	2082	3644	1945	1710	7299	2029	107	2136	9435
28835	2084	3652	1947	1712	7311	2029	107	2136	9447
29565	2086	3660	1948	1714	7322	2030	107	2137	9459
30295	2088	3667	1950	1716	7333	2030	107	2137	9470
31025	2090	3674	1951	1718	7343	2030	107	2137	9480
31755	2092	3680	1953	1720	7353	2030	107	2137	9490
32485	2094	3687	1954	1722	7363	2030	107	2137	9500
33215	2096	3693	1956	1724	7372	2030	107	2137	9509
33945	2098	3699	1957	1725	7381	2030	107	2137	9518
34675	2100	3704	1958	1727	7390	2030	107	2137	9527
35405	2102	3710	1959	1729	7398	2030	107	2137	9535
36135	2104	3715	1961	1730	7406	2031	107	2137	9543

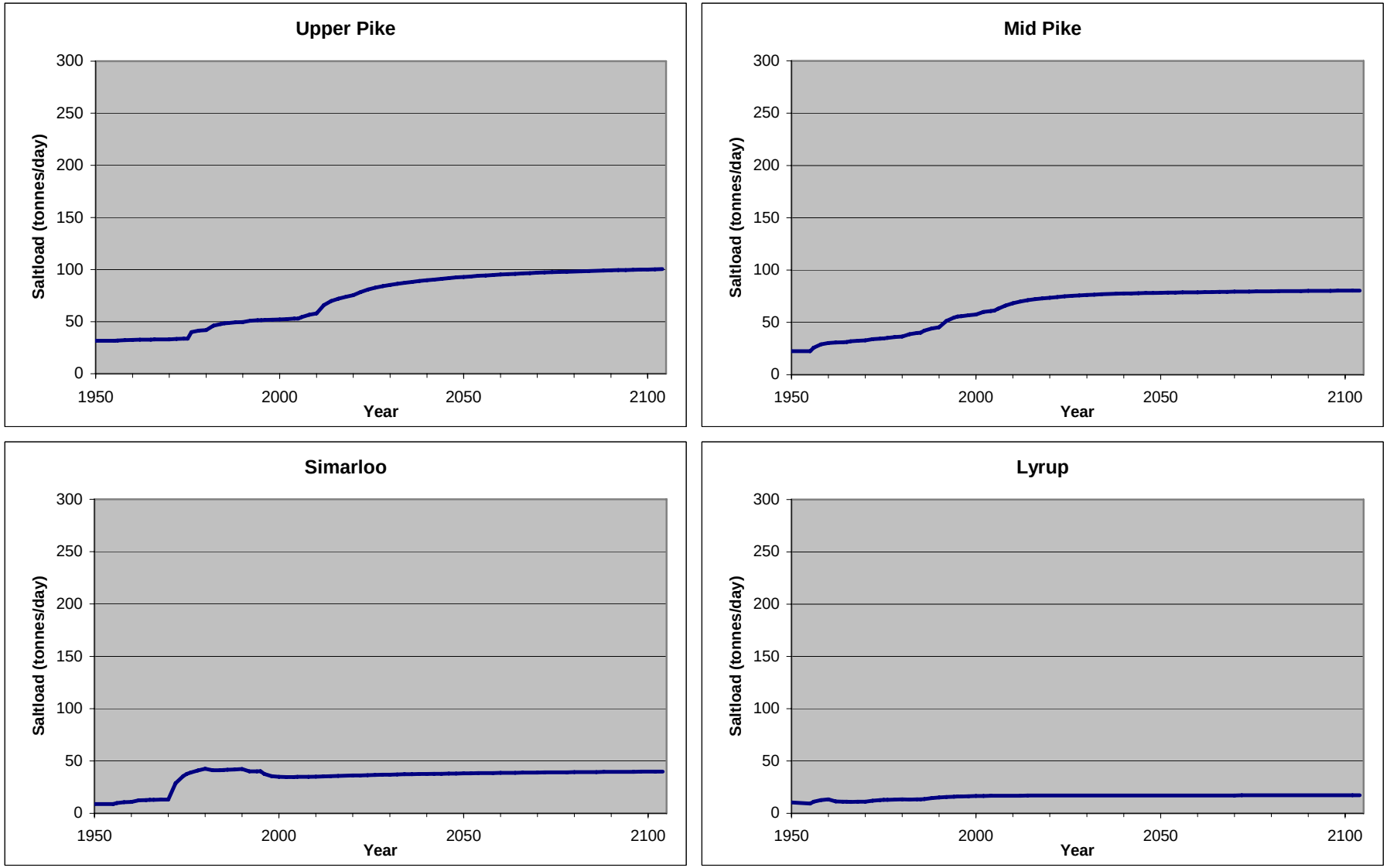
B-2 (S3A-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3A (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		31.6	22.4	8.7	**62.7**	0.8	0.0	**0.8**	***63.5***
365	**1886**	31.6	22.4	8.7	**62.7**	0.9	0.0	**0.9**	***63.6***
18250	**1935**	31.6	22.4	8.7	**62.7**	1.6	0.0	**1.6**	***64.3***
21900	**1945**	31.6	22.4	8.8	**62.7**	6.4	0.0	**6.4**	***69.2***
23725	**1950**	31.6	22.4	8.8	**62.7**	9.3	1.1	**10.4**	***73.1***
25550	**1955**	31.6	22.4	8.8	**62.8**	8.5	0.7	**9.2**	***72.0***
30	**1955**	31.6	22.5	8.9	**62.9**	8.5	0.7	**9.3**	***72.2***
365	**1956**	31.8	25.8	9.8	**67.4**	10.2	0.9	**11.0**	***78.5***
1095	**1958**	32.3	29.0	10.6	**71.8**	11.6	1.1	**12.7**	***84.5***
1825	**1960**	32.6	30.3	10.9	**73.7**	12.2	1.1	**13.3**	***87.0***
2555	**1962**	32.7	30.8	12.3	**75.8**	11.0	0.3	**11.3**	***87.0***
3285	**1964**	32.7	31.1	12.7	**76.6**	10.8	0.2	**11.0**	***87.6***
3650	**1965**	32.8	31.2	12.8	**76.9**	10.8	0.1	**11.0**	***87.9***
4015	**1966**	32.8	31.9	12.9	**77.6**	10.8	0.1	**11.0**	***88.6***
4745	**1968**	32.9	32.4	13.0	**78.4**	10.9	0.1	**11.0**	***89.4***
5475	**1970**	33.0	32.8	13.1	**78.9**	10.9	0.1	**11.0**	***89.9***
6205	**1972**	33.3	33.9	28.8	**96.0**	11.8	0.3	**12.0**	***108.0***
6935	**1974**	33.5	34.4	35.5	**103.4**	12.3	0.4	**12.7**	***116.1***
7300	**1975**	33.6	34.6	37.5	**105.7**	12.4	0.4	**12.9**	***118.5***
7665	**1976**	40.0	35.2	38.9	**114.1**	12.6	0.5	**13.0**	***127.1***
8395	**1978**	41.3	35.9	41.0	**118.3**	12.7	0.5	**13.2**	***131.5***
9125	**1980**	41.8	36.5	42.4	**120.7**	12.8	0.5	**13.3**	***134.0***
9855	**1982**	46.1	38.6	41.2	**125.9**	12.6	0.4	**13.1**	***138.9***
10585	**1984**	47.8	39.7	41.2	**128.7**	12.8	0.4	**13.3**	***142.0***
10950	**1985**	48.3	40.1	41.4	**129.8**	12.9	0.4	**13.4**	***143.1***
11315	**1986**	48.7	42.1	41.5	**132.2**	13.2	0.4	**13.6**	***145.8***
12045	**1988**	49.2	44.2	41.9	**135.3**	13.9	0.5	**14.4**	***149.7***
12775	**1990**	49.6	45.3	42.3	**137.2**	14.5	0.6	**15.1**	***152.4***
13505	**1992**	50.8	51.4	39.9	**142.1**	14.9	0.7	**15.6**	***157.7***
14235	**1994**	51.2	54.5	39.9	**145.7**	15.2	0.7	**15.9**	***161.6***
14600	**1995**	51.4	55.6	40.2	**147.1**	15.3	0.8	**16.0**	***163.2***
14965	**1996**	51.6	56.0	37.6	**145.2**	15.4	0.8	**16.2**	***161.3***
15695	**1998**	51.8	56.8	35.5	**144.1**	15.5	0.8	**16.3**	***160.4***
16425	**2000**	52.0	57.6	34.8	**144.4**	15.6	0.8	**16.4**	***160.9***
17155	**2002**	52.6	59.9	34.6	**147.1**	15.7	0.8	**16.5**	***163.6***
17885	**2004**	52.8	60.9	34.7	**148.4**	15.8	0.8	**16.6**	***165.0***
18250	**2005**	52.9	61.3	34.7	**148.9**	15.8	0.8	**16.7**	***165.6***
365	**2006**	54.2	63.1	34.8	**152.1**	15.9	0.8	**16.7**	***168.8***
1095	**2008**	56.6	66.1	34.9	**157.6**	15.9	0.8	**16.8**	***174.4***
1825	**2010**	58.0	68.3	35.1	**161.4**	16.0	0.8	**16.8**	***178.2***
2555	**2012**	65.9	70.0	35.3	**171.2**	16.0	0.8	**16.8**	***188.0***
3285	**2014**	69.7	71.2	35.5	**176.4**	16.0	0.8	**16.9**	***193.3***
4015	**2016**	72.1	72.1	35.7	**179.9**	16.1	0.8	**16.9**	***196.8***
Salinity (mg/L)		*27,000*	*41,000*	*23,000*		*8,000*	*8,000*		

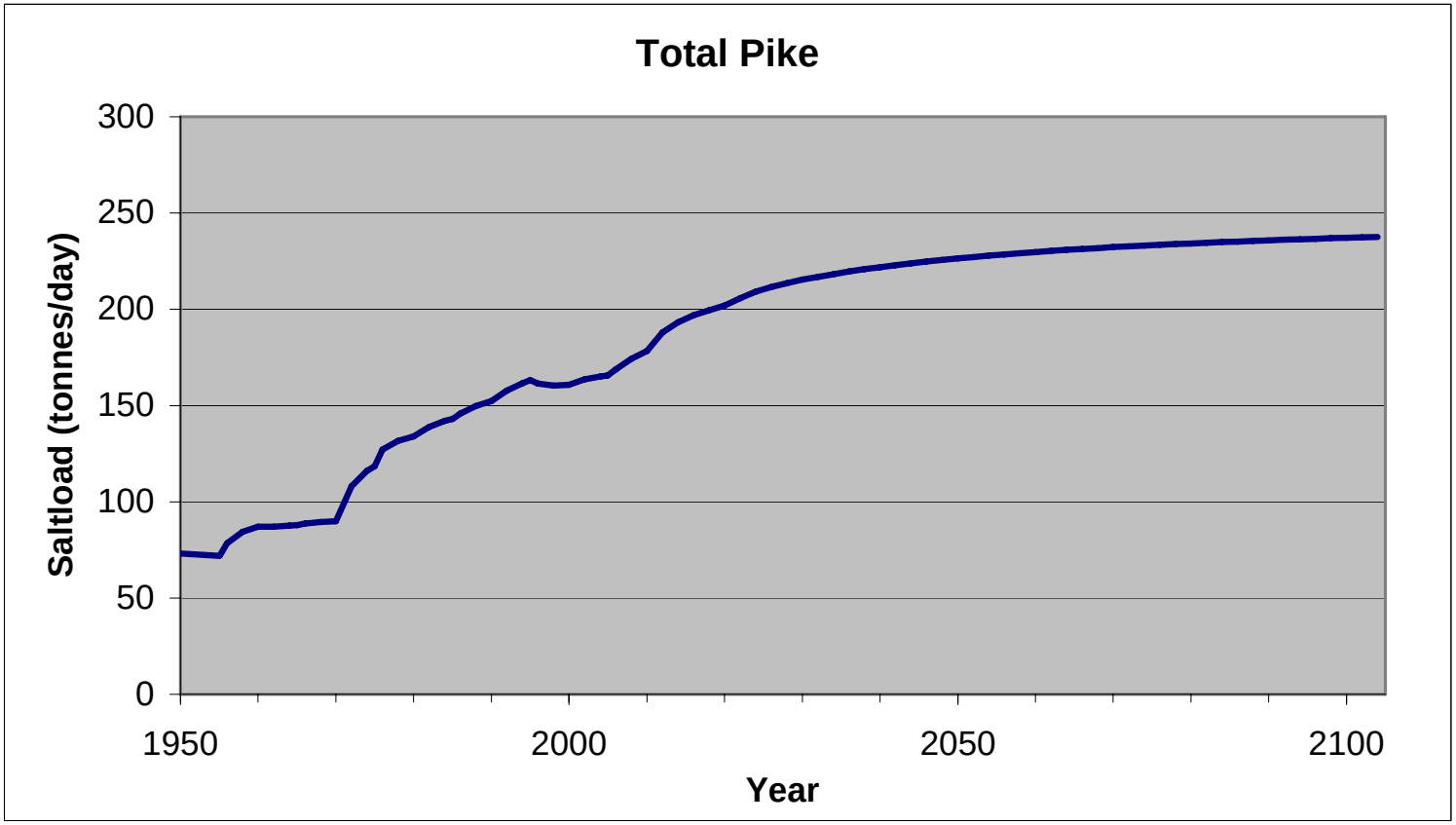
B-2 (S3A-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3A (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	73.8	72.8	35.9	182.5	16.1	0.8	16.9	199.4
5475	2020	75.4	73.4	36.1	184.9	16.1	0.8	16.9	201.8
6205	2022	78.4	74.1	36.3	188.7	16.1	0.8	17.0	205.7
6935	2024	80.8	74.8	36.4	192.1	16.1	0.8	17.0	209.1
7665	2026	82.6	75.4	36.6	194.6	16.1	0.8	17.0	211.6
8395	2028	83.9	75.9	36.8	196.6	16.1	0.8	17.0	213.6
9125	2030	85.1	76.2	36.9	198.3	16.2	0.8	17.0	215.3
9855	2032	86.2	76.6	37.1	199.8	16.2	0.8	17.0	216.9
10585	2034	87.2	76.8	37.2	201.2	16.2	0.9	17.0	218.3
11315	2036	88.1	77.1	37.4	202.5	16.2	0.9	17.0	219.6
12045	2038	89.0	77.3	37.5	203.7	16.2	0.9	17.0	220.8
12775	2040	89.7	77.5	37.6	204.8	16.2	0.9	17.0	221.9
13505	2042	90.5	77.7	37.7	205.9	16.2	0.9	17.0	222.9
14235	2044	91.1	77.8	37.8	206.8	16.2	0.9	17.0	223.9
14965	2046	91.8	78.0	38.0	207.7	16.2	0.9	17.1	224.8
15695	2048	92.4	78.1	38.1	208.6	16.2	0.9	17.1	225.6
16425	2050	92.9	78.3	38.2	209.3	16.2	0.9	17.1	226.4
17155	2052	93.4	78.4	38.3	210.1	16.2	0.9	17.1	227.1
17885	2054	93.9	78.5	38.4	210.8	16.2	0.9	17.1	227.8
18615	2056	94.4	78.6	38.4	211.4	16.2	0.9	17.1	228.5
19345	2058	94.8	78.7	38.5	212.1	16.2	0.9	17.1	229.1
20075	2060	95.2	78.8	38.6	212.6	16.2	0.9	17.1	229.7
20805	2062	95.6	78.9	38.7	213.2	16.2	0.9	17.1	230.3
21535	2064	95.9	79.0	38.8	213.7	16.2	0.9	17.1	230.8
22265	2066	96.2	79.1	38.8	214.2	16.2	0.9	17.1	231.3
22995	2068	96.6	79.2	38.9	214.7	16.2	0.9	17.1	231.8
23725	2070	96.9	79.3	39.0	215.1	16.2	0.9	17.1	232.2
24455	2072	97.2	79.4	39.0	215.6	16.2	0.9	17.1	232.7
25185	2074	97.4	79.5	39.1	216.0	16.2	0.9	17.1	233.1
25915	2076	97.7	79.5	39.2	216.4	16.2	0.9	17.1	233.5
26645	2078	97.9	79.6	39.2	216.8	16.2	0.9	17.1	233.9
27375	2080	98.2	79.7	39.3	217.1	16.2	0.9	17.1	234.2
28105	2082	98.4	79.8	39.3	217.5	16.2	0.9	17.1	234.6
28835	2084	98.6	79.8	39.4	217.8	16.2	0.9	17.1	234.9
29565	2086	98.8	79.9	39.4	218.1	16.2	0.9	17.1	235.2
30295	2088	99.0	79.9	39.5	218.4	16.2	0.9	17.1	235.5
31025	2090	99.2	80.0	39.5	218.7	16.2	0.9	17.1	235.8
31755	2092	99.4	80.1	39.6	219.0	16.2	0.9	17.1	236.1
32485	2094	99.5	80.1	39.6	219.3	16.2	0.9	17.1	236.4
33215	2096	99.7	80.2	39.6	219.5	16.2	0.9	17.1	236.6
33945	2098	99.9	80.2	39.7	219.8	16.2	0.9	17.1	236.9
34675	2100	100.0	80.3	39.7	220.0	16.2	0.9	17.1	237.1
35405	2102	100.2	80.3	39.8	220.3	16.2	0.9	17.1	237.4
36135	2104	100.3	80.4	39.8	220.5	16.2	0.9	17.1	237.6
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

B-2 (S3A-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3A (Pike Area)



B-2 (S3A-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-3A (Pike Area)



B-2 (S3A-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-3A (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		1169	546	380	***2095***	99	0	***99***	***2194***
365	**1886**	1169	546	380	***2095***	116	0	***116***	***2211***
18250	**1935**	1169	546	380	***2096***	202	0	***202***	***2298***
21900	**1945**	1169	547	381	***2096***	799	5	***804***	***2900***
23725	**1950**	1169	547	382	***2097***	1161	138	***1299***	***3396***
25550	**1955**	1169	547	382	***2098***	1059	92	***1151***	***3248***
30	**1955**	1169	548	387	***2104***	1067	92	***1159***	***3263***
365	**1956**	1178	629	427	***2234***	1272	109	***1381***	***3615***
1095	**1958**	1196	707	459	***2362***	1451	134	***1585***	***3947***
1825	**1960**	1206	738	474	***2417***	1519	143	***1661***	***4079***
2555	**1962**	1210	750	536	***2496***	1375	34	***1409***	***3906***
3285	**1964**	1213	759	554	***2525***	1355	21	***1376***	***3902***
3650	**1965**	1214	762	558	***2535***	1354	18	***1372***	***3907***
4015	**1966**	1216	777	562	***2555***	1354	17	***1371***	***3926***
4745	**1968**	1219	791	567	***2578***	1359	15	***1374***	***3951***
5475	**1970**	1222	799	571	***2592***	1364	14	***1378***	***3970***
6205	**1972**	1234	827	1251	***3311***	1472	32	***1503***	***4815***
6935	**1974**	1241	840	1542	***3623***	1535	47	***1582***	***5204***
7300	**1975**	1244	845	1628	***3717***	1554	53	***1607***	***5324***
7665	**1976**	1482	857	1693	***4033***	1569	56	***1626***	***5659***
8395	**1978**	1530	877	1783	***4190***	1590	61	***1651***	***5841***
9125	**1980**	1546	890	1845	***4281***	1603	64	***1667***	***5948***
9855	**1982**	1706	941	1792	***4439***	1579	53	***1632***	***6071***
10585	**1984**	1771	969	1793	***4532***	1606	51	***1657***	***6189***
10950	**1985**	1789	978	1798	***4566***	1619	52	***1670***	***6236***
11315	**1986**	1802	1026	1805	***4633***	1644	54	***1698***	***6330***
12045	**1988**	1821	1078	1822	***4721***	1739	67	***1806***	***6527***
12775	**1990**	1837	1105	1841	***4783***	1814	79	***1893***	***6676***
13505	**1992**	1880	1254	1736	***4870***	1863	87	***1951***	***6821***
14235	**1994**	1897	1330	1736	***4963***	1898	93	***1990***	***6953***
14600	**1995**	1904	1355	1746	***5006***	1911	95	***2006***	***7011***
14965	**1996**	1910	1365	1636	***4911***	1923	96	***2019***	***6930***
15695	**1998**	1919	1386	1532	***4837***	1941	98	***2040***	***6877***
16425	**2000**	1927	1404	1489	***4820***	1956	100	***2056***	***6876***
17155	**2002**	1666	1431	1455	***4553***	1773	60	***1833***	***6386***
17885	**2004**	1625	1444	1440	***4509***	1697	49	***1746***	***6255***
18250	**2005**	1615	1449	1435	***4499***	1675	46	***1721***	***6220***
365	**2006**	1652	1464	1432	***4547***	1659	43	***1702***	***6249***
1095	**2008**	1723	1511	1417	***4651***	1492	15	***1507***	***6158***
1825	**2010**	1762	1552	1412	***4727***	1417	7	***1424***	***6151***
2555	**2012**	1990	1570	1411	***4971***	1322	3	***1325***	***6296***
3285	**2014**	2089	1586	1410	***5085***	1269	1	***1270***	***6354***
4015	**2016**	2146	1599	1410	***5155***	1235	0	***1235***	***6390***

B-2 (S3B-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3B (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	2178	1601	1410	5188	1211	0	1211	6399
5475	2020	2219	1604	1411	5235	1194	0	1194	6428
6205	2022	2273	1525	1413	5211	1181	0	1181	6391
6935	2024	2315	1499	1415	5229	1171	0	1171	6400
7665	2026	2246	1489	1417	5153	1163	0	1163	6316
8395	2028	2227	1480	1420	5127	1157	0	1157	6284
9125	2030	2232	1477	1422	5131	1153	0	1153	6284
9855	2032	2184	1477	1222	4883	1149	0	1149	6031
10585	2034	2165	1476	1141	4782	1146	0	1146	5928
11315	2036	2160	1476	1101	4737	1143	0	1143	5880
12045	2038	2160	1475	1078	4714	1141	0	1141	5855
12775	2040	2164	1475	1063	4702	1139	0	1139	5841
13505	2042	2170	1475	1054	4698	1138	0	1138	5835
14235	2044	2175	1475	1047	4697	1136	0	1136	5833
14965	2046	2181	1475	1042	4698	1135	0	1135	5834
15695	2048	2188	1475	1039	4701	1135	0	1135	5836
16425	2050	2194	1476	1036	4705	1134	0	1134	5839
17155	2052	2200	1476	1034	4710	1133	0	1133	5843
17885	2054	2205	1477	1033	4715	1133	0	1133	5848
18615	2056	2211	1477	1033	4720	1133	0	1133	5853
19345	2058	2216	1478	1032	4726	1132	0	1132	5858
20075	2060	2221	1478	1032	4732	1132	0	1132	5863
20805	2062	2226	1479	1032	4737	1132	0	1132	5869
21535	2064	2230	1480	1033	4743	1132	0	1132	5874
22265	2066	2234	1481	1033	4748	1131	0	1131	5879
22995	2068	2238	1481	1034	4753	1131	0	1131	5885
23725	2070	2242	1482	1034	4759	1131	0	1131	5890
24455	2072	2246	1483	1035	4764	1131	0	1131	5895
25185	2074	2249	1484	1036	4769	1131	0	1131	5900
25915	2076	2253	1484	1037	4774	1131	0	1131	5905
26645	2078	2256	1485	1038	4778	1131	0	1131	5909
27375	2080	2259	1486	1038	4783	1131	0	1131	5914
28105	2082	2262	1486	1039	4788	1131	0	1131	5918
28835	2084	2265	1487	1040	4792	1131	0	1131	5923
29565	2086	2267	1488	1041	4796	1131	0	1131	5927
30295	2088	2270	1488	1042	4800	1131	0	1131	5931
31025	2090	2272	1489	1043	4804	1131	0	1131	5935
31755	2092	2275	1490	1044	4808	1131	0	1131	5939
32485	2094	2277	1490	1045	4812	1131	0	1131	5943
33215	2096	2279	1491	1046	4815	1131	0	1131	5946
33945	2098	2281	1492	1046	4819	1131	0	1131	5950
34675	2100	2283	1492	1047	4823	1131	0	1131	5954
35405	2102	2285	1493	1048	4826	1131	0	1131	5957
36135	2104	2287	1493	1049	4829	1131	0	1131	5960

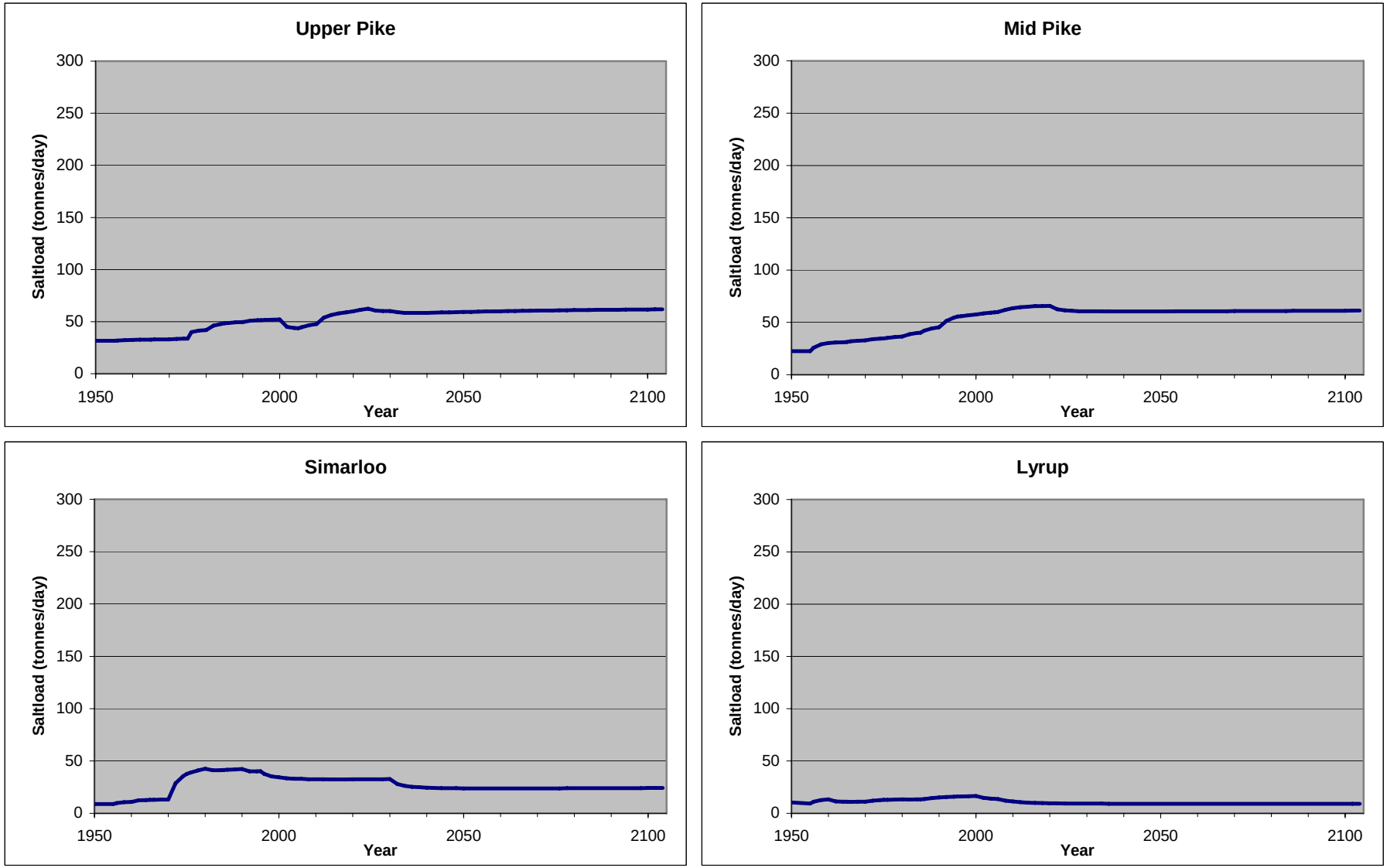
B-2 (S3B-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-3B (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		31.6	22.4	8.7	**62.7**	0.8	0.0	**0.8**	***63.5***
365	**1886**	31.6	22.4	8.7	**62.7**	0.9	0.0	**0.9**	***63.6***
18250	**1935**	31.6	22.4	8.7	**62.7**	1.6	0.0	**1.6**	***64.3***
21900	**1945**	31.6	22.4	8.8	**62.7**	6.4	0.0	**6.4**	***69.2***
23725	**1950**	31.6	22.4	8.8	**62.7**	9.3	1.1	**10.4**	***73.1***
25550	**1955**	31.6	22.4	8.8	**62.8**	8.5	0.7	**9.2**	***72.0***
30	**1955**	31.6	22.5	8.9	**62.9**	8.5	0.7	**9.3**	***72.2***
365	**1956**	31.8	25.8	9.8	**67.4**	10.2	0.9	**11.0**	***78.5***
1095	**1958**	32.3	29.0	10.6	**71.8**	11.6	1.1	**12.7**	***84.5***
1825	**1960**	32.6	30.3	10.9	**73.7**	12.2	1.1	**13.3**	***87.0***
2555	**1962**	32.7	30.8	12.3	**75.8**	11.0	0.3	**11.3**	***87.0***
3285	**1964**	32.7	31.1	12.7	**76.6**	10.8	0.2	**11.0**	***87.6***
3650	**1965**	32.8	31.2	12.8	**76.9**	10.8	0.1	**11.0**	***87.9***
4015	**1966**	32.8	31.9	12.9	**77.6**	10.8	0.1	**11.0**	***88.6***
4745	**1968**	32.9	32.4	13.0	**78.4**	10.9	0.1	**11.0**	***89.4***
5475	**1970**	33.0	32.8	13.1	**78.9**	10.9	0.1	**11.0**	***89.9***
6205	**1972**	33.3	33.9	28.8	**96.0**	11.8	0.3	**12.0**	***108.0***
6935	**1974**	33.5	34.4	35.5	**103.4**	12.3	0.4	**12.7**	***116.1***
7300	**1975**	33.6	34.6	37.5	**105.7**	12.4	0.4	**12.9**	***118.5***
7665	**1976**	40.0	35.2	38.9	**114.1**	12.6	0.5	**13.0**	***127.1***
8395	**1978**	41.3	35.9	41.0	**118.3**	12.7	0.5	**13.2**	***131.5***
9125	**1980**	41.8	36.5	42.4	**120.7**	12.8	0.5	**13.3**	***134.0***
9855	**1982**	46.1	38.6	41.2	**125.9**	12.6	0.4	**13.1**	***138.9***
10585	**1984**	47.8	39.7	41.2	**128.7**	12.8	0.4	**13.3**	***142.0***
10950	**1985**	48.3	40.1	41.4	**129.8**	12.9	0.4	**13.4**	***143.1***
11315	**1986**	48.7	42.1	41.5	**132.2**	13.2	0.4	**13.6**	***145.8***
12045	**1988**	49.2	44.2	41.9	**135.3**	13.9	0.5	**14.4**	***149.7***
12775	**1990**	49.6	45.3	42.3	**137.2**	14.5	0.6	**15.1**	***152.4***
13505	**1992**	50.8	51.4	39.9	**142.1**	14.9	0.7	**15.6**	***157.7***
14235	**1994**	51.2	54.5	39.9	**145.7**	15.2	0.7	**15.9**	***161.6***
14600	**1995**	51.4	55.6	40.2	**147.1**	15.3	0.8	**16.0**	***163.2***
14965	**1996**	51.6	56.0	37.6	**145.2**	15.4	0.8	**16.2**	***161.3***
15695	**1998**	51.8	56.8	35.2	**143.9**	15.5	0.8	**16.3**	***160.2***
16425	**2000**	52.0	57.6	34.3	**143.8**	15.6	0.8	**16.4**	***160.3***
17155	**2002**	45.0	58.7	33.5	**137.1**	14.2	0.5	**14.7**	***151.8***
17885	**2004**	43.9	59.2	33.1	**136.2**	13.6	0.4	**14.0**	***150.2***
18250	**2005**	43.6	59.4	33.0	**136.0**	13.4	0.4	**13.8**	***149.8***
365	**2006**	44.6	60.0	32.9	**137.5**	13.3	0.3	**13.6**	***151.2***
1095	**2008**	46.5	62.0	32.6	**141.1**	11.9	0.1	**12.1**	***153.1***
1825	**2010**	47.6	63.6	32.5	**143.7**	11.3	0.1	**11.4**	***155.1***
2555	**2012**	53.7	64.4	32.4	**150.5**	10.6	0.0	**10.6**	***161.1***
3285	**2014**	56.4	65.0	32.4	**153.8**	10.2	0.0	**10.2**	***164.0***
4015	**2016**	58.0	65.6	32.4	**155.9**	9.9	0.0	**9.9**	***165.8***
Salinity (mg/L)		*27,000*	*41,000*	*23,000*		*8,000*	*8,000*		

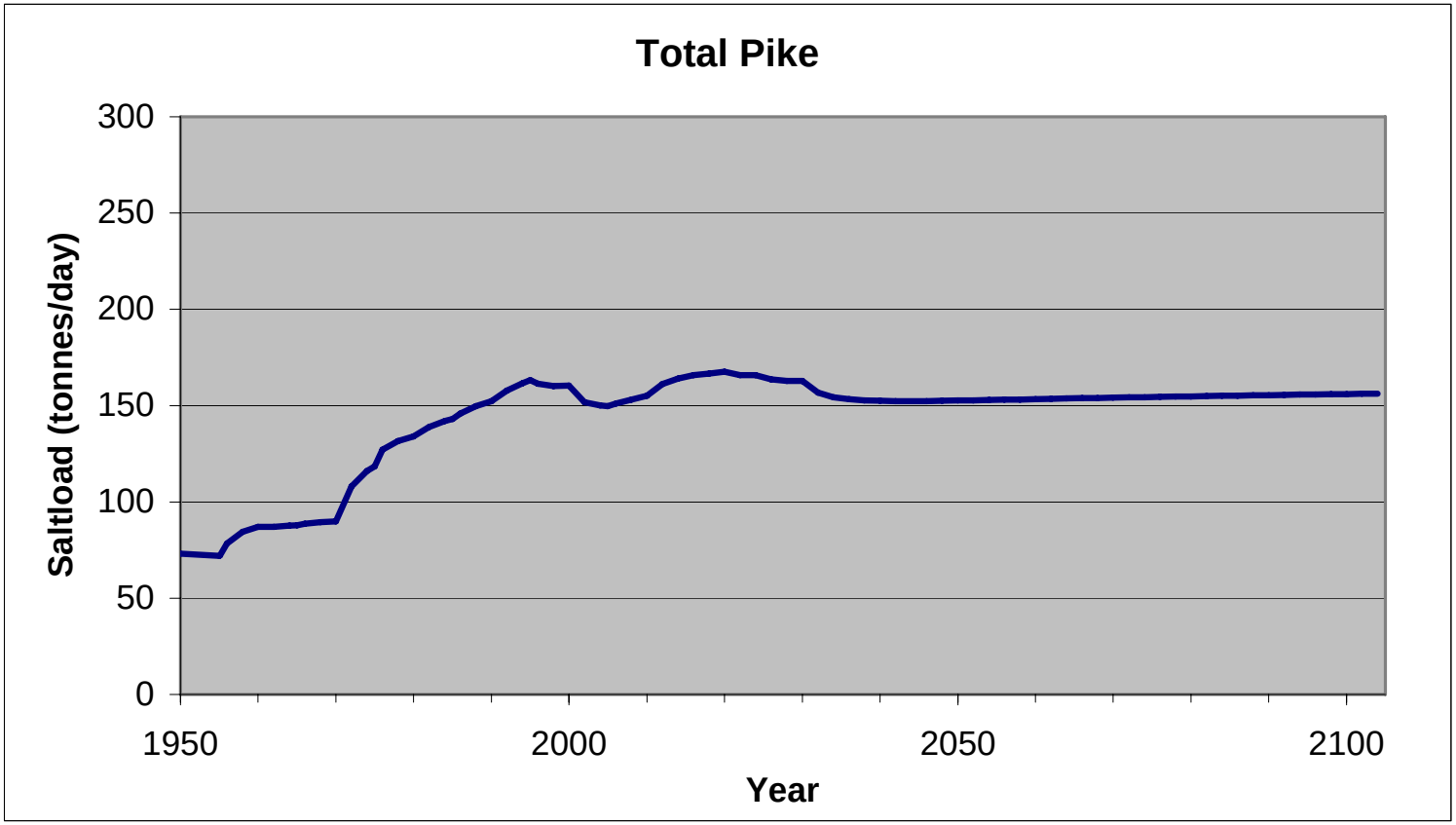
B-2 (S3B-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3B (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	58.8	65.6	32.4	156.8	9.7	0.0	9.7	166.5
5475	2020	59.9	65.8	32.5	158.1	9.5	0.0	9.5	167.7
6205	2022	61.4	62.5	32.5	156.4	9.4	0.0	9.4	165.8
6935	2024	62.5	61.5	32.5	156.5	9.4	0.0	9.4	165.9
7665	2026	60.7	61.0	32.6	154.3	9.3	0.0	9.3	163.6
8395	2028	60.1	60.7	32.7	153.5	9.3	0.0	9.3	162.7
9125	2030	60.3	60.6	32.7	153.5	9.2	0.0	9.2	162.8
9855	2032	59.0	60.5	28.1	147.6	9.2	0.0	9.2	156.8
10585	2034	58.4	60.5	26.2	145.2	9.2	0.0	9.2	154.4
11315	2036	58.3	60.5	25.3	144.2	9.1	0.0	9.1	153.3
12045	2038	58.3	60.5	24.8	143.6	9.1	0.0	9.1	152.7
12775	2040	58.4	60.5	24.5	143.4	9.1	0.0	9.1	152.5
13505	2042	58.6	60.5	24.2	143.3	9.1	0.0	9.1	152.4
14235	2044	58.7	60.5	24.1	143.3	9.1	0.0	9.1	152.4
14965	2046	58.9	60.5	24.0	143.3	9.1	0.0	9.1	152.4
15695	2048	59.1	60.5	23.9	143.4	9.1	0.0	9.1	152.5
16425	2050	59.2	60.5	23.8	143.6	9.1	0.0	9.1	152.6
17155	2052	59.4	60.5	23.8	143.7	9.1	0.0	9.1	152.8
17885	2054	59.5	60.5	23.8	143.8	9.1	0.0	9.1	152.9
18615	2056	59.7	60.6	23.7	144.0	9.1	0.0	9.1	153.1
19345	2058	59.8	60.6	23.7	144.2	9.1	0.0	9.1	153.2
20075	2060	60.0	60.6	23.7	144.3	9.1	0.0	9.1	153.4
20805	2062	60.1	60.6	23.7	144.5	9.1	0.0	9.1	153.5
21535	2064	60.2	60.7	23.8	144.6	9.1	0.0	9.1	153.7
22265	2066	60.3	60.7	23.8	144.8	9.1	0.0	9.1	153.8
22995	2068	60.4	60.7	23.8	144.9	9.1	0.0	9.1	154.0
23725	2070	60.5	60.8	23.8	145.1	9.0	0.0	9.0	154.1
24455	2072	60.6	60.8	23.8	145.2	9.0	0.0	9.0	154.3
25185	2074	60.7	60.8	23.8	145.4	9.0	0.0	9.0	154.4
25915	2076	60.8	60.9	23.8	145.5	9.0	0.0	9.0	154.6
26645	2078	60.9	60.9	23.9	145.7	9.0	0.0	9.0	154.7
27375	2080	61.0	60.9	23.9	145.8	9.0	0.0	9.0	154.8
28105	2082	61.1	60.9	23.9	145.9	9.0	0.0	9.0	155.0
28835	2084	61.1	61.0	23.9	146.0	9.0	0.0	9.0	155.1
29565	2086	61.2	61.0	23.9	146.2	9.0	0.0	9.0	155.2
30295	2088	61.3	61.0	24.0	146.3	9.0	0.0	9.0	155.3
31025	2090	61.3	61.1	24.0	146.4	9.0	0.0	9.0	155.4
31755	2092	61.4	61.1	24.0	146.5	9.0	0.0	9.0	155.5
32485	2094	61.5	61.1	24.0	146.6	9.0	0.0	9.0	155.7
33215	2096	61.5	61.1	24.0	146.7	9.0	0.0	9.0	155.8
33945	2098	61.6	61.2	24.1	146.8	9.0	0.0	9.0	155.9
34675	2100	61.6	61.2	24.1	146.9	9.0	0.0	9.0	156.0
35405	2102	61.7	61.2	24.1	147.0	9.0	0.0	9.0	156.1
36135	2104	61.7	61.2	24.1	147.1	9.0	0.0	9.0	156.1
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

B-2 (S3B-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-3B (Pike Area)



B-2 (S3B-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-3B (Pike Area)



B-2 (S3B-6). Graph of total modelled saltload (tonnes/day) entering the River Murray in Scenario-3B (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		1169	546	380	***2095***	99	0	***99***	***2194***
365	**1886**	1169	546	380	***2095***	116	0	***116***	***2211***
18250	**1935**	1169	546	380	***2096***	202	0	***202***	***2298***
21900	**1945**	1169	547	381	***2096***	799	5	***804***	***2900***
23725	**1950**	1169	547	382	***2097***	1161	138	***1299***	***3396***
25550	**1955**	1169	547	382	***2098***	1059	92	***1151***	***3248***
30	**1955**	1169	548	387	***2104***	1067	92	***1159***	***3263***
365	**1956**	1178	629	427	***2234***	1272	109	***1381***	***3615***
1095	**1958**	1196	707	459	***2362***	1451	134	***1585***	***3947***
1825	**1960**	1206	738	474	***2417***	1519	143	***1661***	***4079***
2555	**1962**	1210	750	536	***2496***	1375	34	***1409***	***3906***
3285	**1964**	1213	759	554	***2525***	1355	21	***1376***	***3902***
3650	**1965**	1214	762	558	***2535***	1354	18	***1372***	***3907***
4015	**1966**	1216	777	562	***2555***	1354	17	***1371***	***3926***
4745	**1968**	1219	791	567	***2578***	1359	15	***1374***	***3951***
5475	**1970**	1222	799	571	***2592***	1364	14	***1378***	***3970***
6205	**1972**	1234	827	1251	***3311***	1472	32	***1503***	***4815***
6935	**1974**	1241	840	1542	***3623***	1535	47	***1582***	***5204***
7300	**1975**	1244	845	1628	***3717***	1554	53	***1607***	***5324***
7665	**1976**	1482	857	1693	***4033***	1569	56	***1626***	***5659***
8395	**1978**	1530	877	1783	***4190***	1590	61	***1651***	***5841***
9125	**1980**	1546	890	1845	***4281***	1603	64	***1667***	***5948***
9855	**1982**	1706	941	1792	***4439***	1579	53	***1632***	***6071***
10585	**1984**	1771	969	1793	***4532***	1606	51	***1657***	***6189***
10950	**1985**	1789	978	1798	***4566***	1619	52	***1670***	***6236***
11315	**1986**	1802	1026	1805	***4633***	1644	54	***1698***	***6330***
12045	**1988**	1821	1078	1822	***4721***	1739	67	***1806***	***6527***
12775	**1990**	1837	1105	1841	***4783***	1814	79	***1893***	***6676***
13505	**1992**	1880	1254	1734	***4868***	1864	87	***1951***	***6819***
14235	**1994**	1897	1330	1735	***4962***	1898	93	***1990***	***6952***
14600	**1995**	1904	1355	1745	***5005***	1911	95	***2006***	***7010***
14965	**1996**	1910	1365	1834	***5110***	1972	98	***2069***	***7179***
15695	**1998**	1919	1386	1776	***5081***	2022	106	***2128***	***7209***
16425	**2000**	1927	1404	1745	***5077***	2058	111	***2170***	***7247***
17155	**2002**	1667	1432	1679	***4778***	1876	71	***1947***	***6725***
17885	**2004**	1625	1445	1664	***4734***	1807	60	***1867***	***6601***
18250	**2005**	1616	1450	1659	***4725***	1788	57	***1845***	***6570***
365	**2006**	1652	1465	1657	***4773***	1775	55	***1829***	***6603***
1095	**2008**	1723	1513	1613	***4849***	1598	23	***1621***	***6470***
1825	**2010**	1762	1554	1607	***4923***	1522	12	***1534***	***6457***
2555	**2012**	1990	1573	1605	***5168***	1426	7	***1433***	***6601***
3285	**2014**	2089	1593	1605	***5286***	1372	5	***1377***	***6663***
4015	**2016**	2147	1611	1605	***5363***	1338	4	***1341***	***6704***

B-2 (S4-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-4 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	2190	1645	1606	5441	1314	3	1317	6758
5475	2020	2243	1677	1608	5528	1298	2	1300	6828
6205	2022	2306	1642	1639	5586	1310	1	1311	6897
6935	2024	2356	1640	1655	5651	1314	1	1315	6966
7665	2026	2294	1648	1667	5608	1319	1	1321	6929
8395	2028	2280	1652	1677	5609	1325	1	1327	6935
9125	2030	2307	1662	1685	5654	1331	2	1332	6986
9855	2032	2280	1673	1490	5442	1336	2	1337	6779
10585	2034	2274	1681	1414	5368	1340	2	1342	6710
11315	2036	2279	1687	1378	5344	1343	2	1345	6690
12045	2038	2287	1692	1359	5338	1346	2	1349	6686
12775	2040	2297	1696	1347	5340	1349	2	1351	6691
13505	2042	2337	1699	1340	5377	1351	2	1354	6731
14235	2044	2427	1704	1336	5467	1353	2	1355	6823
14965	2046	2487	1709	1334	5530	1355	2	1357	6887
15695	2048	2533	1712	1333	5578	1356	2	1358	6936
16425	2050	2569	1715	1333	5617	1357	3	1360	6977
17155	2052	2599	1718	1333	5650	1358	3	1361	7011
17885	2054	2626	1721	1333	5679	1359	3	1361	7041
18615	2056	2648	1723	1334	5705	1360	3	1362	7067
19345	2058	2669	1725	1335	5729	1360	3	1363	7092
20075	2060	2687	1727	1337	5751	1361	3	1363	7114
20805	2062	2704	1729	1338	5770	1361	3	1364	7134
21535	2064	2719	1731	1340	5789	1362	3	1364	7153
22265	2066	2733	1732	1341	5807	1362	3	1365	7171
22995	2068	2746	1734	1343	5823	1362	3	1365	7188
23725	2070	2759	1736	1344	5838	1363	3	1365	7204
24455	2072	2770	1737	1346	5853	1363	3	1365	7218
25185	2074	2781	1739	1347	5867	1363	3	1366	7233
25915	2076	2792	1740	1349	5880	1363	3	1366	7246
26645	2078	2802	1741	1350	5893	1364	3	1366	7259
27375	2080	2811	1743	1352	5905	1364	3	1366	7272
28105	2082	2820	1744	1353	5917	1364	3	1367	7284
28835	2084	2829	1745	1355	5929	1364	3	1367	7295
29565	2086	2837	1746	1356	5940	1364	3	1367	7307
30295	2088	2846	1748	1358	5951	1364	3	1367	7317
31025	2090	2853	1749	1359	5961	1364	3	1367	7328
31755	2092	2861	1750	1360	5971	1364	3	1367	7338
32485	2094	2868	1751	1361	5981	1365	3	1367	7348
33215	2096	2876	1752	1363	5990	1365	3	1367	7358
33945	2098	2883	1753	1364	5999	1365	3	1367	7367
34675	2100	2889	1754	1365	6008	1365	3	1368	7376
35405	2102	2896	1755	1366	6017	1365	3	1368	7384
36135	2104	2902	1756	1367	6025	1365	3	1368	7393

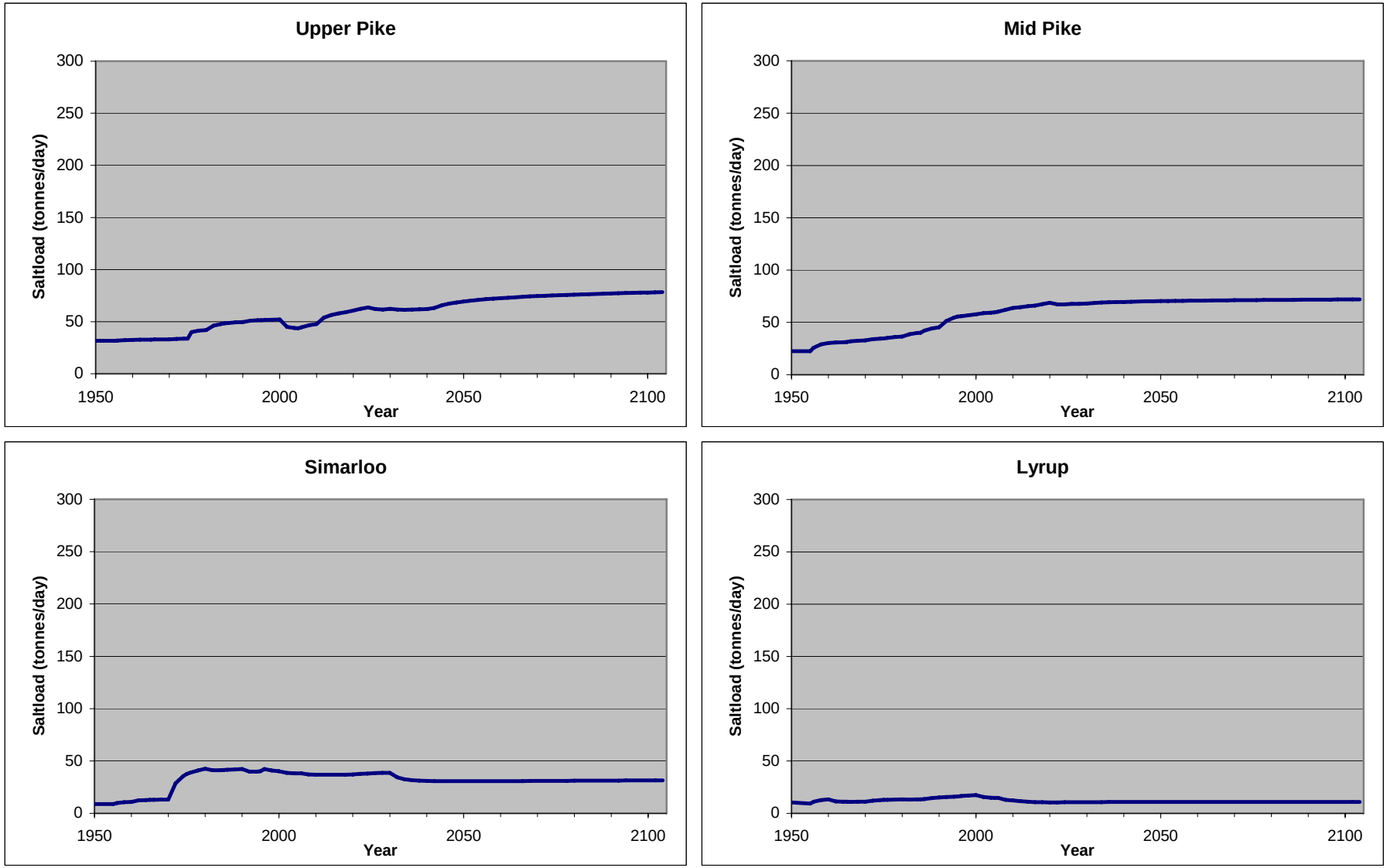
B-2 (S4-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-4 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		31.6	22.4	8.7	**62.7**	0.8	0.0	**0.8**	***63.5***
365	**1886**	31.6	22.4	8.7	**62.7**	0.9	0.0	**0.9**	***63.6***
18250	**1935**	31.6	22.4	8.7	**62.7**	1.6	0.0	**1.6**	***64.3***
21900	**1945**	31.6	22.4	8.8	**62.7**	6.4	0.0	**6.4**	***69.2***
23725	**1950**	31.6	22.4	8.8	**62.7**	9.3	1.1	**10.4**	***73.1***
25550	**1955**	31.6	22.4	8.8	**62.8**	8.5	0.7	**9.2**	***72.0***
30	**1955**	31.6	22.5	8.9	**62.9**	8.5	0.7	**9.3**	***72.2***
365	**1956**	31.8	25.8	9.8	**67.4**	10.2	0.9	**11.0**	***78.5***
1095	**1958**	32.3	29.0	10.6	**71.8**	11.6	1.1	**12.7**	***84.5***
1825	**1960**	32.6	30.3	10.9	**73.7**	12.2	1.1	**13.3**	***87.0***
2555	**1962**	32.7	30.8	12.3	**75.8**	11.0	0.3	**11.3**	***87.0***
3285	**1964**	32.7	31.1	12.7	**76.6**	10.8	0.2	**11.0**	***87.6***
3650	**1965**	32.8	31.2	12.8	**76.9**	10.8	0.1	**11.0**	***87.9***
4015	**1966**	32.8	31.9	12.9	**77.6**	10.8	0.1	**11.0**	***88.6***
4745	**1968**	32.9	32.4	13.0	**78.4**	10.9	0.1	**11.0**	***89.4***
5475	**1970**	33.0	32.8	13.1	**78.9**	10.9	0.1	**11.0**	***89.9***
6205	**1972**	33.3	33.9	28.8	**96.0**	11.8	0.3	**12.0**	***108.0***
6935	**1974**	33.5	34.4	35.5	**103.4**	12.3	0.4	**12.7**	***116.1***
7300	**1975**	33.6	34.6	37.5	**105.7**	12.4	0.4	**12.9**	***118.5***
7665	**1976**	40.0	35.2	38.9	**114.1**	12.6	0.5	**13.0**	***127.1***
8395	**1978**	41.3	35.9	41.0	**118.3**	12.7	0.5	**13.2**	***131.5***
9125	**1980**	41.8	36.5	42.4	**120.7**	12.8	0.5	**13.3**	***134.0***
9855	**1982**	46.1	38.6	41.2	**125.9**	12.6	0.4	**13.1**	***138.9***
10585	**1984**	47.8	39.7	41.2	**128.7**	12.8	0.4	**13.3**	***142.0***
10950	**1985**	48.3	40.1	41.4	**129.8**	12.9	0.4	**13.4**	***143.1***
11315	**1986**	48.7	42.1	41.5	**132.2**	13.2	0.4	**13.6**	***145.8***
12045	**1988**	49.2	44.2	41.9	**135.3**	13.9	0.5	**14.4**	***149.7***
12775	**1990**	49.6	45.3	42.3	**137.2**	14.5	0.6	**15.1**	***152.4***
13505	**1992**	50.8	51.4	39.9	**142.1**	14.9	0.7	**15.6**	***157.7***
14235	**1994**	51.2	54.5	39.9	**145.7**	15.2	0.7	**15.9**	***161.6***
14600	**1995**	51.4	55.6	40.1	**147.1**	15.3	0.8	**16.0**	***163.2***
14965	**1996**	51.6	56.0	42.2	**149.7**	15.8	0.8	**16.6**	***166.3***
15695	**1998**	51.8	56.8	40.9	**149.5**	16.2	0.8	**17.0**	***166.5***
16425	**2000**	52.0	57.6	40.1	**149.8**	16.5	0.9	**17.4**	***167.1***
17155	**2002**	45.0	58.7	38.6	**142.3**	15.0	0.6	**15.6**	***157.9***
17885	**2004**	43.9	59.2	38.3	**141.4**	14.5	0.5	**14.9**	***156.3***
18250	**2005**	43.6	59.5	38.2	**141.2**	14.3	0.5	**14.8**	***156.0***
365	**2006**	44.6	60.1	38.1	**142.8**	14.2	0.4	**14.6**	***157.4***
1095	**2008**	46.5	62.0	37.1	**145.7**	12.8	0.2	**13.0**	***158.6***
1825	**2010**	47.6	63.7	37.0	**148.3**	12.2	0.1	**12.3**	***160.5***
2555	**2012**	53.7	64.5	36.9	**155.1**	11.4	0.1	**11.5**	***166.6***
3285	**2014**	56.4	65.3	36.9	**158.6**	11.0	0.0	**11.0**	***169.6***
4015	**2016**	58.0	66.0	36.9	**160.9**	10.7	0.0	**10.7**	***171.7***
Salinity (mg/L)		*27,000*	*41,000*	*23,000*		*8,000*	*8,000*		

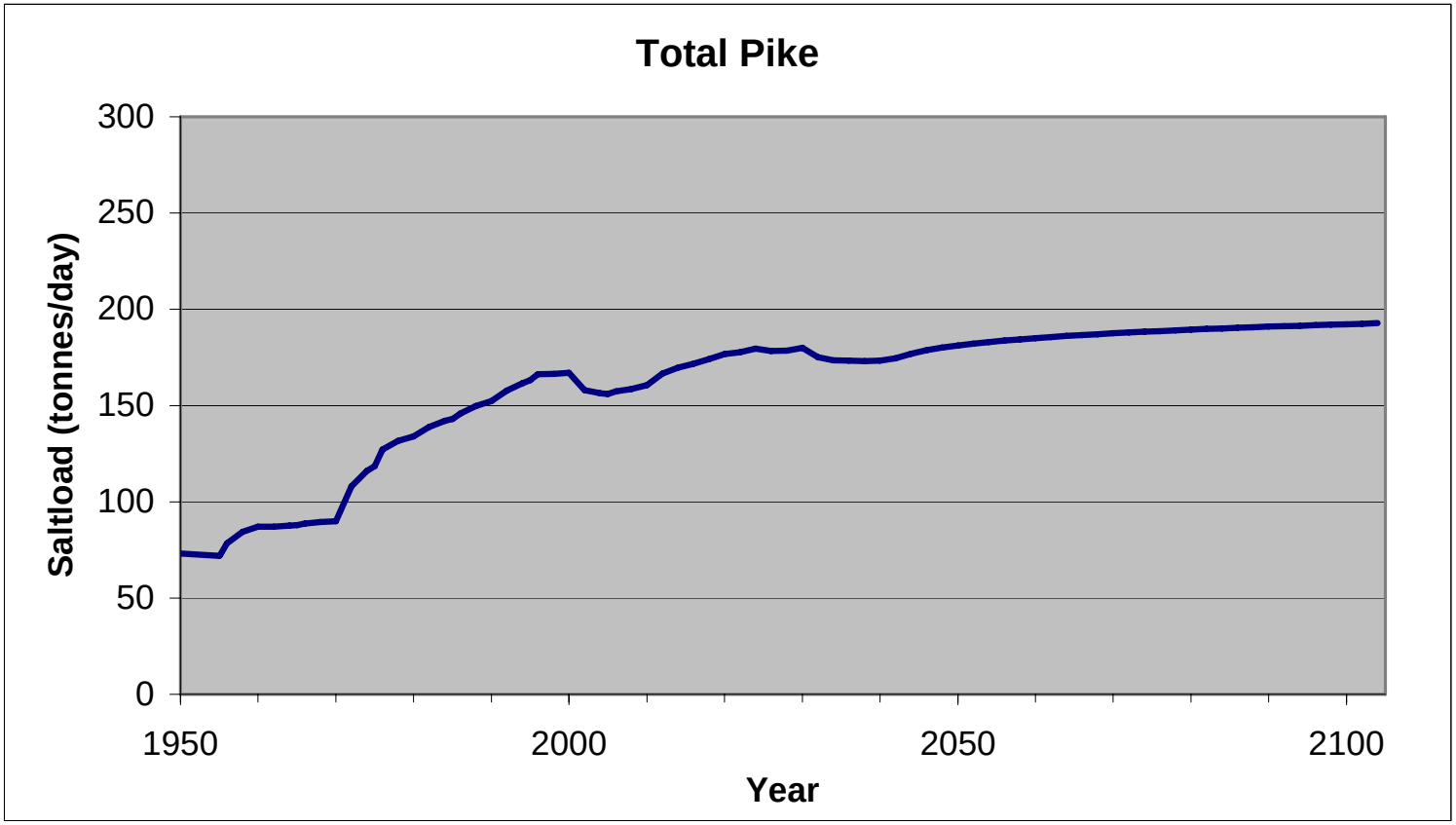
B-2 (S4-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	59.1	67.4	36.9	163.5	10.5	0.0	10.5	174.1
5475	2020	60.6	68.8	37.0	166.3	10.4	0.0	10.4	176.7
6205	2022	62.3	67.3	37.7	167.2	10.5	0.0	10.5	177.7
6935	2024	63.6	67.2	38.1	168.9	10.5	0.0	10.5	179.4
7665	2026	61.9	67.6	38.3	167.8	10.6	0.0	10.6	178.4
8395	2028	61.6	67.7	38.6	167.9	10.6	0.0	10.6	178.5
9125	2030	62.3	68.1	38.8	169.2	10.6	0.0	10.7	179.8
9855	2032	61.6	68.6	34.3	164.4	10.7	0.0	10.7	175.1
10585	2034	61.4	68.9	32.5	162.8	10.7	0.0	10.7	173.6
11315	2036	61.5	69.2	31.7	162.4	10.7	0.0	10.8	173.2
12045	2038	61.8	69.4	31.2	162.4	10.8	0.0	10.8	173.2
12775	2040	62.0	69.5	31.0	162.5	10.8	0.0	10.8	173.3
13505	2042	63.1	69.7	30.8	163.6	10.8	0.0	10.8	174.4
14235	2044	65.5	69.9	30.7	166.1	10.8	0.0	10.8	177.0
14965	2046	67.2	70.1	30.7	167.9	10.8	0.0	10.9	178.7
15695	2048	68.4	70.2	30.7	169.2	10.8	0.0	10.9	180.1
16425	2050	69.4	70.3	30.6	170.3	10.9	0.0	10.9	181.2
17155	2052	70.2	70.4	30.7	171.3	10.9	0.0	10.9	182.2
17885	2054	70.9	70.5	30.7	172.1	10.9	0.0	10.9	183.0
18615	2056	71.5	70.6	30.7	172.8	10.9	0.0	10.9	183.7
19345	2058	72.1	70.7	30.7	173.5	10.9	0.0	10.9	184.4
20075	2060	72.5	70.8	30.7	174.1	10.9	0.0	10.9	185.0
20805	2062	73.0	70.9	30.8	174.7	10.9	0.0	10.9	185.6
21535	2064	73.4	71.0	30.8	175.2	10.9	0.0	10.9	186.1
22265	2066	73.8	71.0	30.8	175.7	10.9	0.0	10.9	186.6
22995	2068	74.2	71.1	30.9	176.1	10.9	0.0	10.9	187.0
23725	2070	74.5	71.2	30.9	176.6	10.9	0.0	10.9	187.5
24455	2072	74.8	71.2	31.0	177.0	10.9	0.0	10.9	187.9
25185	2074	75.1	71.3	31.0	177.4	10.9	0.0	10.9	188.3
25915	2076	75.4	71.3	31.0	177.7	10.9	0.0	10.9	188.7
26645	2078	75.6	71.4	31.1	178.1	10.9	0.0	10.9	189.0
27375	2080	75.9	71.4	31.1	178.4	10.9	0.0	10.9	189.4
28105	2082	76.1	71.5	31.1	178.8	10.9	0.0	10.9	189.7
28835	2084	76.4	71.5	31.2	179.1	10.9	0.0	10.9	190.0
29565	2086	76.6	71.6	31.2	179.4	10.9	0.0	10.9	190.3
30295	2088	76.8	71.6	31.2	179.7	10.9	0.0	10.9	190.6
31025	2090	77.0	71.7	31.3	180.0	10.9	0.0	10.9	190.9
31755	2092	77.2	71.7	31.3	180.3	10.9	0.0	10.9	191.2
32485	2094	77.4	71.8	31.3	180.5	10.9	0.0	10.9	191.5
33215	2096	77.6	71.8	31.3	180.8	10.9	0.0	10.9	191.7
33945	2098	77.8	71.9	31.4	181.1	10.9	0.0	10.9	192.0
34675	2100	78.0	71.9	31.4	181.3	10.9	0.0	10.9	192.3
35405	2102	78.2	72.0	31.4	181.6	10.9	0.0	10.9	192.5
36135	2104	78.4	72.0	31.4	181.8	10.9	0.0	10.9	192.7
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

B-2 (S4-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Pike Area)



B-2 (S4-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-4 (Pike Area)



B-2 (S4-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-4 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		1169	546	380	***2095***	99	0	***99***	***2194***
365	**1886**	1169	546	380	***2095***	116	0	***116***	***2211***
18250	**1935**	1169	546	380	***2096***	202	0	***202***	***2298***
21900	**1945**	1169	547	381	***2096***	799	5	***804***	***2900***
23725	**1950**	1169	547	382	***2097***	1161	138	***1299***	***3396***
25550	**1955**	1169	547	382	***2098***	1059	92	***1151***	***3248***
30	**1955**	1169	548	387	***2104***	1067	92	***1159***	***3263***
365	**1956**	1178	629	427	***2234***	1272	109	***1381***	***3615***
1095	**1958**	1196	707	459	***2362***	1451	134	***1585***	***3947***
1825	**1960**	1206	738	474	***2417***	1519	143	***1661***	***4079***
2555	**1962**	1210	750	536	***2496***	1375	34	***1409***	***3906***
3285	**1964**	1213	759	554	***2525***	1355	21	***1376***	***3902***
3650	**1965**	1214	762	558	***2535***	1354	18	***1372***	***3907***
4015	**1966**	1216	777	562	***2555***	1354	17	***1371***	***3926***
4745	**1968**	1219	791	567	***2578***	1359	15	***1374***	***3951***
5475	**1970**	1222	799	571	***2592***	1364	14	***1378***	***3970***
6205	**1972**	1234	827	1251	***3311***	1472	32	***1503***	***4815***
6935	**1974**	1241	840	1542	***3623***	1535	47	***1582***	***5204***
7300	**1975**	1244	845	1628	***3717***	1554	53	***1607***	***5324***
7665	**1976**	1482	857	1693	***4033***	1569	56	***1626***	***5659***
8395	**1978**	1530	877	1783	***4190***	1590	61	***1651***	***5841***
9125	**1980**	1546	890	1845	***4281***	1603	64	***1667***	***5948***
9855	**1982**	1706	941	1792	***4439***	1579	53	***1632***	***6071***
10585	**1984**	1771	969	1793	***4532***	1606	51	***1657***	***6189***
10950	**1985**	1789	978	1798	***4566***	1619	52	***1670***	***6236***
11315	**1986**	1802	1026	1805	***4633***	1644	54	***1698***	***6330***
12045	**1988**	1821	1078	1822	***4721***	1739	67	***1806***	***6527***
12775	**1990**	1837	1105	1841	***4783***	1814	79	***1893***	***6676***
13505	**1992**	1880	1254	1734	***4868***	1864	87	***1951***	***6819***
14235	**1994**	1897	1330	1735	***4962***	1898	93	***1990***	***6952***
14600	**1995**	1904	1355	1745	***5005***	1911	95	***2006***	***7010***
14965	**1996**	1910	1365	1834	***5110***	1972	98	***2069***	***7179***
15695	**1998**	1919	1386	1776	***5081***	2022	106	***2128***	***7209***
16425	**2000**	1927	1404	1745	***5077***	2058	111	***2170***	***7247***
17155	**2002**	1667	1432	1679	***4778***	1876	71	***1947***	***6725***
17885	**2004**	1625	1445	1664	***4734***	1807	60	***1867***	***6601***
18250	**2005**	1616	1450	1659	***4725***	1788	57	***1845***	***6570***
365	**2006**	1652	1465	1657	***4773***	1775	55	***1829***	***6603***
1095	**2008**	1723	1513	1613	***4849***	1598	23	***1621***	***6470***
1825	**2010**	1762	1554	1607	***4923***	1522	12	***1534***	***6457***
2555	**2012**	1990	1573	1605	***5168***	1426	7	***1433***	***6601***
3285	**2014**	2089	1593	1605	***5286***	1372	5	***1377***	***6663***
4015	**2016**	2147	1611	1605	***5363***	1338	4	***1342***	***6705***

B-2 (S5-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-5 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	2190	1645	1606	5442	1315	3	1318	6760
5475	2020	2243	1677	1609	5529	1299	2	1301	6830
6205	2022	2306	1642	1639	5587	1312	1	1313	6900
6935	2024	2356	1640	1656	5652	1317	1	1318	6970
7665	2026	2294	1648	1669	5610	1323	1	1324	6934
8395	2028	2280	1652	1679	5611	1329	2	1331	6942
9125	2030	2307	1662	1689	5657	1335	2	1337	6994
9855	2032	2280	1673	1494	5447	1341	2	1343	6789
10585	2034	2274	1681	1419	5374	1345	2	1348	6721
11315	2036	2289	1712	1384	5385	1350	2	1352	6737
12045	2038	2307	1744	1366	5417	1353	2	1356	6773
12775	2040	2325	1766	1356	5447	1356	3	1359	6806
13505	2042	2372	1780	1351	5503	1359	3	1362	6865
14235	2044	2466	1792	1349	5608	1361	3	1364	6972
14965	2046	2530	1802	1351	5684	1363	3	1366	7050
15695	2048	2579	1812	1371	5762	1365	3	1368	7130
16425	2050	2618	1825	1409	5852	1367	3	1370	7222
17155	2052	2650	1839	1457	5946	1369	3	1372	7318
17885	2054	2678	1854	1505	6038	1370	3	1373	7411
18615	2056	2728	1869	1552	6148	1372	3	1375	7523
19345	2058	2800	1883	1594	6277	1373	3	1376	7653
20075	2060	2878	1896	1633	6406	1374	3	1377	7784
20805	2062	2953	1909	1668	6529	1375	3	1379	7908
21535	2064	3022	1920	1700	6641	1377	3	1380	8021
22265	2066	3091	1930	1729	6750	1378	3	1381	8130
22995	2068	3166	1940	1755	6861	1379	3	1382	8242
23725	2070	3239	1949	1779	6967	1380	3	1383	8349
24455	2072	3308	1958	1801	7066	1381	3	1384	8450
25185	2074	3374	1965	1821	7161	1381	3	1385	8545
25915	2076	3437	1973	1840	7250	1382	3	1386	8636
26645	2078	3497	1980	1858	7334	1383	3	1386	8721
27375	2080	3554	1986	1874	7414	1384	3	1387	8801
28105	2082	3608	1992	1889	7489	1385	3	1388	8877
28835	2084	3659	1998	1903	7560	1385	3	1389	8949
29565	2086	3708	2004	1916	7628	1386	3	1390	9017
30295	2088	3754	2009	1929	7692	1387	3	1390	9082
31025	2090	3798	2014	1940	7752	1388	3	1391	9143
31755	2092	3839	2019	1951	7809	1388	3	1392	9201
32485	2094	3878	2024	1962	7863	1389	3	1392	9256
33215	2096	3916	2028	1971	7915	1389	3	1393	9308
33945	2098	3951	2032	1980	7963	1390	4	1393	9357
34675	2100	3984	2036	1989	8009	1390	4	1394	9403
35405	2102	4015	2040	1997	8052	1391	4	1394	9447
36135	2104	4044	2044	2005	8093	1391	4	1395	9488

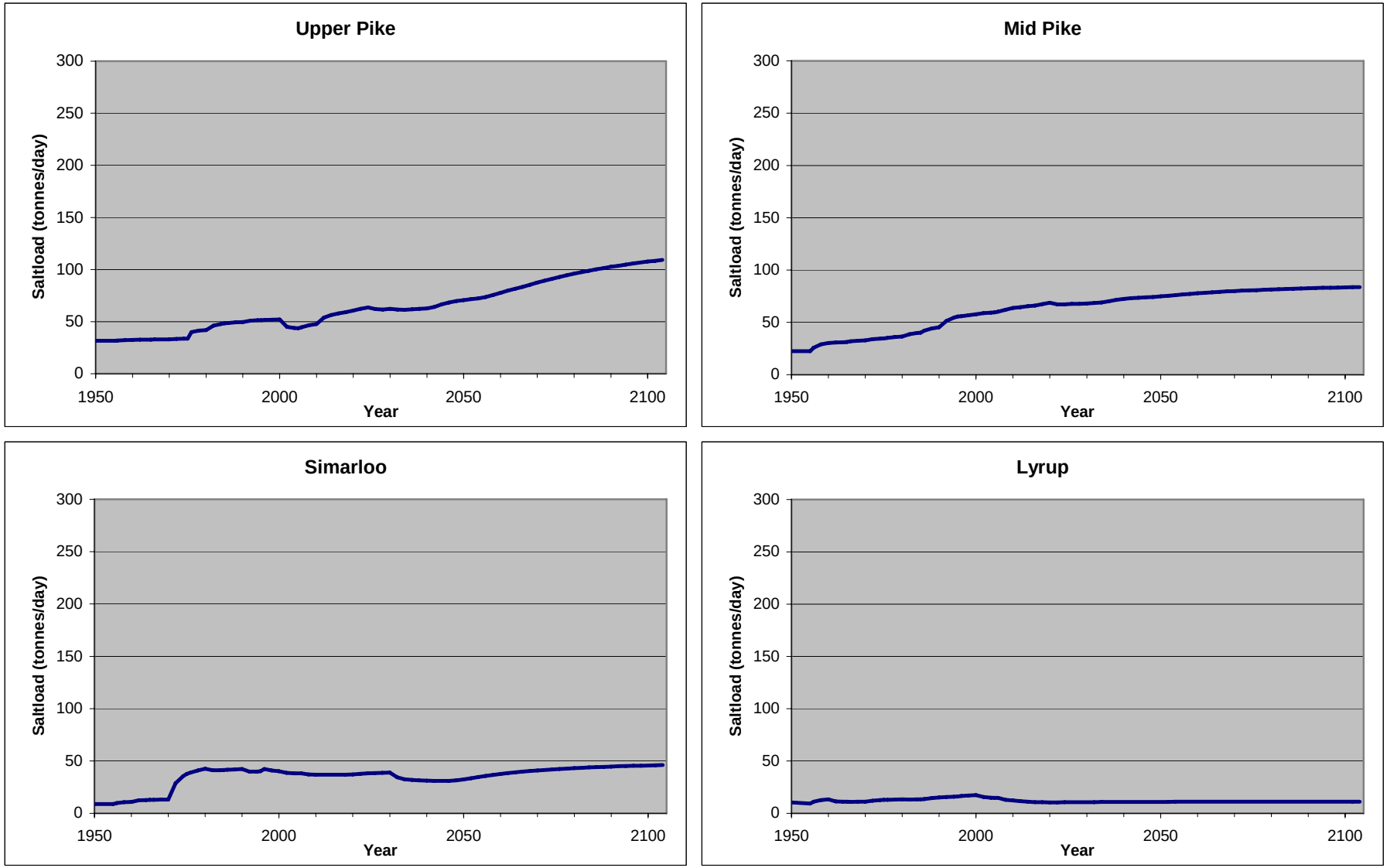
B-2 (S5-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-5 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		31.6	22.4	8.7	**62.7**	0.8	0.0	**0.8**	***63.5***
365	**1886**	31.6	22.4	8.7	**62.7**	0.9	0.0	**0.9**	***63.6***
18250	**1935**	31.6	22.4	8.7	**62.7**	1.6	0.0	**1.6**	***64.3***
21900	**1945**	31.6	22.4	8.8	**62.7**	6.4	0.0	**6.4**	***69.2***
23725	**1950**	31.6	22.4	8.8	**62.7**	9.3	1.1	**10.4**	***73.1***
25550	**1955**	31.6	22.4	8.8	**62.8**	8.5	0.7	**9.2**	***72.0***
30	**1955**	31.6	22.5	8.9	**62.9**	8.5	0.7	**9.3**	***72.2***
365	**1956**	31.8	25.8	9.8	**67.4**	10.2	0.9	**11.0**	***78.5***
1095	**1958**	32.3	29.0	10.6	**71.8**	11.6	1.1	**12.7**	***84.5***
1825	**1960**	32.6	30.3	10.9	**73.7**	12.2	1.1	**13.3**	***87.0***
2555	**1962**	32.7	30.8	12.3	**75.8**	11.0	0.3	**11.3**	***87.0***
3285	**1964**	32.7	31.1	12.7	**76.6**	10.8	0.2	**11.0**	***87.6***
3650	**1965**	32.8	31.2	12.8	**76.9**	10.8	0.1	**11.0**	***87.9***
4015	**1966**	32.8	31.9	12.9	**77.6**	10.8	0.1	**11.0**	***88.6***
4745	**1968**	32.9	32.4	13.0	**78.4**	10.9	0.1	**11.0**	***89.4***
5475	**1970**	33.0	32.8	13.1	**78.9**	10.9	0.1	**11.0**	***89.9***
6205	**1972**	33.3	33.9	28.8	**96.0**	11.8	0.3	**12.0**	***108.0***
6935	**1974**	33.5	34.4	35.5	**103.4**	12.3	0.4	**12.7**	***116.1***
7300	**1975**	33.6	34.6	37.5	**105.7**	12.4	0.4	**12.9**	***118.5***
7665	**1976**	40.0	35.2	38.9	**114.1**	12.6	0.5	**13.0**	***127.1***
8395	**1978**	41.3	35.9	41.0	**118.3**	12.7	0.5	**13.2**	***131.5***
9125	**1980**	41.8	36.5	42.4	**120.7**	12.8	0.5	**13.3**	***134.0***
9855	**1982**	46.1	38.6	41.2	**125.9**	12.6	0.4	**13.1**	***138.9***
10585	**1984**	47.8	39.7	41.2	**128.7**	12.8	0.4	**13.3**	***142.0***
10950	**1985**	48.3	40.1	41.4	**129.8**	12.9	0.4	**13.4**	***143.1***
11315	**1986**	48.7	42.1	41.5	**132.2**	13.2	0.4	**13.6**	***145.8***
12045	**1988**	49.2	44.2	41.9	**135.3**	13.9	0.5	**14.4**	***149.7***
12775	**1990**	49.6	45.3	42.3	**137.2**	14.5	0.6	**15.1**	***152.4***
13505	**1992**	50.8	51.4	39.9	**142.1**	14.9	0.7	**15.6**	***157.7***
14235	**1994**	51.2	54.5	39.9	**145.7**	15.2	0.7	**15.9**	***161.6***
14600	**1995**	51.4	55.6	40.1	**147.1**	15.3	0.8	**16.0**	***163.2***
14965	**1996**	51.6	56.0	42.2	**149.7**	15.8	0.8	**16.6**	***166.3***
15695	**1998**	51.8	56.8	40.9	**149.5**	16.2	0.8	**17.0**	***166.5***
16425	**2000**	52.0	57.6	40.1	**149.8**	16.5	0.9	**17.4**	***167.1***
17155	**2002**	45.0	58.7	38.6	**142.3**	15.0	0.6	**15.6**	***157.9***
17885	**2004**	43.9	59.2	38.3	**141.4**	14.5	0.5	**14.9**	***156.3***
18250	**2005**	43.6	59.5	38.2	**141.2**	14.3	0.5	**14.8**	***156.0***
365	**2006**	44.6	60.1	38.1	**142.8**	14.2	0.4	**14.6**	***157.4***
1095	**2008**	46.5	62.0	37.1	**145.7**	12.8	0.2	**13.0**	***158.6***
1825	**2010**	47.6	63.7	37.0	**148.3**	12.2	0.1	**12.3**	***160.5***
2555	**2012**	53.7	64.5	36.9	**155.1**	11.4	0.1	**11.5**	***166.6***
3285	**2014**	56.4	65.3	36.9	**158.6**	11.0	0.0	**11.0**	***169.6***
4015	**2016**	58.0	66.0	36.9	**160.9**	10.7	0.0	**10.7**	***171.7***
Salinity (mg/L)		*27,000*	*41,000*	*23,000*		*8,000*	*8,000*		

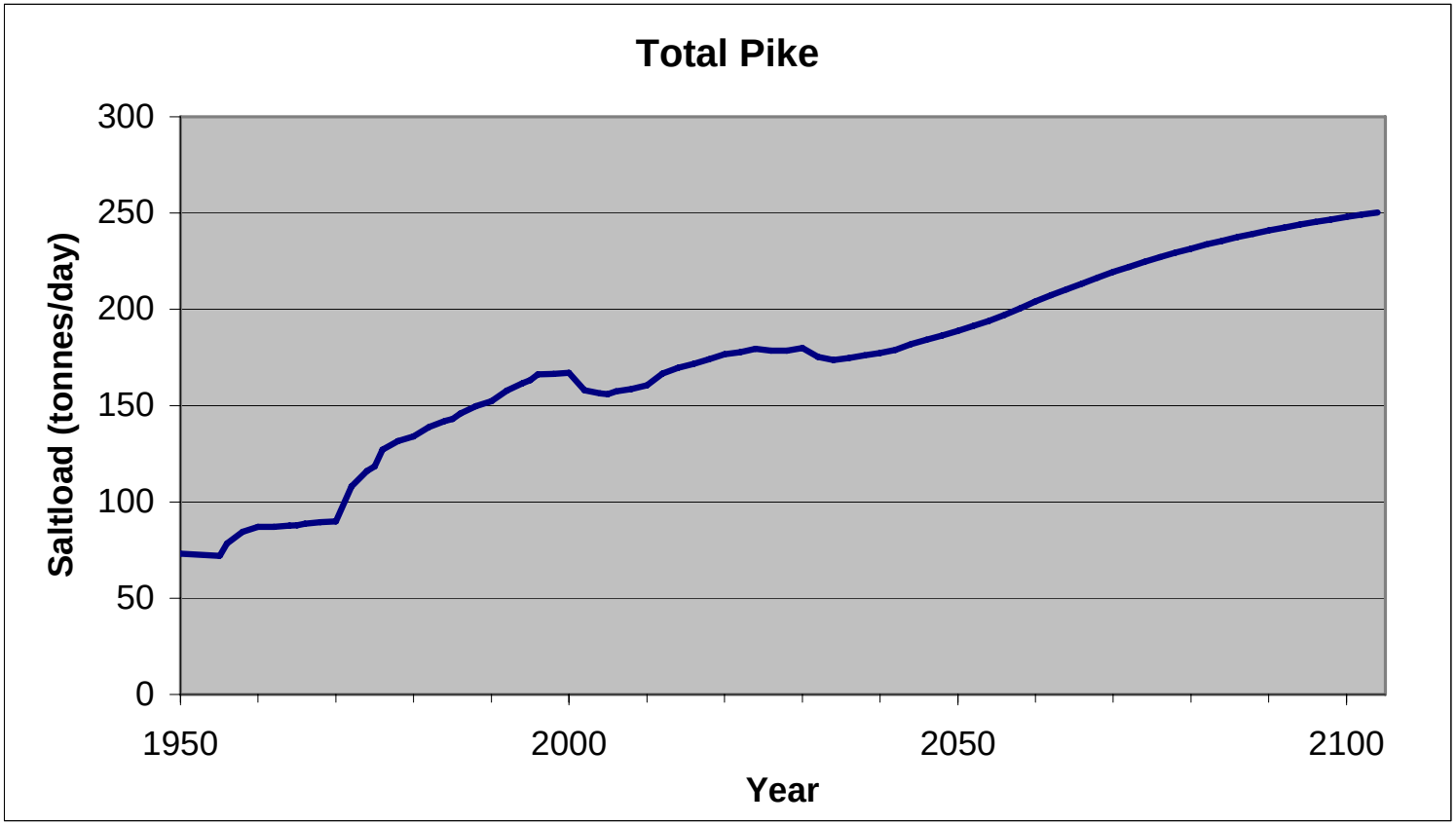
B-2 (S5-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	59.1	67.4	36.9	163.5	10.5	0.0	10.5	174.1
5475	2020	60.6	68.8	37.0	166.3	10.4	0.0	10.4	176.7
6205	2022	62.3	67.3	37.7	167.3	10.5	0.0	10.5	177.8
6935	2024	63.6	67.2	38.1	168.9	10.5	0.0	10.5	179.5
7665	2026	61.9	67.6	38.4	167.9	10.6	0.0	10.6	178.5
8395	2028	61.6	67.7	38.6	167.9	10.6	0.0	10.6	178.6
9125	2030	62.3	68.2	38.8	169.3	10.7	0.0	10.7	180.0
9855	2032	61.6	68.6	34.4	164.5	10.7	0.0	10.7	175.2
10585	2034	61.4	68.9	32.6	163.0	10.8	0.0	10.8	173.7
11315	2036	61.8	70.2	31.8	163.8	10.8	0.0	10.8	174.6
12045	2038	62.3	71.5	31.4	165.2	10.8	0.0	10.8	176.1
12775	2040	62.8	72.4	31.2	166.4	10.9	0.0	10.9	177.2
13505	2042	64.0	73.0	31.1	168.1	10.9	0.0	10.9	179.0
14235	2044	66.6	73.5	31.0	171.1	10.9	0.0	10.9	182.0
14965	2046	68.3	73.9	31.1	173.3	10.9	0.0	10.9	184.2
15695	2048	69.6	74.3	31.5	175.5	10.9	0.0	10.9	186.4
16425	2050	70.7	74.8	32.4	177.9	10.9	0.0	11.0	188.9
17155	2052	71.6	75.4	33.5	180.5	10.9	0.0	11.0	191.4
17885	2054	72.3	76.0	34.6	182.9	11.0	0.0	11.0	193.9
18615	2056	73.7	76.6	35.7	186.0	11.0	0.0	11.0	197.0
19345	2058	75.6	77.2	36.7	189.5	11.0	0.0	11.0	200.5
20075	2060	77.7	77.7	37.6	193.0	11.0	0.0	11.0	204.0
20805	2062	79.7	78.2	38.4	196.3	11.0	0.0	11.0	207.4
21535	2064	81.6	78.7	39.1	199.4	11.0	0.0	11.0	210.4
22265	2066	83.4	79.1	39.8	202.4	11.0	0.0	11.0	213.4
22995	2068	85.5	79.5	40.4	205.4	11.0	0.0	11.1	216.4
23725	2070	87.4	79.9	40.9	208.3	11.0	0.0	11.1	219.3
24455	2072	89.3	80.3	41.4	211.0	11.0	0.0	11.1	222.1
25185	2074	91.1	80.6	41.9	213.6	11.1	0.0	11.1	224.6
25915	2076	92.8	80.9	42.3	216.0	11.1	0.0	11.1	227.1
26645	2078	94.4	81.2	42.7	218.3	11.1	0.0	11.1	229.4
27375	2080	96.0	81.4	43.1	220.5	11.1	0.0	11.1	231.6
28105	2082	97.4	81.7	43.4	222.5	11.1	0.0	11.1	233.6
28835	2084	98.8	81.9	43.8	224.5	11.1	0.0	11.1	235.6
29565	2086	100.1	82.1	44.1	226.3	11.1	0.0	11.1	237.4
30295	2088	101.4	82.4	44.4	228.1	11.1	0.0	11.1	239.2
31025	2090	102.5	82.6	44.6	229.7	11.1	0.0	11.1	240.9
31755	2092	103.7	82.8	44.9	231.3	11.1	0.0	11.1	242.4
32485	2094	104.7	83.0	45.1	232.8	11.1	0.0	11.1	243.9
33215	2096	105.7	83.1	45.3	234.2	11.1	0.0	11.1	245.3
33945	2098	106.7	83.3	45.5	235.5	11.1	0.0	11.1	246.7
34675	2100	107.6	83.5	45.7	236.8	11.1	0.0	11.2	247.9
35405	2102	108.4	83.6	45.9	238.0	11.1	0.0	11.2	249.1
36135	2104	109.2	83.8	46.1	239.1	11.1	0.0	11.2	250.3
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

B-2 (S5-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Pike Area)



B-2 (S5-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-5 (Pike Area)



B-2 (S5-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-5 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		1169	546	380	***2095***	99	0	***99***	***2194***
365	**1886**	1169	546	380	***2095***	116	0	***116***	***2211***
18250	**1935**	1169	546	380	***2096***	202	0	***202***	***2298***
21900	**1945**	1169	547	381	***2096***	799	5	***804***	***2900***
23725	**1950**	1169	547	382	***2097***	1161	138	***1299***	***3396***
25550	**1955**	1169	547	382	***2098***	1059	92	***1151***	***3248***
30	**1955**	1169	548	387	***2104***	1067	92	***1159***	***3263***
365	**1956**	1178	629	427	***2234***	1272	109	***1381***	***3615***
1095	**1958**	1196	707	459	***2362***	1451	134	***1585***	***3947***
1825	**1960**	1206	738	474	***2417***	1519	143	***1661***	***4079***
2555	**1962**	1210	750	536	***2496***	1375	34	***1409***	***3906***
3285	**1964**	1213	759	554	***2525***	1355	21	***1376***	***3902***
3650	**1965**	1214	762	558	***2535***	1354	18	***1372***	***3907***
4015	**1966**	1216	777	562	***2555***	1354	17	***1371***	***3926***
4745	**1968**	1219	791	567	***2578***	1359	15	***1374***	***3951***
5475	**1970**	1222	799	571	***2592***	1364	14	***1378***	***3970***
6205	**1972**	1234	827	1251	***3311***	1472	32	***1503***	***4815***
6935	**1974**	1241	840	1542	***3623***	1535	47	***1582***	***5204***
7300	**1975**	1244	845	1628	***3717***	1554	53	***1607***	***5324***
7665	**1976**	1482	857	1693	***4033***	1569	56	***1626***	***5659***
8395	**1978**	1530	877	1783	***4190***	1590	61	***1651***	***5841***
9125	**1980**	1546	890	1845	***4281***	1603	64	***1667***	***5948***
9855	**1982**	1706	941	1792	***4439***	1579	53	***1632***	***6071***
10585	**1984**	1771	969	1793	***4532***	1606	51	***1657***	***6189***
10950	**1985**	1789	978	1798	***4566***	1619	52	***1670***	***6236***
11315	**1986**	1802	1026	1805	***4633***	1644	54	***1698***	***6330***
12045	**1988**	1821	1078	1822	***4721***	1739	67	***1806***	***6527***
12775	**1990**	1837	1105	1841	***4783***	1814	79	***1893***	***6676***
13505	**1992**	1880	1254	1734	***4868***	1864	87	***1951***	***6819***
14235	**1994**	1897	1330	1735	***4962***	1898	93	***1990***	***6952***
14600	**1995**	1904	1355	1745	***5005***	1911	95	***2006***	***7010***
14965	**1996**	1910	1365	1834	***5110***	1972	98	***2069***	***7179***
15695	**1998**	1919	1386	1776	***5081***	2022	106	***2128***	***7209***
16425	**2000**	1927	1404	1745	***5077***	2058	111	***2170***	***7247***
17155	**2002**	1667	1432	1679	***4778***	1876	71	***1947***	***6725***
17885	**2004**	1625	1445	1664	***4734***	1807	60	***1867***	***6601***
18250	**2005**	1616	1450	1659	***4725***	1788	57	***1845***	***6570***
365	**2006**	955	585	986	***2526***	825	0	***825***	***3351***
1095	**2008**	943	544	784	***2271***	666	0	***666***	***2937***
1825	**2010**	946	542	749	***2237***	622	0	***622***	***2859***
2555	**2012**	1065	538	733	***2337***	554	0	***554***	***2891***
3285	**2014**	1120	540	723	***2383***	518	0	***518***	***2901***
4015	**2016**	1150	544	716	***2409***	496	0	***496***	***2905***
4745	**2018**	1169	556	711	***2436***	481	0	***481***	***2917***

B-2 (S6-1). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-6 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
5475	2020	1194	566	708	2468	470	0	470	2939
6205	2022	985	552	726	2263	483	0	483	2746
6935	2024	996	552	733	2281	487	0	487	2768
7665	2026	962	555	739	2255	491	0	491	2746
8395	2028	953	557	743	2253	495	0	495	2748
9125	2030	962	561	747	2270	499	0	499	2770
9855	2032	950	564	631	2145	503	0	503	2648
10585	2034	946	567	602	2116	506	0	506	2622
10950	2035	948	573	596	2116	508	0	508	2624
11315	2036	951	487	519	1957	509	0	509	2466
12045	2038	956	496	513	1965	512	0	512	2477
12775	2040	961	503	511	1976	514	0	514	2489
13505	2042	867	508	510	1885	515	0	515	2401
14235	2044	895	513	510	1918	517	0	517	2435
14965	2046	915	516	512	1943	518	0	518	2461
15695	2048	930	519	521	1970	520	0	520	2490
16425	2050	942	523	536	2002	521	0	521	2523
17155	2052	835	528	414	1777	522	0	522	2299
17885	2054	839	533	424	1797	523	0	523	2320
18615	2056	851	538	437	1826	524	0	524	2350
19345	2058	870	543	448	1861	525	0	525	2385
20075	2060	891	547	459	1897	526	0	526	2423
20805	2062	912	551	469	1932	526	0	526	2459
21535	2064	931	556	479	1965	527	0	527	2492
22265	2066	950	559	487	1996	528	0	528	2524
22995	2068	970	563	495	2029	529	0	529	2557
23725	2070	990	566	503	2059	529	0	529	2588
24455	2072	1009	569	510	2088	530	0	530	2618
25185	2074	1026	572	517	2115	530	0	530	2646
25915	2076	1044	575	523	2142	531	0	531	2673
26645	2078	1061	577	529	2167	532	0	532	2699
27375	2080	1076	580	534	2191	532	0	532	2723
28105	2082	1091	582	540	2213	533	0	533	2745
28835	2084	1105	584	545	2234	533	0	533	2767
29565	2086	1119	586	549	2254	534	0	534	2787
30295	2088	1131	588	554	2272	534	0	534	2807
31025	2090	1143	590	558	2290	535	0	535	2825
31755	2092	1154	592	562	2307	535	0	535	2842
32485	2094	1164	593	565	2323	535	0	535	2858
33215	2096	1174	595	569	2338	536	0	536	2873
33945	2098	1183	596	572	2352	536	0	536	2888
34675	2100	1192	598	575	2365	537	0	537	2902
35405	2102	1200	599	578	2378	537	0	537	2915
36135	2104	1208	601	581	2390	537	0	537	2927

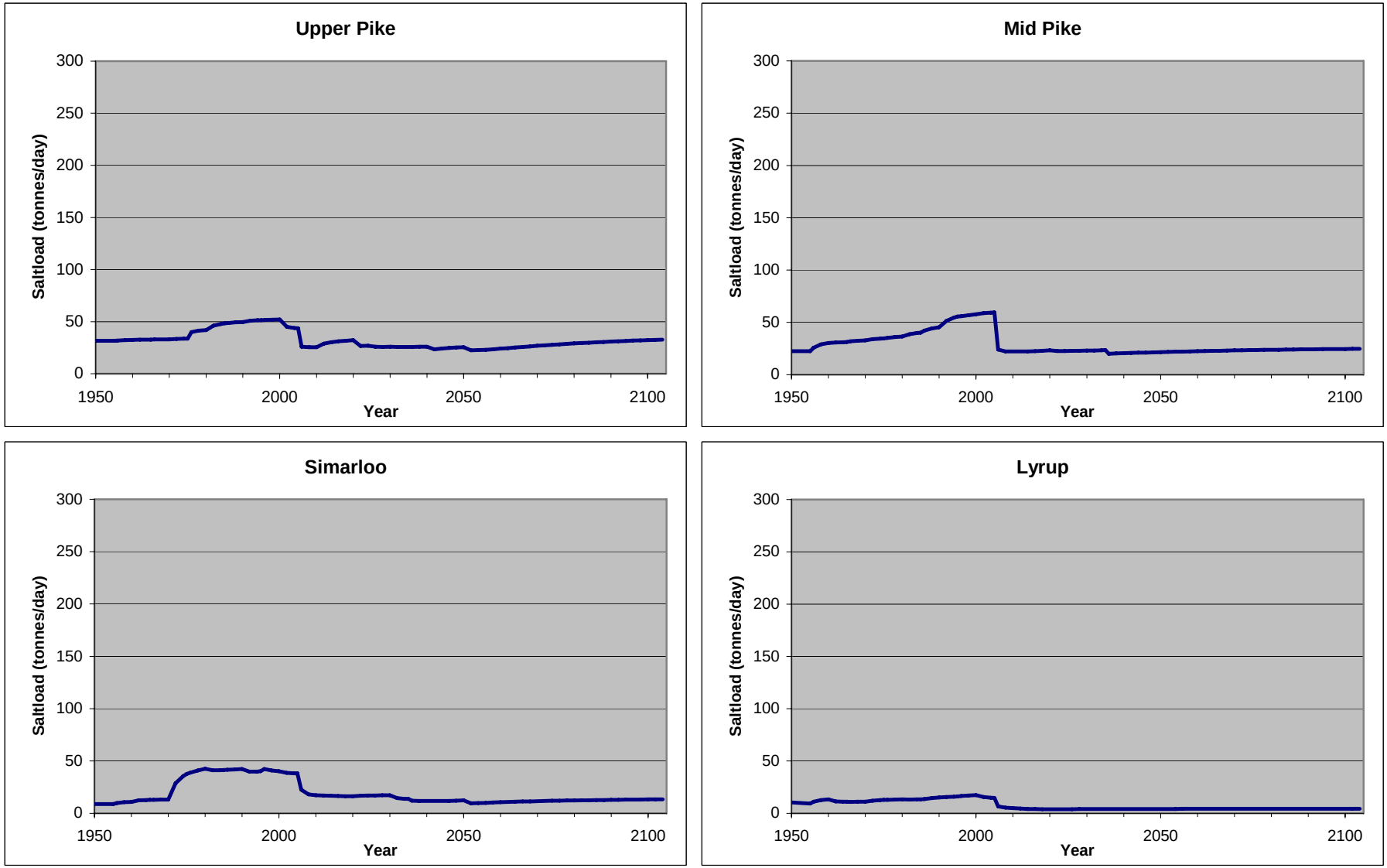
B-2 (S6-2). Modelled groundwater flux (m^3/day) from flow budget zones in Scenario-6 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
Steady State		31.6	22.4	8.7	**62.7**	0.8	0.0	**0.8**	***63.5***
365	**1886**	31.6	22.4	8.7	**62.7**	0.9	0.0	**0.9**	***63.6***
18250	**1935**	31.6	22.4	8.7	**62.7**	1.6	0.0	**1.6**	***64.3***
21900	**1945**	31.6	22.4	8.8	**62.7**	6.4	0.0	**6.4**	***69.2***
23725	**1950**	31.6	22.4	8.8	**62.7**	9.3	1.1	**10.4**	***73.1***
25550	**1955**	31.6	22.4	8.8	**62.8**	8.5	0.7	**9.2**	***72.0***
30	**1955**	31.6	22.5	8.9	**62.9**	8.5	0.7	**9.3**	***72.2***
365	**1956**	31.8	25.8	9.8	**67.4**	10.2	0.9	**11.0**	***78.5***
1095	**1958**	32.3	29.0	10.6	**71.8**	11.6	1.1	**12.7**	***84.5***
1825	**1960**	32.6	30.3	10.9	**73.7**	12.2	1.1	**13.3**	***87.0***
2555	**1962**	32.7	30.8	12.3	**75.8**	11.0	0.3	**11.3**	***87.0***
3285	**1964**	32.7	31.1	12.7	**76.6**	10.8	0.2	**11.0**	***87.6***
3650	**1965**	32.8	31.2	12.8	**76.9**	10.8	0.1	**11.0**	***87.9***
4015	**1966**	32.8	31.9	12.9	**77.6**	10.8	0.1	**11.0**	***88.6***
4745	**1968**	32.9	32.4	13.0	**78.4**	10.9	0.1	**11.0**	***89.4***
5475	**1970**	33.0	32.8	13.1	**78.9**	10.9	0.1	**11.0**	***89.9***
6205	**1972**	33.3	33.9	28.8	**96.0**	11.8	0.3	**12.0**	***108.0***
6935	**1974**	33.5	34.4	35.5	**103.4**	12.3	0.4	**12.7**	***116.1***
7300	**1975**	33.6	34.6	37.5	**105.7**	12.4	0.4	**12.9**	***118.5***
7665	**1976**	40.0	35.2	38.9	**114.1**	12.6	0.5	**13.0**	***127.1***
8395	**1978**	41.3	35.9	41.0	**118.3**	12.7	0.5	**13.2**	***131.5***
9125	**1980**	41.8	36.5	42.4	**120.7**	12.8	0.5	**13.3**	***134.0***
9855	**1982**	46.1	38.6	41.2	**125.9**	12.6	0.4	**13.1**	***138.9***
10585	**1984**	47.8	39.7	41.2	**128.7**	12.8	0.4	**13.3**	***142.0***
10950	**1985**	48.3	40.1	41.4	**129.8**	12.9	0.4	**13.4**	***143.1***
11315	**1986**	48.7	42.1	41.5	**132.2**	13.2	0.4	**13.6**	***145.8***
12045	**1988**	49.2	44.2	41.9	**135.3**	13.9	0.5	**14.4**	***149.7***
12775	**1990**	49.6	45.3	42.3	**137.2**	14.5	0.6	**15.1**	***152.4***
13505	**1992**	50.8	51.4	39.9	**142.1**	14.9	0.7	**15.6**	***157.7***
14235	**1994**	51.2	54.5	39.9	**145.7**	15.2	0.7	**15.9**	***161.6***
14600	**1995**	51.4	55.6	40.1	**147.1**	15.3	0.8	**16.0**	***163.2***
14965	**1996**	51.6	56.0	42.2	**149.7**	15.8	0.8	**16.6**	***166.3***
15695	**1998**	51.8	56.8	40.9	**149.5**	16.2	0.8	**17.0**	***166.5***
16425	**2000**	52.0	57.6	40.1	**149.8**	16.5	0.9	**17.4**	***167.1***
17155	**2002**	45.0	58.7	38.6	**142.3**	15.0	0.6	**15.6**	***157.9***
17885	**2004**	43.9	59.2	38.3	**141.4**	14.5	0.5	**14.9**	***156.3***
18250	**2005**	43.6	59.5	38.2	**141.2**	14.3	0.5	**14.8**	***156.0***
365	**2006**	25.8	24.0	22.7	**72.5**	6.6	0.0	**6.6**	***79.0***
1095	**2008**	25.5	22.3	18.0	**65.8**	5.3	0.0	**5.3**	***71.1***
1825	**2010**	25.5	22.2	17.2	**65.0**	5.0	0.0	**5.0**	***70.0***
2555	**2012**	28.8	22.1	16.9	**67.7**	4.4	0.0	**4.4**	***72.1***
3285	**2014**	30.2	22.2	16.6	**69.0**	4.1	0.0	**4.1**	***73.2***
4015	**2016**	31.0	22.3	16.5	**69.8**	4.0	0.0	**4.0**	***73.8***
Salinity (mg/L)		*27,000*	*41,000*	*23,000*		*8,000*	*8,000*		

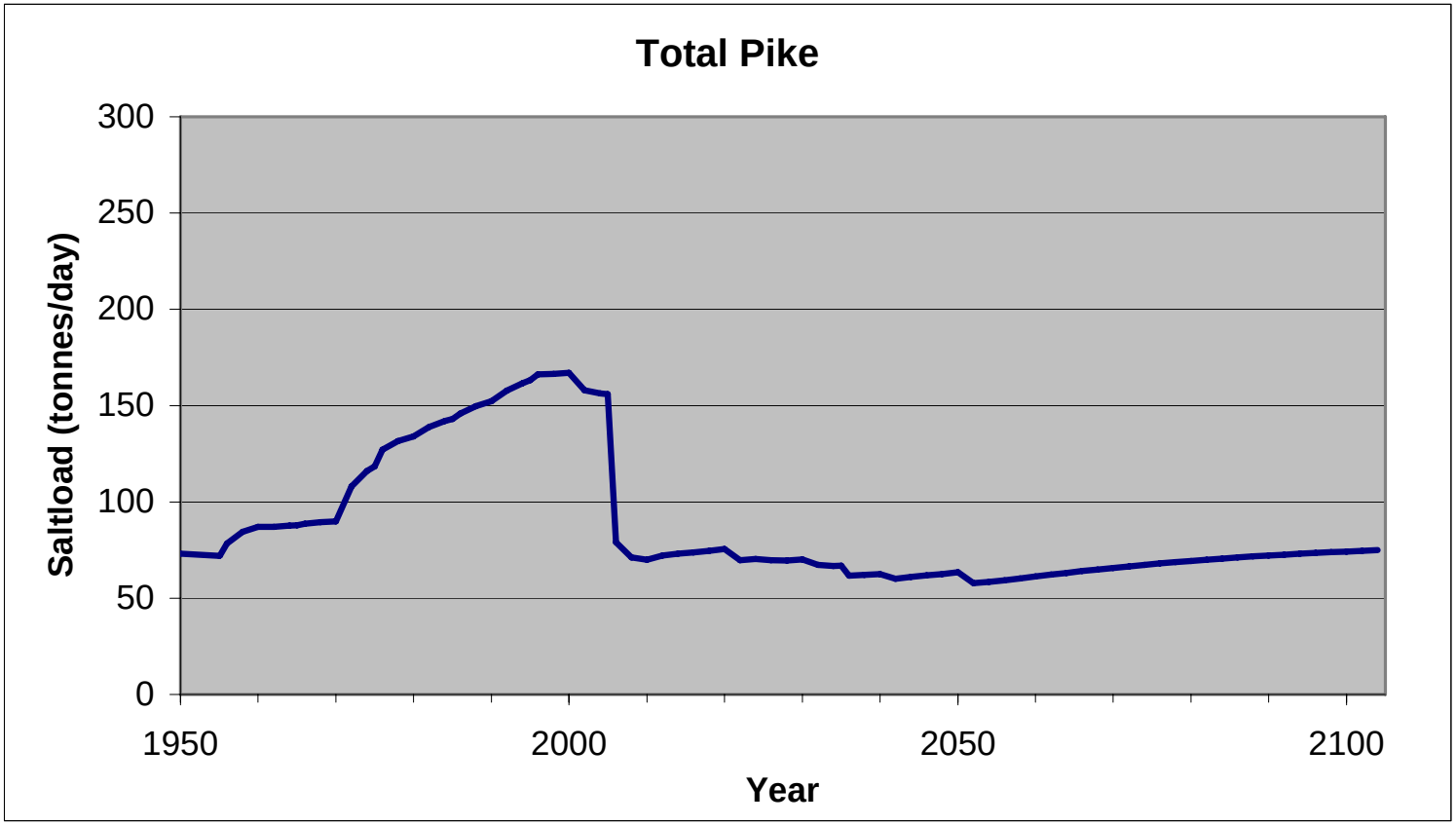
B-2 (S6-3). Modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Pike Area)

Day	Year	Upper Pike	Mid Pike	Simarloo	Pike River TOTAL	Lyrup		Lyrup TOTAL	PIKE TOTAL
		Z1 to Z7	Z1 to Z8	Z1 to Z9		Z1 to Z10	Z52 Drain		
4745	2018	31.6	22.8	16.4	70.7	3.8	0.0	3.8	74.6
5475	2020	32.2	23.2	16.3	71.7	3.8	0.0	3.8	75.5
6205	2022	26.6	22.6	16.7	65.9	3.9	0.0	3.9	69.8
6935	2024	26.9	22.6	16.9	66.4	3.9	0.0	3.9	70.3
7665	2026	26.0	22.8	17.0	65.7	3.9	0.0	3.9	69.6
8395	2028	25.7	22.8	17.1	65.6	4.0	0.0	4.0	69.6
9125	2030	26.0	23.0	17.2	66.2	4.0	0.0	4.0	70.1
9855	2032	25.6	23.1	14.5	63.3	4.0	0.0	4.0	67.3
10585	2034	25.6	23.3	13.9	62.7	4.1	0.0	4.1	66.7
10950	2035	25.6	23.5	13.7	62.8	4.1	0.0	4.1	66.8
11315	2036	25.7	20.0	11.9	57.6	4.1	0.0	4.1	61.6
12045	2038	25.8	20.3	11.8	58.0	4.1	0.0	4.1	62.1
12775	2040	26.0	20.6	11.8	58.3	4.1	0.0	4.1	62.5
13505	2042	23.4	20.8	11.7	56.0	4.1	0.0	4.1	60.1
14235	2044	24.2	21.0	11.7	56.9	4.1	0.0	4.1	61.0
14965	2046	24.7	21.1	11.8	57.6	4.1	0.0	4.1	61.8
15695	2048	25.1	21.3	12.0	58.4	4.2	0.0	4.2	62.5
16425	2050	25.4	21.5	12.3	59.2	4.2	0.0	4.2	63.4
17155	2052	22.5	21.6	9.5	53.7	4.2	0.0	4.2	57.9
17885	2054	22.7	21.8	9.8	54.3	4.2	0.0	4.2	58.5
18615	2056	23.0	22.0	10.0	55.1	4.2	0.0	4.2	59.3
19345	2058	23.5	22.2	10.3	56.0	4.2	0.0	4.2	60.2
20075	2060	24.1	22.4	10.6	57.0	4.2	0.0	4.2	61.2
20805	2062	24.6	22.6	10.8	58.0	4.2	0.0	4.2	62.2
21535	2064	25.1	22.8	11.0	58.9	4.2	0.0	4.2	63.1
22265	2066	25.6	22.9	11.2	59.8	4.2	0.0	4.2	64.0
22995	2068	26.2	23.1	11.4	60.7	4.2	0.0	4.2	64.9
23725	2070	26.7	23.2	11.6	61.5	4.2	0.0	4.2	65.7
24455	2072	27.2	23.3	11.7	62.3	4.2	0.0	4.2	66.5
25185	2074	27.7	23.5	11.9	63.1	4.2	0.0	4.2	67.3
25915	2076	28.2	23.6	12.0	63.8	4.2	0.0	4.2	68.0
26645	2078	28.6	23.7	12.2	64.5	4.3	0.0	4.3	68.7
27375	2080	29.1	23.8	12.3	65.1	4.3	0.0	4.3	69.4
28105	2082	29.5	23.9	12.4	65.7	4.3	0.0	4.3	70.0
28835	2084	29.8	23.9	12.5	66.3	4.3	0.0	4.3	70.6
29565	2086	30.2	24.0	12.6	66.9	4.3	0.0	4.3	71.1
30295	2088	30.5	24.1	12.7	67.4	4.3	0.0	4.3	71.6
31025	2090	30.9	24.2	12.8	67.9	4.3	0.0	4.3	72.1
31755	2092	31.1	24.3	12.9	68.3	4.3	0.0	4.3	72.6
32485	2094	31.4	24.3	13.0	68.8	4.3	0.0	4.3	73.0
33215	2096	31.7	24.4	13.1	69.2	4.3	0.0	4.3	73.5
33945	2098	31.9	24.5	13.2	69.6	4.3	0.0	4.3	73.8
34675	2100	32.2	24.5	13.2	69.9	4.3	0.0	4.3	74.2
35405	2102	32.4	24.6	13.3	70.3	4.3	0.0	4.3	74.6
36135	2104	32.6	24.6	13.4	70.6	4.3	0.0	4.3	74.9
Salinity (mg/L)		27,000	41,000	23,000		8,000	8,000		

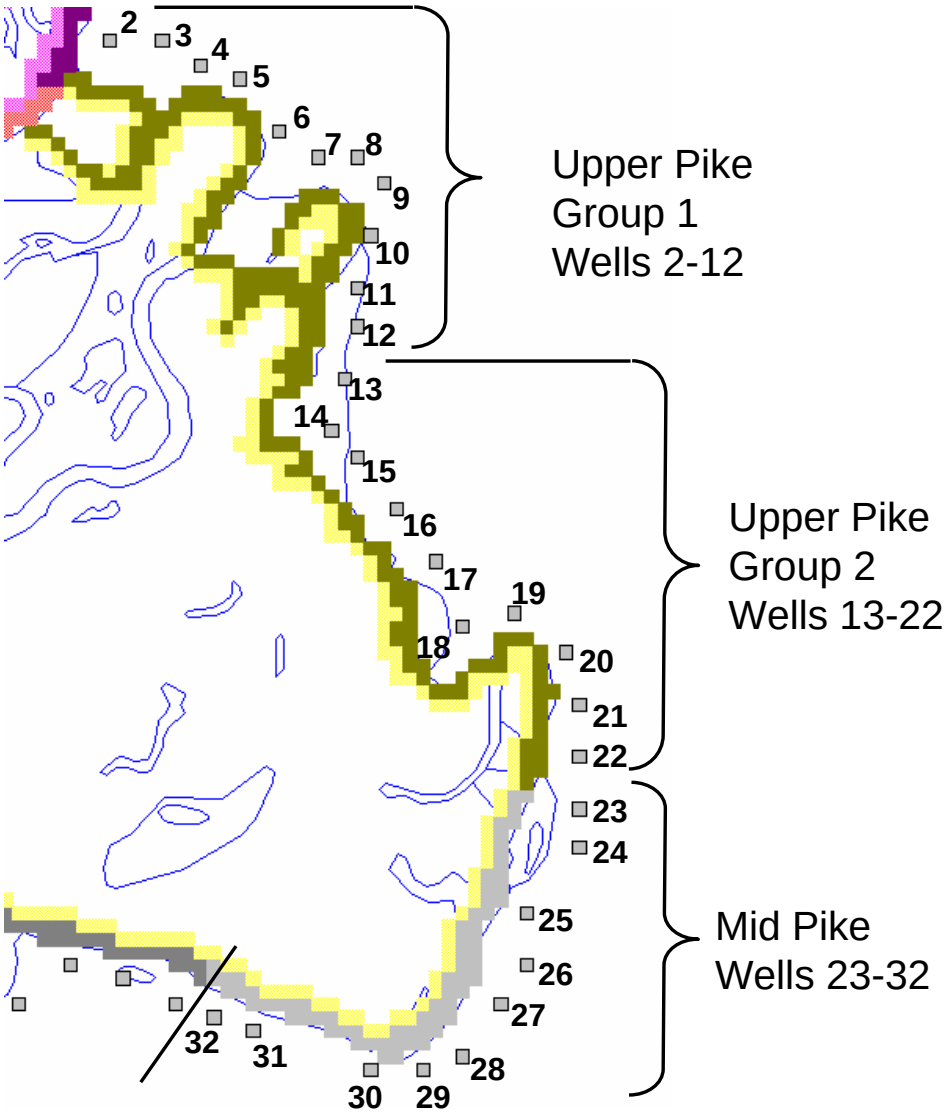
B-2 (S6-4). Modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Pike Area)



B-2 (S6-5). Graphs of modelled salt loads (tonnes/day) entering the River Murray in Scenario-6 (Pike Area)



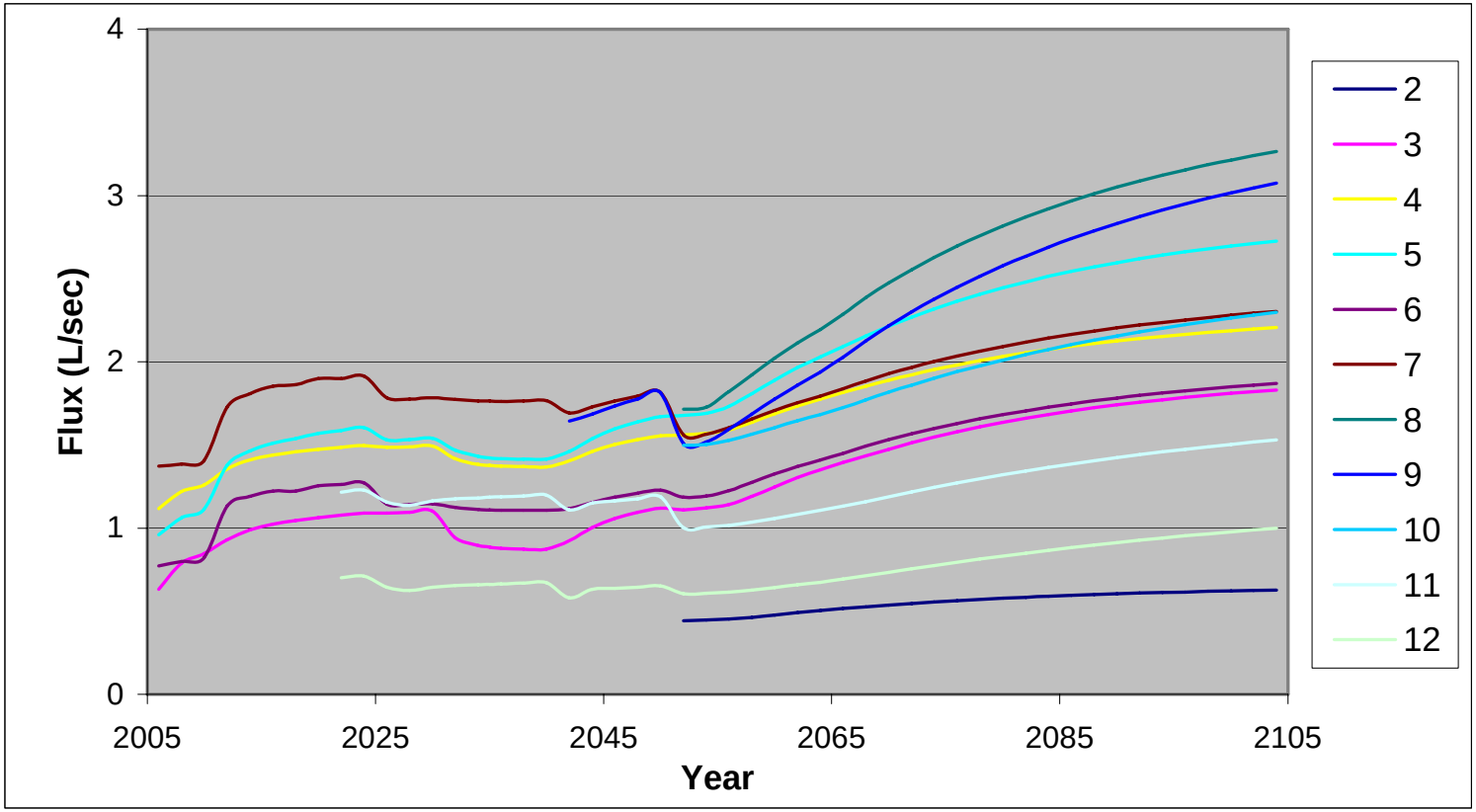
B-2 (S6-6). Graph of total modelled salt load (tonnes/day) entering the River Murray in Scenario-6 (Pike Area)



B-2 (S6-7). Pike concept SIS wells in the Upper and Mid Pike Areas (Scenario-6)

	SIS well #											
Year	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total**
2006		0.6	1.1	1.0	0.8	1.4						**4.9**
2008		0.8	1.2	1.1	0.8	1.4						**5.3**
2010		0.8	1.3	1.1	0.8	1.4						**5.5**
2012		0.9	1.4	1.4	1.1	1.7						**6.5**
2014		1.0	1.4	1.5	1.2	1.8						**6.9**
2016		1.0	1.4	1.5	1.2	1.9						**7.0**
2018		1.0	1.5	1.5	1.2	1.9						**7.1**
2020		1.1	1.5	1.6	1.3	1.9						**7.3**
2022		1.1	1.5	1.6	1.3	1.9				1.2	0.7	**9.2**
2024		1.1	1.5	1.6	1.3	1.9				1.2	0.7	**9.3**
2026		1.1	1.5	1.5	1.1	1.8				1.2	0.6	**8.8**
2028		1.1	1.5	1.5	1.1	1.8				1.1	0.6	**8.8**
2030		1.1	1.5	1.5	1.1	1.8				1.2	0.6	**8.9**
2032		0.9	1.4	1.5	1.1	1.8				1.2	0.7	**8.6**
2034		0.9	1.4	1.4	1.1	1.8				1.2	0.7	**8.4**
2035		0.9	1.4	1.4	1.1	1.8				1.2	0.7	**8.4**
2036		0.9	1.4	1.4	1.1	1.8				1.2	0.7	**8.4**
2038		0.9	1.4	1.4	1.1	1.8				1.2	0.7	**8.4**
2040		0.9	1.4	1.4	1.1	1.8				1.2	0.7	**8.4**
2042		0.9	1.4	1.5	1.1	1.7		1.6		1.1	0.6	**9.9**
2044		1.0	1.5	1.5	1.2	1.7		1.7		1.2	0.6	**10.4**
2046		1.1	1.5	1.6	1.2	1.8		1.7		1.2	0.6	**10.6**
2048		1.1	1.5	1.6	1.2	1.8		1.8		1.2	0.6	**10.9**
2050		1.1	1.6	1.7	1.2	1.8		1.8		1.2	0.7	**11.0**
2052	0.4	1.1	1.6	1.7	1.2	1.6	1.7	1.5	1.5	1.0	0.6	**13.9**
2054	0.4	1.1	1.6	1.7	1.2	1.6	1.7	1.5	1.5	1.0	0.6	**13.9**
2056	0.5	1.1	1.6	1.7	1.2	1.6	1.8	1.6	1.5	1.0	0.6	**14.3**
2058	0.5	1.2	1.6	1.8	1.3	1.7	1.9	1.7	1.6	1.0	0.6	**14.9**
2060	0.5	1.2	1.7	1.9	1.3	1.7	2.0	1.8	1.6	1.1	0.6	**15.4**
2062	0.5	1.3	1.7	2.0	1.4	1.8	2.1	1.9	1.6	1.1	0.7	**16.0**
2064	0.5	1.4	1.8	2.0	1.4	1.8	2.2	1.9	1.7	1.1	0.7	**16.5**
2066	0.5	1.4	1.8	2.1	1.5	1.8	2.3	2.0	1.7	1.1	0.7	**17.0**
2068	0.5	1.4	1.9	2.2	1.5	1.9	2.4	2.1	1.8	1.2	0.7	**17.5**
2070	0.5	1.5	1.9	2.2	1.5	1.9	2.5	2.2	1.8	1.2	0.7	**18.0**
2072	0.5	1.5	1.9	2.3	1.6	2.0	2.6	2.3	1.9	1.2	0.8	**18.5**
2074	0.6	1.5	2.0	2.3	1.6	2.0	2.6	2.4	1.9	1.2	0.8	**18.9**
2076	0.6	1.6	2.0	2.4	1.6	2.0	2.7	2.4	1.9	1.3	0.8	**19.3**
2078	0.6	1.6	2.0	2.4	1.7	2.1	2.8	2.5	2.0	1.3	0.8	**19.7**
2080	0.6	1.6	2.0	2.4	1.7	2.1	2.8	2.6	2.0	1.3	0.8	**20.0**
2082	0.6	1.7	2.1	2.5	1.7	2.1	2.9	2.6	2.0	1.3	0.8	**20.3**
2084	0.6	1.7	2.1	2.5	1.7	2.1	2.9	2.7	2.1	1.4	0.9	**20.6**
2086	0.6	1.7	2.1	2.5	1.7	2.2	3.0	2.7	2.1	1.4	0.9	**20.9**
2088	0.6	1.7	2.1	2.6	1.8	2.2	3.0	2.8	2.1	1.4	0.9	**21.2**
2090	0.6	1.7	2.1	2.6	1.8	2.2	3.1	2.8	2.2	1.4	0.9	**21.4**
2092	0.6	1.8	2.1	2.6	1.8	2.2	3.1	2.9	2.2	1.4	0.9	**21.7**
2094	0.6	1.8	2.2	2.6	1.8	2.2	3.1	2.9	2.2	1.5	0.9	**21.9**
2096	0.6	1.8	2.2	2.7	1.8	2.3	3.2	2.9	2.2	1.5	1.0	**22.1**
2098	0.6	1.8	2.2	2.7	1.8	2.3	3.2	3.0	2.2	1.5	1.0	**22.2**
2100	0.6	1.8	2.2	2.7	1.8	2.3	3.2	3.0	2.3	1.5	1.0	**22.4**
2102	0.6	1.8	2.2	2.7	1.9	2.3	3.2	3.0	2.3	1.5	1.0	**22.6**
2104	0.6	1.8	2.2	2.7	1.9	2.3	3.3	3.1	2.3	1.5	1.0	**22.7**

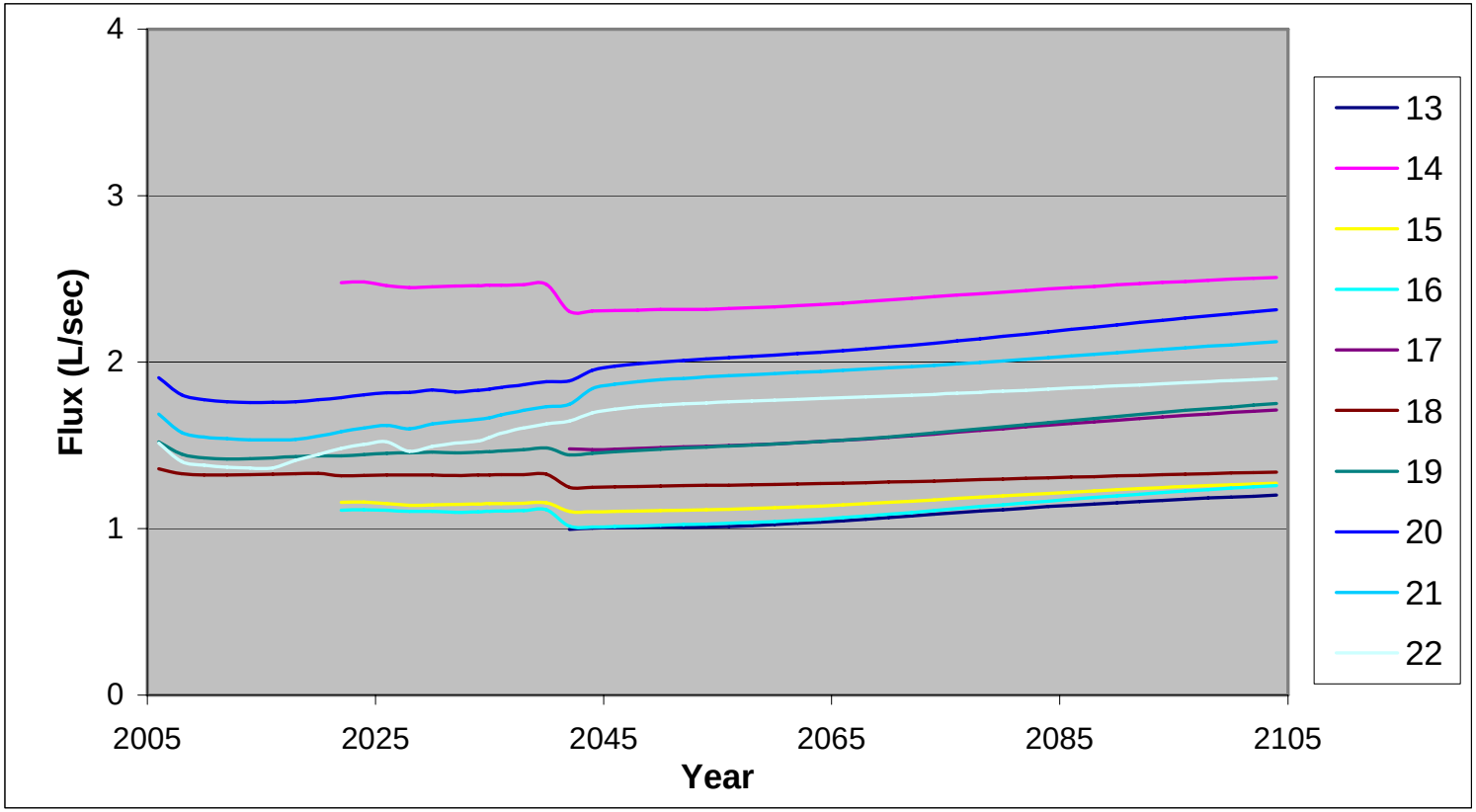
B-2 (S6-8). Predicted range of pumping rates (Litres/second) for SIS wells in the Upper Pike Area (Group 1) (Scenario-6)



B-2 (S6-9). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Upper Pike Area (Group 1) (Scenario-6)

	SIS well #										
Year	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**Total**
2006						1.4	1.5	1.9	1.7	1.5	**8.0**
2008						1.3	1.4	1.8	1.6	1.4	**7.6**
2010						1.3	1.4	1.8	1.6	1.4	**7.5**
2012						1.3	1.4	1.8	1.5	1.4	**7.4**
2014						1.3	1.4	1.8	1.5	1.4	**7.4**
2016						1.3	1.4	1.8	1.5	1.4	**7.4**
2018						1.3	1.4	1.8	1.5	1.4	**7.5**
2020						1.3	1.4	1.8	1.6	1.4	**7.5**
2022		2.5	1.2	1.1		1.3	1.4	1.8	1.6	1.5	**12.4**
2024		2.5	1.2	1.1		1.3	1.4	1.8	1.6	1.5	**12.4**
2026		2.5	1.1	1.1		1.3	1.5	1.8	1.6	1.5	**12.4**
2028		2.4	1.1	1.1		1.3	1.5	1.8	1.6	1.5	**12.3**
2030		2.5	1.1	1.1		1.3	1.5	1.8	1.6	1.5	**12.4**
2032		2.5	1.1	1.1		1.3	1.5	1.8	1.6	1.5	**12.5**
2034		2.5	1.1	1.1		1.3	1.5	1.8	1.7	1.5	**12.5**
2035		2.5	1.1	1.1		1.3	1.5	1.8	1.7	1.5	**12.5**
2036		2.5	1.2	1.1		1.3	1.5	1.8	1.7	1.6	**12.6**
2038		2.5	1.2	1.1		1.3	1.5	1.9	1.7	1.6	**12.7**
2040		2.5	1.2	1.1		1.3	1.5	1.9	1.7	1.6	**12.8**
2042	1.0	2.3	1.1	1.0	1.5	1.2	1.4	1.9	1.7	1.6	**14.9**
2044	1.0	2.3	1.1	1.0	1.5	1.2	1.5	2.0	1.8	1.7	**15.1**
2046	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.7	**15.2**
2048	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.7	**15.2**
2050	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.7	**15.3**
2052	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.7	**15.4**
2054	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.8	**15.4**
2056	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.8	**15.4**
2058	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.8	**15.5**
2060	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.0	1.9	1.8	**15.6**
2062	1.0	2.3	1.1	1.0	1.5	1.3	1.5	2.1	1.9	1.8	**15.6**
2064	1.0	2.3	1.1	1.1	1.5	1.3	1.5	2.1	1.9	1.8	**15.7**
2066	1.0	2.4	1.1	1.1	1.5	1.3	1.5	2.1	2.0	1.8	**15.7**
2068	1.1	2.4	1.1	1.1	1.5	1.3	1.5	2.1	2.0	1.8	**15.8**
2070	1.1	2.4	1.2	1.1	1.5	1.3	1.6	2.1	2.0	1.8	**15.9**
2072	1.1	2.4	1.2	1.1	1.6	1.3	1.6	2.1	2.0	1.8	**16.0**
2074	1.1	2.4	1.2	1.1	1.6	1.3	1.6	2.1	2.0	1.8	**16.1**
2076	1.1	2.4	1.2	1.1	1.6	1.3	1.6	2.1	2.0	1.8	**16.2**
2078	1.1	2.4	1.2	1.1	1.6	1.3	1.6	2.1	2.0	1.8	**16.3**
2080	1.1	2.4	1.2	1.1	1.6	1.3	1.6	2.2	2.0	1.8	**16.4**
2082	1.1	2.4	1.2	1.2	1.6	1.3	1.6	2.2	2.0	1.8	**16.5**
2084	1.1	2.4	1.2	1.2	1.6	1.3	1.6	2.2	2.0	1.8	**16.6**
2086	1.1	2.4	1.2	1.2	1.6	1.3	1.6	2.2	2.0	1.8	**16.7**
2088	1.1	2.5	1.2	1.2	1.6	1.3	1.7	2.2	2.0	1.9	**16.7**
2090	1.2	2.5	1.2	1.2	1.7	1.3	1.7	2.2	2.1	1.9	**16.8**
2092	1.2	2.5	1.2	1.2	1.7	1.3	1.7	2.2	2.1	1.9	**16.9**
2094	1.2	2.5	1.2	1.2	1.7	1.3	1.7	2.3	2.1	1.9	**17.0**
2096	1.2	2.5	1.3	1.2	1.7	1.3	1.7	2.3	2.1	1.9	**17.1**
2098	1.2	2.5	1.3	1.2	1.7	1.3	1.7	2.3	2.1	1.9	**17.2**
2100	1.2	2.5	1.3	1.2	1.7	1.3	1.7	2.3	2.1	1.9	**17.2**
2102	1.2	2.5	1.3	1.3	1.7	1.3	1.7	2.3	2.1	1.9	**17.3**
2104	1.2	2.5	1.3	1.3	1.7	1.3	1.8	2.3	2.1	1.9	**17.4**

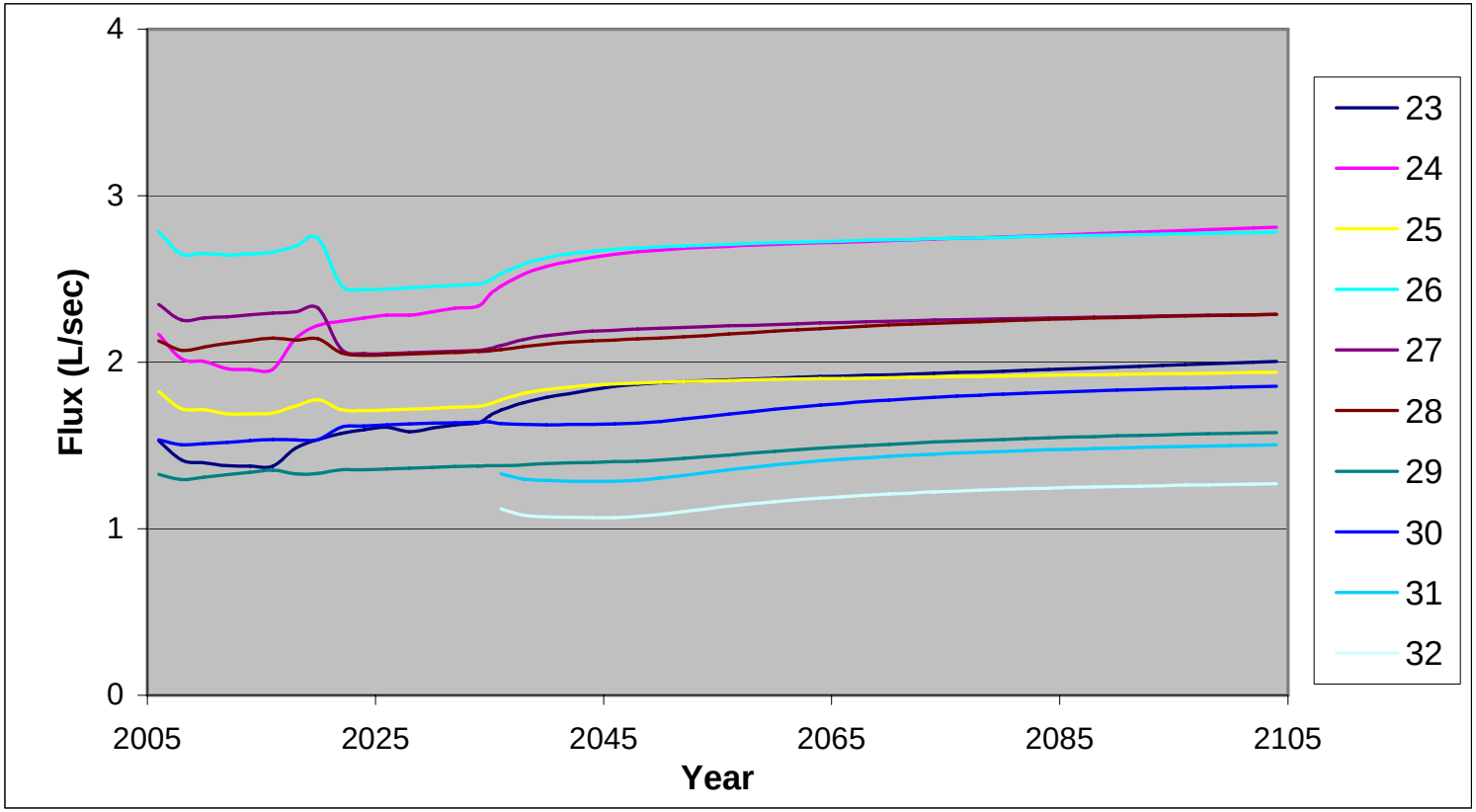
B-2 (S6-10). Predicted range of pumping rates (Litres/second) for SIS wells in the Upper Pike Area (Group 2) (Scenario-6)



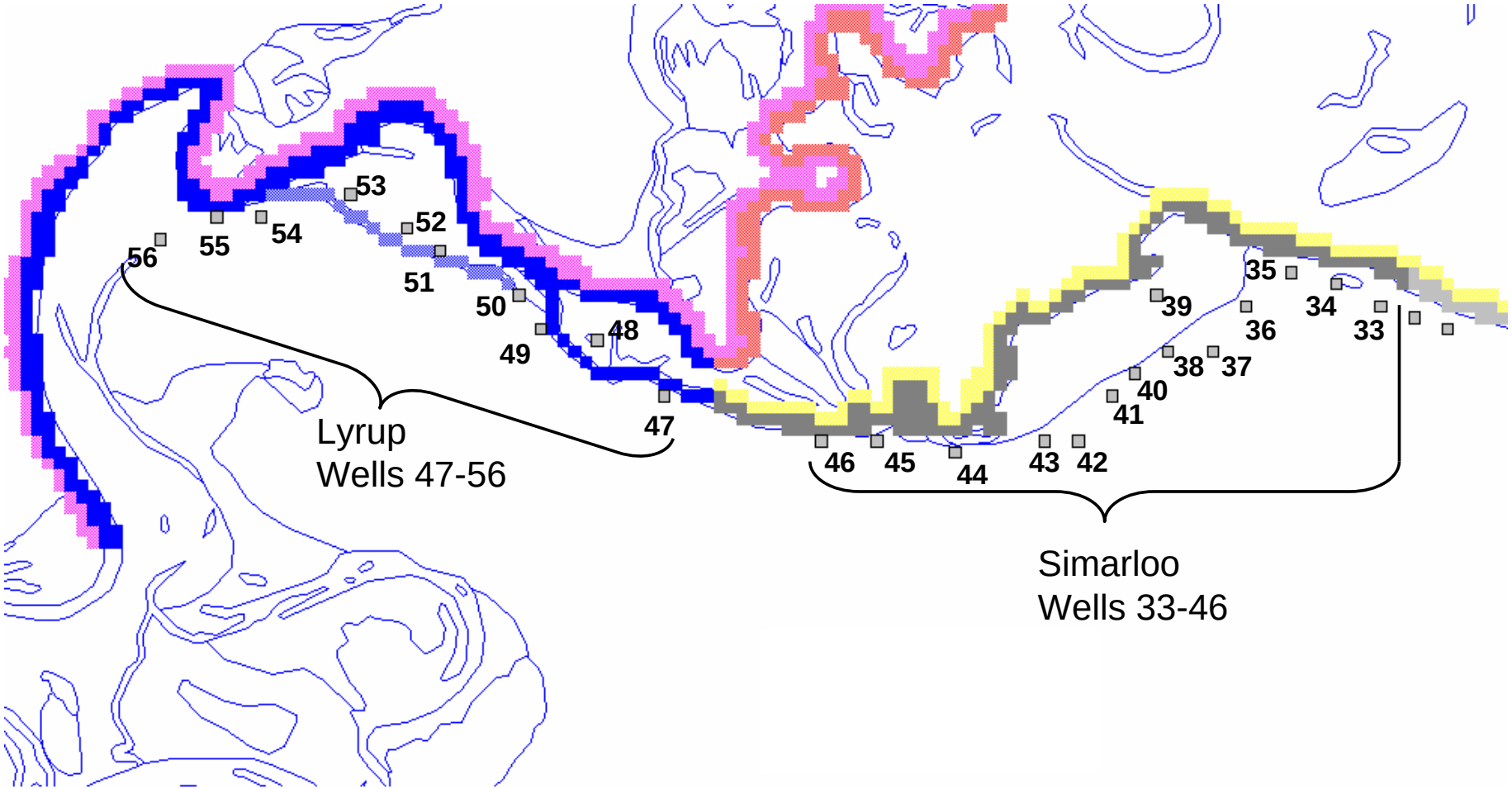
B-2 (S6-11). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Upper Pike Area (Group 2) (Scenario-6)

	SIS well #										
Year	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**Total**
2006	1.5	2.2	1.8	2.8	2.3	2.1	1.3	1.5			**15.6**
2008	1.4	2.0	1.7	2.6	2.3	2.1	1.3	1.5			**14.9**
2010	1.4	2.0	1.7	2.7	2.3	2.1	1.3	1.5			**14.9**
2012	1.4	2.0	1.7	2.6	2.3	2.1	1.3	1.5			**14.9**
2014	1.4	2.0	1.7	2.7	2.3	2.1	1.3	1.5			**15.0**
2016	1.4	2.0	1.7	2.7	2.3	2.1	1.4	1.5			**15.0**
2018	1.5	2.1	1.7	2.7	2.3	2.1	1.3	1.5			**15.4**
2020	1.5	2.2	1.8	2.7	2.3	2.1	1.3	1.5			**15.6**
2022	1.6	2.2	1.7	2.5	2.1	2.1	1.4	1.6			**15.1**
2024	1.6	2.3	1.7	2.4	2.1	2.0	1.4	1.6			**15.1**
2026	1.6	2.3	1.7	2.4	2.1	2.0	1.4	1.6			**15.1**
2028	1.6	2.3	1.7	2.4	2.1	2.0	1.4	1.6			**15.1**
2030	1.6	2.3	1.7	2.5	2.1	2.1	1.4	1.6			**15.2**
2032	1.6	2.3	1.7	2.5	2.1	2.1	1.4	1.6			**15.3**
2034	1.6	2.3	1.7	2.5	2.1	2.1	1.4	1.6			**15.3**
2035	1.7	2.4	1.7	2.5	2.1	2.1	1.4	1.6			**15.5**
2036	1.7	2.5	1.8	2.5	2.1	2.1	1.4	1.6	1.3	1.1	**18.1**
2038	1.8	2.5	1.8	2.6	2.1	2.1	1.4	1.6	1.3	1.1	**18.3**
2040	1.8	2.6	1.8	2.6	2.2	2.1	1.4	1.6	1.3	1.1	**18.5**
2042	1.8	2.6	1.9	2.7	2.2	2.1	1.4	1.6	1.3	1.1	**18.6**
2044	1.8	2.6	1.9	2.7	2.2	2.1	1.4	1.6	1.3	1.1	**18.7**
2046	1.9	2.6	1.9	2.7	2.2	2.1	1.4	1.6	1.3	1.1	**18.8**
2048	1.9	2.7	1.9	2.7	2.2	2.1	1.4	1.6	1.3	1.1	**18.8**
2050	1.9	2.7	1.9	2.7	2.2	2.1	1.4	1.6	1.3	1.1	**18.9**
2052	1.9	2.7	1.9	2.7	2.2	2.2	1.4	1.7	1.3	1.1	**19.0**
2054	1.9	2.7	1.9	2.7	2.2	2.2	1.4	1.7	1.3	1.1	**19.1**
2056	1.9	2.7	1.9	2.7	2.2	2.2	1.4	1.7	1.4	1.1	**19.2**
2058	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.7	1.4	1.1	**19.3**
2060	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.7	1.4	1.2	**19.4**
2062	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.7	1.4	1.2	**19.4**
2064	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.7	1.4	1.2	**19.5**
2066	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.8	1.4	1.2	**19.6**
2068	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.8	1.4	1.2	**19.6**
2070	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.8	1.4	1.2	**19.7**
2072	1.9	2.7	1.9	2.7	2.2	2.2	1.5	1.8	1.4	1.2	**19.7**
2074	1.9	2.7	1.9	2.7	2.3	2.2	1.5	1.8	1.4	1.2	**19.8**
2076	1.9	2.7	1.9	2.7	2.3	2.2	1.5	1.8	1.5	1.2	**19.8**
2078	1.9	2.7	1.9	2.7	2.3	2.2	1.5	1.8	1.5	1.2	**19.9**
2080	1.9	2.8	1.9	2.8	2.3	2.2	1.5	1.8	1.5	1.2	**19.9**
2082	2.0	2.8	1.9	2.8	2.3	2.3	1.5	1.8	1.5	1.2	**20.0**
2084	2.0	2.8	1.9	2.8	2.3	2.3	1.5	1.8	1.5	1.2	**20.0**
2086	2.0	2.8	1.9	2.8	2.3	2.3	1.5	1.8	1.5	1.2	**20.0**
2088	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.1**
2090	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.1**
2092	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.1**
2094	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.2**
2096	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.2**
2098	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.2**
2100	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.8	1.5	1.3	**20.3**
2102	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.9	1.5	1.3	**20.3**
2104	2.0	2.8	1.9	2.8	2.3	2.3	1.6	1.9	1.5	1.3	**20.3**

B-2 (S6-12). Predicted range of pumping rates (Litres/second) for SIS wells in the Mid Pike Area (Scenario-6)



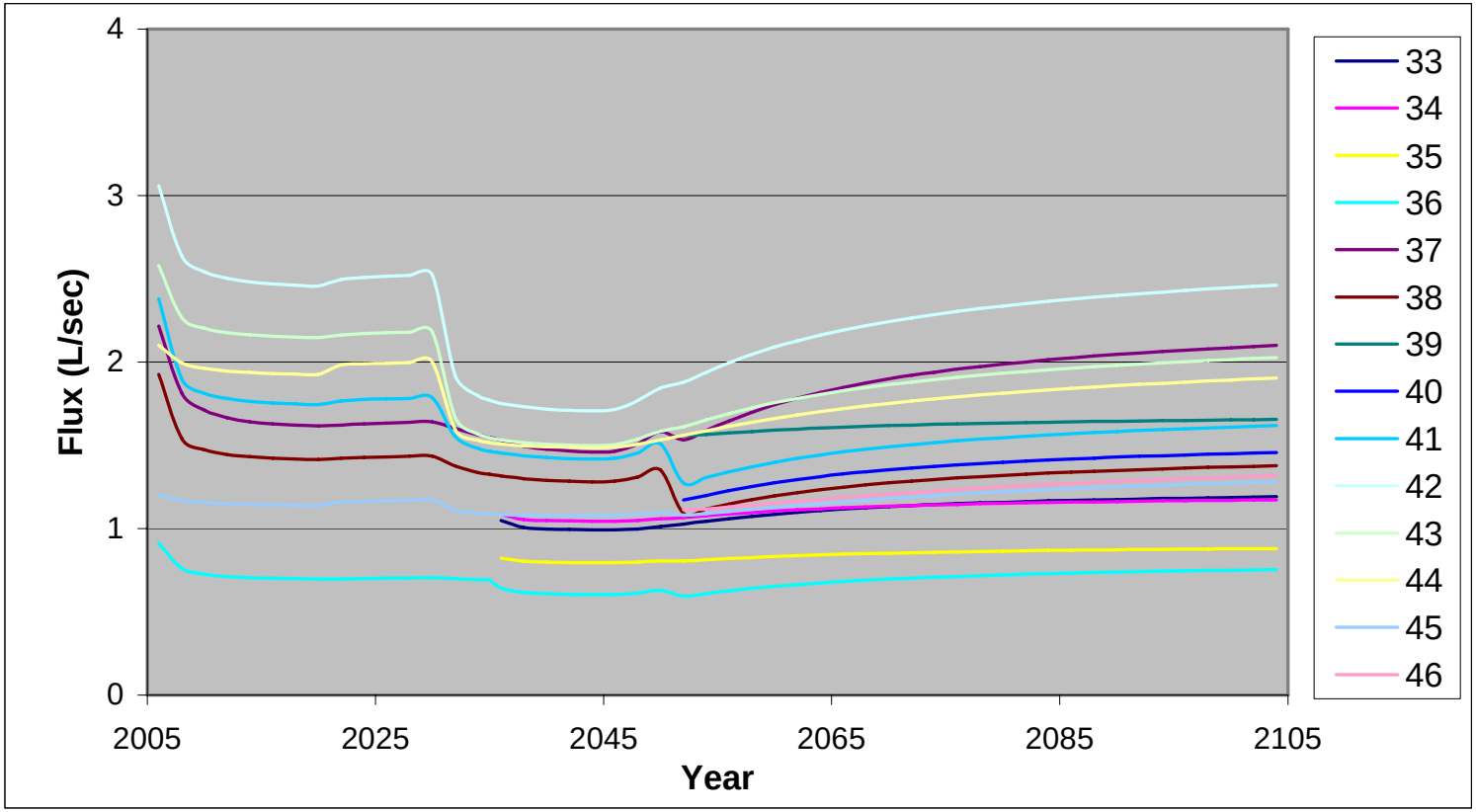
B-2 (S6-13). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Mid Pike Area (Scenario-6)



B-2 (S6-14). Pike concept SIS wells in the Lyrup and Simarloo areas (Scenario-6)

	SIS well #														
Year	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**Total**
2006				0.9	2.2	1.9			2.4	3.1	2.6	2.1	1.2		**16.4**
2008				0.8	1.8	1.5			1.9	2.6	2.3	2.0	1.2		**14.1**
2010				0.7	1.7	1.5			1.8	2.5	2.2	2.0	1.2		**13.6**
2012				0.7	1.7	1.4			1.8	2.5	2.2	1.9	1.2		**13.4**
2014				0.7	1.6	1.4			1.8	2.5	2.2	1.9	1.1		**13.3**
2016				0.7	1.6	1.4			1.8	2.5	2.2	1.9	1.1		**13.2**
2018				0.7	1.6	1.4			1.7	2.5	2.2	1.9	1.1		**13.2**
2020				0.7	1.6	1.4			1.7	2.5	2.1	1.9	1.1		**13.1**
2022				0.7	1.6	1.4			1.8	2.5	2.2	2.0	1.2		**13.3**
2024				0.7	1.6	1.4			1.8	2.5	2.2	2.0	1.2		**13.4**
2026				0.7	1.6	1.4			1.8	2.5	2.2	2.0	1.2		**13.4**
2028				0.7	1.6	1.4			1.8	2.5	2.2	2.0	1.2		**13.4**
2030				0.7	1.6	1.4			1.8	2.5	2.2	2.0	1.2		**13.4**
2032				0.7	1.6	1.4			1.6	1.9	1.7	1.6	1.1		**11.5**
2034				0.7	1.6	1.3			1.5	1.8	1.6	1.5	1.1		**11.1**
2035				0.7	1.5	1.3			1.5	1.8	1.5	1.5	1.1		**11.0**
2036	1.0	1.1	0.8	0.6	1.5	1.3			1.5	1.8	1.5	1.5	1.1		**13.8**
2038	1.0	1.1	0.8	0.6	1.5	1.3			1.4	1.7	1.5	1.5	1.1		**13.5**
2040	1.0	1.0	0.8	0.6	1.5	1.3			1.4	1.7	1.5	1.5	1.1		**13.4**
2042	1.0	1.0	0.8	0.6	1.5	1.3			1.4	1.7	1.5	1.5	1.1		**13.4**
2044	1.0	1.0	0.8	0.6	1.5	1.3			1.4	1.7	1.5	1.5	1.1		**13.4**
2046	1.0	1.0	0.8	0.6	1.5	1.3			1.4	1.7	1.5	1.5	1.1		**13.4**
2048	1.0	1.0	0.8	0.6	1.5	1.3			1.5	1.8	1.5	1.5	1.1		**13.6**
2050	1.0	1.1	0.8	0.6	1.6	1.4			1.5	1.8	1.6	1.5	1.1		**14.0**
2052	1.0	1.1	0.8	0.6	1.5	1.1	1.6	1.2	1.3	1.9	1.6	1.6	1.1	1.1	**17.4**
2054	1.0	1.1	0.8	0.6	1.6	1.1	1.6	1.2	1.3	1.9	1.7	1.6	1.1	1.1	**17.7**
2056	1.1	1.1	0.8	0.6	1.6	1.1	1.6	1.2	1.3	2.0	1.7	1.6	1.1	1.1	**18.1**
2058	1.1	1.1	0.8	0.6	1.7	1.2	1.6	1.3	1.4	2.0	1.7	1.6	1.1	1.1	**18.4**
2060	1.1	1.1	0.8	0.7	1.7	1.2	1.6	1.3	1.4	2.1	1.8	1.7	1.1	1.2	**18.7**
2062	1.1	1.1	0.8	0.7	1.8	1.2	1.6	1.3	1.4	2.1	1.8	1.7	1.1	1.2	**18.9**
2064	1.1	1.1	0.8	0.7	1.8	1.2	1.6	1.3	1.4	2.2	1.8	1.7	1.2	1.2	**19.2**
2066	1.1	1.1	0.8	0.7	1.8	1.2	1.6	1.3	1.5	2.2	1.8	1.7	1.2	1.2	**19.4**
2068	1.1	1.1	0.9	0.7	1.9	1.3	1.6	1.3	1.5	2.2	1.8	1.7	1.2	1.2	**19.5**
2070	1.1	1.1	0.9	0.7	1.9	1.3	1.6	1.4	1.5	2.2	1.9	1.8	1.2	1.2	**19.7**
2072	1.1	1.1	0.9	0.7	1.9	1.3	1.6	1.4	1.5	2.3	1.9	1.8	1.2	1.2	**19.9**
2074	1.1	1.1	0.9	0.7	1.9	1.3	1.6	1.4	1.5	2.3	1.9	1.8	1.2	1.2	**20.0**
2076	1.1	1.1	0.9	0.7	2.0	1.3	1.6	1.4	1.5	2.3	1.9	1.8	1.2	1.2	**20.1**
2078	1.2	1.1	0.9	0.7	2.0	1.3	1.6	1.4	1.5	2.3	1.9	1.8	1.2	1.2	**20.2**
2080	1.2	1.2	0.9	0.7	2.0	1.3	1.6	1.4	1.5	2.3	1.9	1.8	1.2	1.3	**20.3**
2082	1.2	1.2	0.9	0.7	2.0	1.3	1.6	1.4	1.6	2.4	1.9	1.8	1.2	1.3	**20.4**
2084	1.2	1.2	0.9	0.7	2.0	1.3	1.6	1.4	1.6	2.4	2.0	1.8	1.2	1.3	**20.5**
2086	1.2	1.2	0.9	0.7	2.0	1.3	1.6	1.4	1.6	2.4	2.0	1.8	1.2	1.3	**20.6**
2088	1.2	1.2	0.9	0.7	2.0	1.3	1.6	1.4	1.6	2.4	2.0	1.9	1.2	1.3	**20.7**
2090	1.2	1.2	0.9	0.7	2.0	1.4	1.6	1.4	1.6	2.4	2.0	1.9	1.3	1.3	**20.8**
2092	1.2	1.2	0.9	0.7	2.1	1.4	1.6	1.4	1.6	2.4	2.0	1.9	1.3	1.3	**20.8**
2094	1.2	1.2	0.9	0.7	2.1	1.4	1.6	1.4	1.6	2.4	2.0	1.9	1.3	1.3	**20.9**
2096	1.2	1.2	0.9	0.7	2.1	1.4	1.6	1.4	1.6	2.4	2.0	1.9	1.3	1.3	**21.0**
2098	1.2	1.2	0.9	0.7	2.1	1.4	1.7	1.4	1.6	2.4	2.0	1.9	1.3	1.3	**21.0**
2100	1.2	1.2	0.9	0.8	2.1	1.4	1.7	1.5	1.6	2.4	2.0	1.9	1.3	1.3	**21.1**
2102	1.2	1.2	0.9	0.8	2.1	1.4	1.7	1.5	1.6	2.5	2.0	1.9	1.3	1.3	**21.1**
2104	1.2	1.2	0.9	0.8	2.1	1.4	1.7	1.5	1.6	2.5	2.0	1.9	1.3	1.3	**21.2**

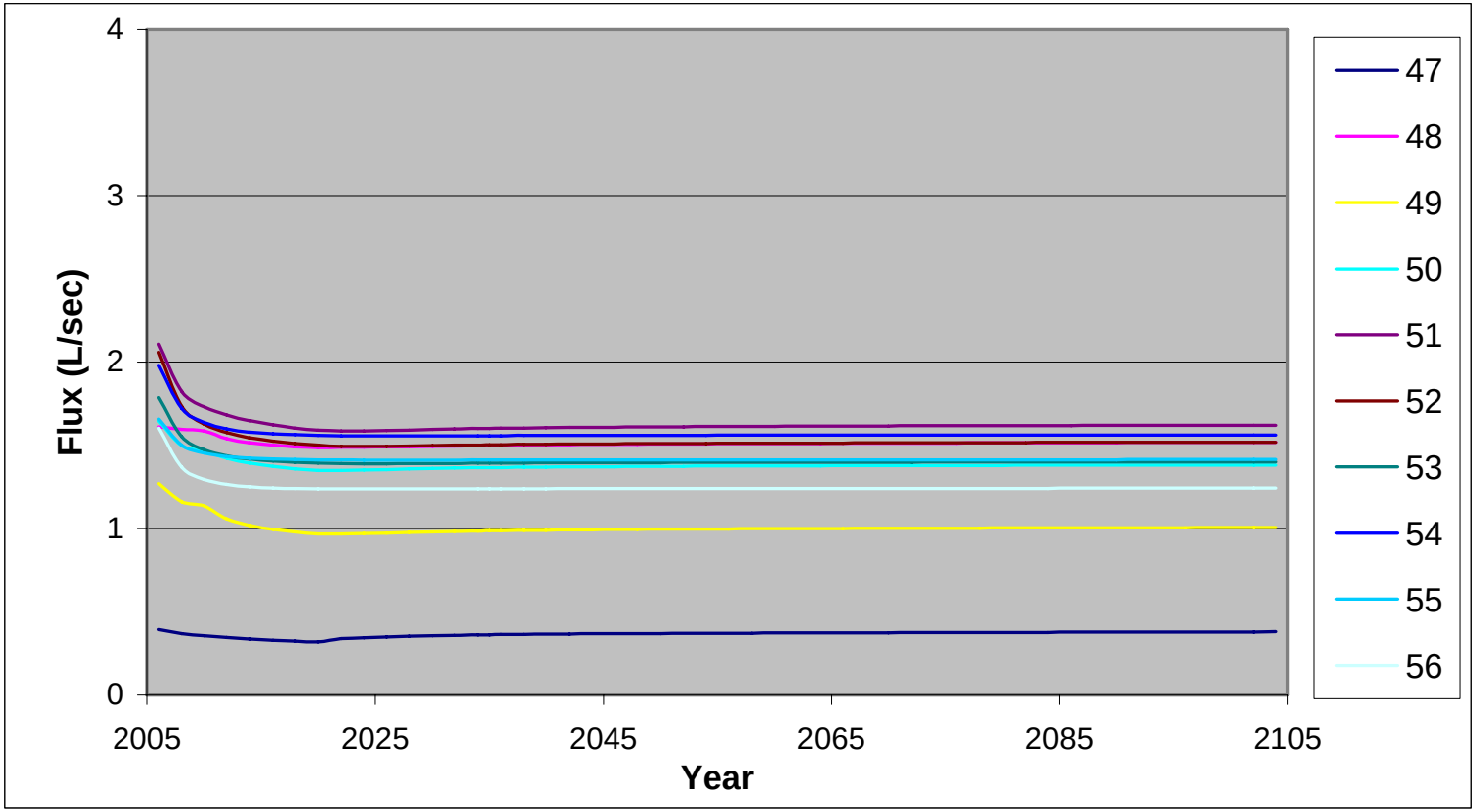
B-2 (S6-15). Predicted range of pumping rates (Litres/second) for SIS wells in the Simarloo Area (Scenario-6)



B-2 (S6-16). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Simarloo Area (Scenario-6)

	SIS well #										
Year	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**Total**
2006	0.4	1.6	1.3	1.6	2.1	2.1	1.8	2.0	1.7	1.6	**16.1**
2008	0.4	1.6	1.2	1.5	1.8	1.7	1.6	1.7	1.5	1.4	**14.3**
2010	0.4	1.6	1.1	1.5	1.7	1.6	1.5	1.6	1.5	1.3	**13.8**
2012	0.3	1.5	1.1	1.4	1.7	1.6	1.4	1.6	1.4	1.3	**13.4**
2014	0.3	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.3	**13.1**
2016	0.3	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2018	0.3	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2020	0.3	1.5	1.0	1.3	1.6	1.5	1.4	1.6	1.4	1.2	**12.8**
2022	0.3	1.5	1.0	1.3	1.6	1.5	1.4	1.6	1.4	1.2	**12.8**
2024	0.3	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.8**
2026	0.3	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.8**
2028	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2030	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2032	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2034	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2035	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2036	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2038	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2040	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**12.9**
2042	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2044	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2046	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2048	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2050	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2052	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2054	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2056	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2058	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2060	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2062	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2064	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2066	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2068	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2070	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2072	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2074	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2076	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2078	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2080	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2082	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2084	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2086	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2088	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2090	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2092	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2094	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2096	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2098	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2100	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2102	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.0**
2104	0.4	1.5	1.0	1.4	1.6	1.5	1.4	1.6	1.4	1.2	**13.1**

B-2 (S6-17). Predicted range of pumping rates (Litres/second) for SIS wells in the Lyrup Area (Scenario-6)



B-2 (S6-18). Graph of predicted range of pumping rates (Litres/second) for SIS wells in the Lyrup Area (Scenario-6)

C. HYDROGEOLOGY DATA

C–1. Hydrostratigraphic units in the Pike Murtho Region

C–2. Surface water features within the Pike Mundic floodplain

C–3. Summary of aquifer test results for the project area

C–4. Salinity review data for Pike Murtho region

C–5. Mean and median salinity values for allocated areas at Murtho

C–6. Wells used and allocated areas created for Murtho salinity analysis

C–7. Wells investigated for salinity data in the Pike region

C–8. Summary of pool levels along Pike River and River Murray

C-1. Hydrostratigraphic units in the Pike Murtho Region (Stadter, 2005)

Age	Stratigraphic unit	Hydrostratigraphic unit	Lithology
Quaternary	Woorinen Formation	Perched aquifer where Blanchetown Clay inhibits vertical recharge.	Brown and reddish coloured aeolian silts and fine to medium ferruginous sands. Regularly containing moderate to hard calcrete horizons.
Quaternary	Coonambidgal Clay	Aquitard.	Light greyish coloured moderately dense clay. Generally quite rollable with moderate plasticity.
Quaternary	Monoman Formation	Aquifer, semi-unconfined along the river valley.	Yellowish brown to greyish coloured fine to coarse sands and gravels. Clay lenses. Can be micaceous.
Quaternary	Blanchetown Clay	Aquitard.	Reddish brown silty gritty clays to light green, moderate to very dense clay with high plasticity.
Pliocene	Loxton Parilla Sands – Upper [1]	Aquifer, unconfined to semi confined in highland areas.	Yellowish orange coloured ferruginous fine to coarse sands and fine gravels.
	Loxton Parilla Sands – Lower [1]	Aquifer (as above)	Greyish coloured medium to coarse sands and fine to medium gravels. Quite micaceous, often carbonaceous and pyritic.
Pliocene	Lower Loxton Shells [1]	Aquitard. Transition from leaky zone to clay proper.	Medium greyish coloured silts and clays with interbedded shell fragments. Micaceous. Generally increasing in density and plasticity with depth.
	Lower Loxton Clays [1]		
Mio-Pliocene	Bookpurnong Beds	Aquitard. Main confining unit between Pliocene / Monoman sands and Murray Group.	Olive greyish to green coloured moderate dense, fossiliferous clay. Can be quite silty, but generally quite rollable, with high plasticity.
Miocene	Murray Group Limestone	Confined aquifer, multilayered.	Grey to off-white coloured fossiliferous, sandy limestone. Many different stratigraphic units within.

Note 1 – Denotes units not formally recognised

Locks
Roads
River Murray
Wetlands
Evaporation basins
River Murray Floodplain (1956 flood extent)
Irrigated areas (2003)

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GDA

0 0.3 0.6 0.9 1.2 1.5 Kilometres

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Appendix C-2: Surface water features within the Pike Mundic floodplain

C-3. Summary of aquifer test results for the project area (after REM-Aquaterra, 2005a)

Site	Test method	Aquifer	Aquifer type	K (m/d)[1]	Storage	Reference
EB1-P-LPP	Constant rate (24 hrs)	Loxton-Parilla Sands	Unconfined [2]	2.5–3	0.13 (Sy)	REM (2002b)
EB1-P-MGL	Constant rate (24 hrs)	Pata Limestone or Equivalent	Confined [2]	0.05–0.1	0.001 (Ss)	REM (2002b)
RRP1-MS	Constant rate (12 hrs)	Monoman formation	Semi-confined	18 [3]	0.0004	URS (2000)
RRP2-MG	Shut-in (2 hrs recovery)	Mannum Limestone	Confined	0.05 [4]	–	URS (2000)
11	Constant rate (15 days)	Lower Loxton-Parilla Sands	Discontinuous semiconfined [2]	0.8 [3]	0.0003 (Ss) [3]	REM (2005)
13	Constant rate (15 days)	Lower Loxton-Parilla Sands	Semi confined [2]	4 [3]	0.002 (Ss) [3]	REM (2005)
17	Constant rate (15 days)	Lower Loxton-Parilla Sands	Semi-confined [2]	2 [3]	0.0002 (Ss) [3]	REM (2005)
56	Constant rate (15 days)	Lower Loxton-Parilla Sands	Unconfined [2]	3 [3]	0.0005 (Ss) [3] 0.06 (Sy) [3]	REM (2005)
139	Slug	Blanchetown Clay	Aquitard	0.0003	–	REM (2002b)
EB1C	Slug	Bookpurnong Beds	Aquitard	0.0006	–	REM (2002b)
MUMB04	Slug	Lower Loxton-Parilla Sands	Semi-confined	0.3	–	REM (2002b)
PMA2A	Slug	Monoman formation	Semi-confined	19	–	REM (2002b)
PMA2B	Slug	Pata Formation	Confined	0.07	–	REM (2002b)
PMA2C	Slug	Pata Formation	Confined	0.07	–	REM (2002b)
GG5	Slug	Monoman Formation	Semi-confined	2	–	REM (2002c)
GG7	Slug	Bookpurnong Beds	Confined	0.7–1.6	–	REM (2002c)
GG8	Slug	Lower Loxton-Parilla Sands	Semi-confined	1	–	REM (2002c)
GG9	Slug	Bookpurnong Beds	Confined	0.2–0.3	–	REM (2002c)

Note 1 – Hydraulic conductivity

Note 2 – Derived from the test analysis

Note 3 – Geometric mean of analysis of multiple observation wells

Note 4 – Head shut-in test

ID	ID_Type	Name	Easting	Northing	Drilled	EC	TDS	Anom	Comment	Method	TDS Calculated From	X = TDS / EC	Quality * (of TDS Value)
110013	Permit_Number	CMO1	480879.881	6224227.991	2005_06	41500	26384	No	Poor yielding?	Airlift	EC - SAGEODATA	0.636	Medium
110000	Permit_Number	CMO2	481610.487	6226274.475	2005_06	62700	43890	No	Effects of Evapotranspiration.	Airlift	EC - SAGEODATA	0.700	Medium
109994	Permit_Number	CMO4	481498.048	6228064.288	2005_06	51400	33710	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.656	Medium
109991	Permit_Number	CMO7d	479212.671	6229624.050	2005_06	55700	38990	Possible	Poor yield, sufficient development?	Airlift	EC - SAGEODATA	0.700	Low
109990	Permit_Number	CMO7s	479214.921	6229623.229	2005_06	57200	40040	Possible	No yield information.	Airlift	EC - SAGEODATA	0.700	Medium
109993	Permit_Number	CMO8	479333.430	6229555.011	2005_06	68100	47670	Possible	No yield information.	Airlift	EC - SAGEODATA	0.700	Medium
110009	Permit_Number	CMO9	479731.899	6229343.303	2005_06	59200	41440	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.700	Medium
110014	Permit_Number	CMP1	480942.032	6224466.289	2005_06	41100	26130	No	Plentiful data - Pumped (300mins).	Pump	EC - SAGEODATA	0.636	High
110001	Permit_Number	CMP2	481630.111	6226255.066	2005_06	See_Analysis	44200	No	TDS by Calc (AWQC) End of Constant Discharge Test (~3 days @ 4L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
110010	Permit_Number	CMP4	479361.366	6229527.843	2005_06	See_Analysis	49100	No	TDS by Calc (AWQC) End of Constant Discharge Test (~3 days @ 7L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
110003	Permit_Number	EF1	480322.437	6224514.677	2005_06	43400	27767	Possible	No yield information.	Airlift	EC - SAGEODATA	0.640	Medium
110002	Permit_Number	EF2	479586.552	6224620.358	2005_06	31800	19598	Possible	Yield should have been ok. Enough time?	Airlift	EC - SAGEODATA	0.616	Medium
109992	Permit_Number	EF5	477240.730	6229773.789	2005_06	60600	42420	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.700	Medium
109995	Permit_Number	EF7	481114.305	6228817.559	2005_06	45500	29295	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.644	Medium
110008	Permit_Number	SMO1	479947.108	6220853.380	2005_06	26400	15969	Possible	Appears low, comparable with SMP1. More development required?	Airlift	EC - SAGEODATA	0.605	Low
110005	Permit_Number	SMO2	480218.425	6222666.590	2005_06	41900	26680	No	No yield information.	Airlift	EC - SAGEODATA	0.637	Medium
110004	Permit_Number	SMO3	480043.076	6222633.958	2005_06	32000	19721	No	Thought this may have been higher.	Airlift	EC - SAGEODATA	0.616	Medium
110007	Permit_Number	SMP1	480007.057	6220689.998	2005_06	28600	17448	Possible	Final sample, accurate (after initial chlorine dosing then 151mins pumping).	Pump	EC - SAGEODATA	0.610	High
110006	Permit_Number	SMP2	480254.254	6222480.685	2005_06	13650	7896	Yes	Very low yield, thus low volume pumped (100mins).	Pump	EC - SAGEODATA	0.578	Anom
65048	Permit_Number	Site 1	489874.100	6235279.900	2004	46500	30032	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.646	Medium
65049	Permit_Number	Site 2	485981.800	6231918.000	2004	45300	29166	Possible	May be slightly low, very small yield.	Airlift	EC - SAGEODATA	0.644	Medium
65050	Permit_Number	Site 3	487243.000	6230748.200	2004	41200	26193	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.636	Medium
65051	Permit_Number	Site 4	486089.200	6229615.100	2004	45200	29102	No	Poor yield.	Airlift	EC - SAGEODATA	0.644	Medium
65134	Permit_Number	Site 5 O1	489506.200	6227906.200	2004	20380	12070	Yes	Development not sufficient.	Airlift	EC - SAGEODATA	0.592	Anom
65054	Permit_Number	Site 6	482715.700	6225199.300	2004	46700	30208	No	Poor yield - Capful of Chlorine added to aid breakdown of polymer.	Airlift	EC - SAGEODATA	0.647	Medium
65055	Permit_Number	Site 7	486228.200	6222022.300	2004	50900	33332	No	Poor yield - Capful of Chlorine added to aid breakdown of polymer.	Airlift	EC - SAGEODATA	0.655	Medium
65056	Permit_Number	Site 8	485051.000	6218583.700	2004	13120	7575	Yes	Development not sufficient.	Airlift	EC - SAGEODATA	0.577	Anom
65057	Permit_Number	Site 9	482743.800	6214568.900	2004	41100	26130	No	Reasonable development.	Airlift	EC - SAGEODATA	0.636	Medium
65058	Permit_Number	Site 10	494483.300	6214087.800	2004	49300	32137	No	Chlorine used to aid breakdown of polymer. Possible residual polymer.	Airlift	EC - SAGEODATA	0.652	Medium
65140	Permit_Number	Site 11 O1	484787.800	6210522.900	2004	90000	72000	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65141	Permit_Number	Site 11 O2	484774.000	6210508.600	2004	89700	71760	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65142	Permit_Number	Site 11 O3	484744.800	6210474.700	2004	88600	70880	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65144	Permit_Number	Site 11 O4	484786.400	6210524.100	2004	13460	7771	Yes	Very poor yielding well, insufficient development.	Airlift	EC - SAGEODATA	0.577	Anom
100324	Permit_Number	Site 11 O5	484743.200	6210476.000	2004	80500	64400	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65139	Permit_Number	Site 11 P	484811.200	6210548.800	2004	See_Analysis	70500	No	TDS by Calc (AWQC) End of Constant Discharge Test (~19 days @ 3.3L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
65143	Permit_Number	Site 11 D	484236.500	6209845.200	2004	73100	51170	No	Plentiful data - Pumped.	Pump	EC - SAGEODATA	0.700	High
65060	Permit_Number	Site 12	468095.500	6209341.400	2004	4840	2704	No	Reliable. Ec is low due to flushing effect.	Airlift	EC - SAGEODATA	0.559	Medium
65146	Permit_Number	Site 13 O1	480117.500	6207865.800	2004	67700	47390	Yes	Incomplete development of well. Poor yielding. Compare with 13 P aquifer test.	Airlift	EC - SAGEODATA	0.700	Anom
65147	Permit_Number	Site 13 O2	480137.600	6207865.300	2004	79100	55370	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.700	Medium
65148	Permit_Number	Site 13 O3	480182.400	6207863.600	2004	82000	65600	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65149	Permit_Number	Site 13 O4	480082.000	6207903.200	2004	84800	67840	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
100322	Permit_Number	Site 13 O5	480117.500	6207863.500	2004	23000	13743	Yes	Incomplete development of well. Very poor yielding.	Airlift	EC - SAGEODATA	0.598	Anom
100323	Permit_Number	Site 13 O6	480182.600	6207861.400	2004	47900	31080	Yes	Incomplete development of well. Very poor yielding.	Airlift	EC - SAGEODATA	0.649	Anom
65145	Permit_Number	Site 13 P	480082.300	6207866.400	2004	See_Analysis	63600	No	TDS by Calc (AWQC) End of Constant Discharge Test (~27 days @ 5L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
65721	Permit_Number	Site 13 D	481090.300	6207859.900	2004	91400	73120	No	Plentiful data - Pumped (720mins).	Pump	EC - SAGEODATA	0.800	High
65062	Permit_Number	Site 14	471980.200	6205704.300	2004	49300	32137	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.652	Medium
65063	Permit_Number	Site 15	476409.100	6205827.600	2004	55500	38850	Possible	Salinity value may be low, very small yield.	Airlift	EC - SAGEODATA	0.700	Medium
65064	Permit_Number	Site 16	490241.600	6206244.000	2004	75300	52710	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.700	Medium
65173	Permit_Number	Site 17 O1	476680.000	6201989.900	2004	98700	78960	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65174	Permit_Number	Site 17 O2	476700.000	6201989.900	2004	97900	78320	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65175	Permit_Number	Site 17 O3	476745.500	6201990.200	2004	95600	76480	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.800	Medium
65172	Permit_Number	Site 17 P	476645.000	6201989.700	2004	See_Analysis	75800	No	TDS by Calc (AWQC) End of Constant Discharge Test (~19 days @ 2.4L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
65176	Permit_Number	Site 17 D	475630.500	6201963.400	2004	85400	68320	No	Plentiful data - Pumped (720mins).	Pump	EC - SAGEODATA	0.800	High
65066	Permit_Number	Site 18	496656.600	6202000.000	2004	41100	26130	Possible	Poor yield - Capful of Chlorine to aid development. More development required?	Airlift	EC - SAGEODATA	0.636	Medium
65151	Permit_Number	Site 56 P	482963.500	6227861.700	2004	See_Analysis	37700	No	TDS by Calc (AWQC) End of Constant Discharge Test (~29 days @ 8L/s)	Pump	Calc - AWQC	See_Analysis	Very_High
65152	Permit_Number	Site 56 O1	482962.500	6227826.700	2004	50100	32757	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.654	Medium
65153	Permit_Number	Site 56 O2	482962.000	6227806.700	2004	50100	32757	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.654	Medium
65154	Permit_Number	Site 56 O3	482960.400	6227762.000	2004	52800	34785	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.659	Medium
65155	Permit_Number	Site 56 O4	482931.500	6227863.700	2004	50100	32757	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.654	Medium
65722	Permit_Number	Site 56 D	482977.200	6227083.400	2004	48100	31258	No	Plentiful data - Pumped (720mins).	Pump	EC - SAGEODATA	0.650	High
702901035	Unit_Number	GDN 51	461962.030	6198557.190	1987	50000	32643	No	Reasonable. Airlifted until constant salinity. Accuracy to nearest 5000 EC?	Bail	EC - SAGEODATA	0.653	Medium
702901036	Unit_Number	GDN 52	461652.980	6199684.210	1987	50000	32643	No	Reasonable. Airlifted until constant salinity. Accuracy to nearest 5000 EC?	Bail	EC - SAGEODATA	0.653	Medium
702901298	Unit_Number	GDN 65	465570.040	6201947.190	1998	57900	40530	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.700	Medium
702901299	Unit_Number	GDN 66	463107.010	6201034.150	1998	931	512	Yes	AWE Drillhole Document Image. Taken at 16.5 Degrees C. No other Info.	Airlift	EC - SAGEODATA	0.550	Anom
702901300	Unit_Number	GDN 67	463422.030	6199008.140	1998	8520	4829	Yes	AWE Drillhole Document Image. Taken at 16.2 Degrees C. No other Info.	Airlift	EC - SAGEODATA	0.567	Anom
702901332	Unit_Number	GDN 69	462052.010	6200639.010	2000	No-Data	No-Data	No-Data	AWE Hole. No salinity data in State Database. Possibly in a report.	No-Data	No-Data	No-Data	No-Data

Appendix C-4 (1): Salinity review data for Pike Murtho region

ID	ID_Type	Name	Easting	Northing	Drilled	EC	TDS	Anom	Comment	Method	TDS Calculated From	X = TDS / EC	Quality * (of TDS Value)
702901424	Unit_Number	GDN 127	466662.000	6198941.000	2002	See_Analysis	4630	No	Salinity value seems suspiciously low. Possibly not enough development.	Airlift	Calc - UNKN	See_Analysis	Low
702901427	Unit_Number	GDN 130	463208.000	6201459.000	2002	See_Analysis	39600	No	Should be considered reliable.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901428	Unit_Number	GDN 131	463204.000	6201432.000	2002	See_Analysis	40400	No	Should be considered reliable.	Jetting	Calc - UNKN	See_Analysis	Very_High
702901430	Unit_Number	GDN 133	462255.000	6199133.000	2002	See_Analysis	46100	No	Should be considered reliable.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901431	Unit_Number	GDN 134	462851.000	6200123.000	2002	See_Analysis	37000	No	Should be considered reliable.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901502	Unit_Number	GDN 135	465099.420	6200364.490	2002	No-Data	No-Data	No-Data	AWE Hole. No salinity data in State Database. Possibly in a report.	No-Data	No-Data	No-Data	No-Data
702901503	Unit_Number	GDN 136	466496.840	6201471.390	2002	See_Analysis	55700	No	Should be considered reliable.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901545	Unit_Number	GDN 137	461219.000	6199826.000	2002	See_Analysis	26200	No	Should be considered reliable.	Jetting	Calc - UNKN	See_Analysis	Very_High
702901546	Unit_Number	GDN 138	461261.900	6199651.770	2003	See_Analysis	8790	No	Initially thought to be low, seems reasonable. Flushing zone near lock?	Airlift	Calc - UNKN	0.700	Very_High
702901549	Unit_Number	GDN 141	461666.410	6200200.720	2002	See_Analysis	28900	No	Should be considered reliable.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901550	Unit_Number	GDN 142	461333.510	6199290.500	2002	No-Data	No-Data	No-Data	AWE Hole. No salinity data in State Database. Possibly in a report.	No-Data	No-Data	No-Data	No-Data
702901551	Unit_Number	GDN 143	461745.020	6199086.570	2002	No-Data	No-Data	No-Data	AWE Hole. No salinity data in State Database. Possibly in a report.	No-Data	No-Data	No-Data	No-Data
702901579	Unit_Number	GDN 145	461234.000	6199787.000	2002	No-Data	No-Data	No-Data	AWE Hole. No salinity data in State Database. Possibly in a report.	No-Data	No-Data	No-Data	No-Data
702901630	Unit_Number	GDN 146	462107.920	6198545.110	2003	See_Analysis	19100	No	Airlifted with reasonable yields.	Airlift	Calc - UNKN	See_Analysis	Very_High
702901631	Unit_Number	GDN 147	461171.380	6199371.080	2003	See_Analysis	846	Yes	Low yielding obswell. Poor development? Proximity to lock / flushing zone.	Airlift	Calc - UNKN	See_Analysis	Anom
702901633	Unit_Number	GDN 148	461255.290	6199682.410	2003	See_Analysis	10800	No	Initially thought to be low, seems reasonable. Flushing zone near lock?	Airlift	Calc - UNKN	See_Analysis	Very_High
702901632	Unit_Number	GDN 150	461149.330	6199355.170	2003	See_Analysis	2020	Yes	Low yielding, poor development with possible contamination from drilling fluid.	Airlift	Calc - UNKN	See_Analysis	Anom
702900235	Unit_Number	MTH 1	483120.050	6221124.190	1973	See_Analysis	32596	No	Chem analysis (1973) Also have monitoring data from 1994.	When_Drilled	Calc - Amdel	See_Analysis	Very_High
702900236	Unit_Number	MTH 2	490575.000	6221213.000	1968	See_Analysis	32900	No	Seems reasonable - Considering Bailed (1969). E&WS Well, missing data.	When_Drilled	See_Analysis	See_Analysis	Medium
702900017	Unit_Number	MTH 3	482976.000	6227924.000	1973	42220	26927	No	Sampled in 1994. Duplicate MTH 1 data shown on microfiche.	Pump	EC - SAGEODATA	0.638	Medium
702900014	Unit_Number	MTH 4	487119.110	6232062.290	1973	See_Analysis	30670	No	Chem analysis (1973).	When_Drilled	Calc - Amdel	See_Analysis	Very_High
702900012	Unit_Number	MTH 5	494236.000	6231316.000	1973	See_Analysis	27301	No	Chem analysis (1973).	When_Drilled	Calc - Amdel ?	See_Analysis	Very_High
702900015	Unit_Number	MTH 6	489729.000	6226369.000	1973	See_Analysis	34785	No	Chem analysis (1973).	When_Drilled	Calc - Amdel ?	See_Analysis	Very_High
702901334	Unit_Number	MTH 8	483636.010	6230760.000	2000	18000	10565	Yes	Method used by Woodward Clyde needs investigating. See LAP Report.	When_Drilled	EC - SAGEODATA	0.587	Anom
702901335	Unit_Number	MTH 9	484521.990	6227889.040	2000	23000	13743	Yes	Method used by Woodward Clyde needs investigating. See LAP Report.	When_Drilled	EC - SAGEODATA	0.598	Anom
702901336	Unit_Number	MTH 10	485848.010	6226286.020	2000	17700	10389	Yes	Method used by Woodward Clyde needs investigating. See LAP Report.	When_Drilled	EC - SAGEODATA	0.587	Anom
702901350	Unit_Number	MTH 11	481023.960	6222873.950	2001	45700	29470	No	Seems reasonable. R.E.M.	Airlift	EC - SAGEODATA	0.645	Medium
702901351	Unit_Number	MTH 12	480860.020	6219068.050	2001	20230	11981	Possible	Initially thought to be low, seems reasonable. R.E.M. Needs confirming.	Airlift	EC - SAGEODATA	0.592	Low
702901543	Unit_Number	MTH 13	487973.000	6226350.000	2002	5420	3035	Yes	Most likely a zero was left off of the end of the EC value. Pumped in 2003.	Pump	EC - SAGEODATA	0.560	Anom
702900257	Unit_Number	PAG 1	471443.000	6205054.000	1968	See_Analysis	50000	No	E&WS Water sampling. Uncertaintainty about how TDS value was calculated.	Bail	See_Analysis	See_Analysis	Low
702900239	Unit_Number	PAG 2	484381.000	6218222.000	1968	See_Analysis	34300	No	Uncertainty about how TDS value was derived. Dilution Test? AMDEL 1969.	Bail	See_Analysis	See_Analysis	High
702900027	Unit_Number	PAG 4	484634.110	6210206.190	1975	See_Analysis	49000	No	E&WS Water sample analysis (1975). Dilution method.	Unknown	See_Analysis	See_Analysis	High
702900032	Unit_Number	PAG 5	492229.980	6206782.040	1973	See_Analysis	49148	No	Chem analysis (1973) Also have monitoring data from 1994.	Unknown	Calc - Amdel	See_Analysis	Very_High
702900031	Unit_Number	PAG 6	486286.000	6202012.000	1973	See_Analysis	32900	Possible	Salinity may be low - Note on SAGeodata regarding drilling fluid contamination.	Unknown	Calc - Amdel	See_Analysis	Medium
702900024	Unit_Number	PAG 7	480260.000	6201996.000	1973	73300	51310	No	Should be considered reliable.	Unknown	EC - SAGEODATA	0.700	Medium
702900120	Unit_Number	PAG 8	472539.000	6201969.000	1968	See_Analysis	25581	Possible	Salinity may be low - Note on SAGeodata regarding drilling fluid contamination.	When_Drilled	Calc - Amdel	See_Analysis	High
702900256	Unit_Number	PAG 9	474984.060	6205925.210	1968	35342	22000	No	Should be reliable. Multiple salinity records (higher and lower) for this well.	When_Drilled	Assumed EC	See_Analysis	Medium
702901127	Unit_Number	PAG 20	475629.020	6207057.160	1990	45000	28927	No	Leigh Warman, developed until constant salinity obtained.	Pumped	EC - SAGEODATA	0.643	Medium
702901137	Unit_Number	PAG 30	474161.000	6206421.000	1990	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901138	Unit_Number	PAG 31	476178.000	6206842.000	1990	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901140	Unit_Number	PAG 33	476406.490	6205795.630	1990	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901142	Unit_Number	PAG 35	476875.000	6205355.000	1990	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901207	Unit_Number	PAG 37	472586.000	6206200.000	1992	25000	15043	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.602	Medium
702901209	Unit_Number	PAG 39	471055.000	6207970.000	1992	24000	14391	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.600	Medium
702901210	Unit_Number	PAG 41	470701.000	6206932.000	1992	34000	21094	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.620	Medium
702901212	Unit_Number	PAG 43	478657.130	6205343.220	1992	70000	49000	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.700	Medium
702901213	Unit_Number	PAG 44	483872.000	6206386.000	1992	65000	45500	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.700	Medium
702901214	Unit_Number	PAG 45	483465.000	6207581.000	1992	45000	28927	Yes	Compared with consistant neighbouring wells, this value is anomalous.	Airlift	EC - SAGEODATA	0.643	Anom
702901215	Unit_Number	PAG 46	484172.040	6208328.150	1992	60000	42000	No	Leigh Warman, airlifted until constant salinity obtained.	Airlift	EC - SAGEODATA	0.700	Medium
702901226	Unit_Number	PAG 47	470441.940	6206092.980	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901232	Unit_Number	PAG 48	471695.000	6206898.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901221	Unit_Number	PAG 50	472796.000	6206871.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901218	Unit_Number	PAG 53	477841.000	6206125.000	1994	93500	74800	No	Seems to be getting regionally very high. No evidence of contributing factor.	When_Drilled	EC - SAGEODATA	0.800	Medium
702901227	Unit_Number	PAG 55	470029.000	6207155.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901228	Unit_Number	PAG 57	471059.000	6205976.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901225	Unit_Number	PAG 58	474226.000	6204626.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901216	Unit_Number	PAG 59	484201.000	6206609.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901217	Unit_Number	PAG 60	486312.000	6205636.000	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901352	Unit_Number	PAG 65	470024.960	6207156.990	2001	10920	6245	No	After 24 hours of pumping (assumed aquifer test).	Pump	EC - SAGEODATA	0.572	High
702901637	Unit_Number	PAG 87	487999.000	6213904.000	2003	9300	5285	Yes	Not enough development, without presence of Hydrogeologist.	Airlift	EC - SAGEODATA	0.568	Anom
702901542	Unit_Number	PAG 88	474333.000	6204005.000	2002	53900	35617	No	Monitoring in 2003. Pumped 3 well volumes.	Pump	EC - SAGEODATA	0.661	Medium
7941	Bore_ID	RMK 331	499044.080	6231856.160	1985	No-Data	No-Data	No-Data	No salinity data found on record.	N/A	No-Data	No-Data	No-Data
7942	Bore_ID	RMK 332	499444.070	6225656.150	1985	See_Analysis	37922	No	Should be considered reliable - DWLBC, Major Ions. Monitoring (No date).	Unknown	Calc - UNKN	See_Analysis	Very_High
27006	Bore_ID	RMK 335	499422.000	6229378.000	1986	See_Analysis	23604	No	Full chem analysis - Website (1989).	Pumped	Calc - SKM	See_Analysis	Very_High
86776	Bore_ID	RMK 338	497837.000	6224235.000	1988	See_Analysis	43200	No	Full chem analysis - Multiple site, highest TDS aquifer - Website (1996).	Pumped	Calc - SKM	See_Analysis	Very_High
702900002	Unit_Number	7029-2	498589.030	6228723.210	1964	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data

Appendix C-4 (2): Salinity review data for Pike Murtho region

ID	ID_Type	Name	Easting	Northing	Drilled	EC	TDS	Anom	Comment	Method	TDS Calculated From	X = TDS / EC	Quality * (of TDS Value)
702900011	Unit_Number	7029-11	495464.030	6236706.060	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900013	Unit_Number	7029-13	495767.160	6230698.100	Unknown	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900018	Unit_Number	7029-18	483630.100	6227765.220	1973	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900019	Unit_Number	7029-19	483316.140	6227109.250	1973	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900020	Unit_Number	7029-20	483902.130	6222198.240	1973	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900021	Unit_Number	7029-21	492649.150	6217182.200	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900025	Unit_Number	7029-25	480215.190	6202029.950	1973	32840	20307	Yes	Microfiche note - Suspect contamination from fresh drilling fluid.	Pump	Dilution Method	See_Analysis	Anom
702900026	Unit_Number	7029-26	480214.110	6202042.070	1975	37060	23259	Yes	Microfiche note - Suspect contamination from fresh drilling fluid.	Pump	Dilution Method	See_Analysis	Anom
702900028	Unit_Number	7029-28	483081.970	6207018.140	1975	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900029	Unit_Number	7029-29	486305.010	6202063.140	1975	See_Analysis	78000	No	Microfiche record (end of pump testing), analysis method unknown.	Unknown	Dilution Method	See_Analysis	High
702900030	Unit_Number	7029-30	486318.040	6202063.160	1975	See_Analysis	78000	No	Microfiche record (end of 2nd pump test), analysis method unknown.	Pump	Dilution Method	See_Analysis	High
702900041	Unit_Number	7029-41	485535.030	6198963.070	1959	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900042	Unit_Number	7029-42	485488.970	6198836.140	1959	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900237	Unit_Number	7029-237	490472.120	6221190.110	1969	See_Analysis	35450	No	Uncertainty about how TDS value was derived. Dilution Test?	Bail	See_Analysis	See_Analysis	High
702900238	Unit_Number	7029-238	490472.120	6221190.110	1969	See_Analysis	39001	No	Chem analysis (1969).	Unknown	Calc - Amdel	See_Analysis	Very_High
702900240	Unit_Number	7029-240	480846.090	6218858.140	1975	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900634	Unit_Number	7029-634	463131.910	6199208.040	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900635	Unit_Number	7029-635	487002.120	6223148.330	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900636	Unit_Number	7029-636	487122.040	6222178.280	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900637	Unit_Number	7029-637	461635.950	6198995.300	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900638	Unit_Number	7029-638	462061.980	6198898.130	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900639	Unit_Number	7029-639	462246.030	6198734.100	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900649	Unit_Number	7029-649	480300.050	6218807.110	1980	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900650	Unit_Number	7029-650	483220.210	6227161.080	1977	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900651	Unit_Number	7029-651	483699.110	6228026.130	1977	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900652	Unit_Number	7029-652	463316.940	6199328.310	1977	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900654	Unit_Number	7029-654	484216.020	6229156.220	1981	47200	30579	No	Should be considered reliable. 1984, likely when developed during deepening.	Airlift	EC - SAGEODATA	0.648	Medium
702900904	Unit_Number	7029-904	484382.100	6229818.010	1981	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900905	Unit_Number	7029-905	463316.940	6199328.310	1982	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900906	Unit_Number	7029-906	483401.930	6207118.180	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900909	Unit_Number	7029-909	480609.060	6223391.170	1983	See_Analysis	25830	No	Derived from data found on microfiche. Uncertain about EC to TDS conversion.	Airlift	Unknown	See_Analysis	Medium
702900910	Unit_Number	7029-910	481005.090	6223386.220	1983	2650	1468	Yes	Too low to be considered regionally representative.	Airlift	EC - SAGEODATA	0.554	Anom
702900911	Unit_Number	7029-911	462833.040	6198830.170	1983	3560	1979	Yes	Too low to be considered regionally representative. Drainage well.	Unknown	EC - SAGEODATA	0.556	Anom
702900912	Unit_Number	7029-912	483502.120	6207558.230	1984	60100	42070	No	May be higher, contradiction with Micofiche, which suggests 50000 mg/L +	Unknown	EC - SAGEODATA	0.700	Low
702900914	Unit_Number	7029-914	484234.130	6230018.350	1984	46300	29903	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.646	Medium
702900915	Unit_Number	7029-915	483715.100	6229861.230	1984	47600	30885	No	Should be considered reliable.	Airlift	EC - SAGEODATA	0.649	Medium
702900916	Unit_Number	7029-916	462241.070	6199458.290	1985	60100	42070	No	May be higher, contradiction with Micofiche, which suggests 50000 mg/L +	Bail	EC - SAGEODATA	0.700	Low
702900917	Unit_Number	7029-917	463027.090	6199292.340	1985	12258	7051	Yes	Does not seem regionally representative. Lack of data.	Bail	EC - SAGEODATA	0.575	Anom
702900920	Unit_Number	7029-920	483174.000	6226930.000	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900921	Unit_Number	7029-921	483523.100	6227132.010	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900923	Unit_Number	7029-923	472581.060	6206783.130	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900924	Unit_Number	7029-924	472815.040	6206468.120	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900925	Unit_Number	7029-925	483201.900	6206867.990	1985	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900965	Unit_Number	7029-965	484662.050	6227614.170	1986	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900966	Unit_Number	7029-966	483942.920	6229592.180	1986	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900986	Unit_Number	7029-986	482532.080	6228943.120	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702900987	Unit_Number	7029-987	482791.090	6229224.120	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901006	Unit_Number	7029-1006	483712.140	6229813.210	1987	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901034	Unit_Number	7029-1034	484525.030	6229872.250	1990	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901223	Unit_Number	7029-1223	476462.060	6204903.040	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901224	Unit_Number	7029-1224	475976.780	6204745.010	1994	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901233	Unit_Number	7029-1233	479972.120	6219678.170	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901234	Unit_Number	7029-1234	480871.990	6222328.360	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901235	Unit_Number	7029-1235	482622.190	6225078.200	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901236	Unit_Number	7029-1236	482921.990	6228528.030	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901238	Unit_Number	7029-1238	480372.100	6202028.210	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901239	Unit_Number	7029-1239	480772.120	6205178.180	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901240	Unit_Number	7029-1240	481422.110	6207528.030	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901246	Unit_Number	7029-1246	496421.900	6223078.120	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901247	Unit_Number	7029-1247	493721.980	6221928.170	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901248	Unit_Number	7029-1248	490421.910	6221028.100	1989	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901253	Unit_Number	7029-1253	483220.200	6227167.290	1996	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901254	Unit_Number	7029-1254	483622.070	6222708.030	1987	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901255	Unit_Number	7029-1255	484062.100	6222838.190	1971	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901256	Unit_Number	7029-1256	484252.130	6222838.180	1971	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901257	Unit_Number	7029-1257	484401.950	6222838.090	1971	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data

Appendix C-4 (3): Salinity review data for Pike Murtho region

ID	ID_Type	Name	Easting	Northing	Drilled	EC	TDS	Anom	Comment	Method	TDS Calculated From	X = TDS / EC	Quality * (of TDS Value)
702901258	Unit_Number	7029-1258	481221.960	6223158.130	1971	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901259	Unit_Number	7029-1259	480562.070	6222708.040	1975	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901260	Unit_Number	7029-1260	481172.050	6222988.050	1975	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901342	Unit_Number	7029-1342	481171.990	6222988.010	2000	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901343	Unit_Number	7029-1343	483902.010	6222198.050	2000	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901344	Unit_Number	7029-1344	487121.960	6222177.950	2000	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901544	Unit_Number	7029-1544	483994.060	6229988.170	1978	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901685	Unit_Number	BHP 7	463336.670	6201099.260	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901686	Unit_Number	BHP 8	461940.000	6201175.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901687	Unit_Number	BHP 9	461447.000	6199987.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901688	Unit_Number	BHP 10	463201.740	6201442.040	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901689	Unit_Number	BHP 11	461943.000	6200938.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901690	Unit_Number	BHP 12	461943.000	6200938.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901691	Unit_Number	BHP 13	461943.000	6200938.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901692	Unit_Number	BHP 13	461943.000	6200938.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702901925	Unit_Number	7029-1925	462573.000	6201252.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902028	Unit_Number	BHP 6	463212.000	6201456.000	2004	38000	23888	No	AWE Drillhole Document Image. No other Info.	Jetting	EC - SAGEODATA	0.629	Medium
702902091	Unit_Number	7029-2091	487058.000	6234547.000	2005	34200	21254	No	Multiple salinity records.	Unknown	EC - SAGEODATA	0.621	Medium
702902092	Unit_Number	7029-2092	486305.000	6233545.000	2005	36400	22770	No	Multiple salinity records.	Unknown	EC - SAGEODATA	0.626	Medium
702902097	Unit_Number	7029-2097	461265.000	6199612.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902098	Unit_Number	7029-2098	461198.000	6199898.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902099	Unit_Number	7029-2099	461269.000	6199824.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902100	Unit_Number	7029-2100	461227.000	6199741.000	2004	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902101	Unit_Number	7029-2101	461960.000	6201045.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902102	Unit_Number	7029-2102	461919.000	6200861.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902103	Unit_Number	7029-2103	461957.000	6201239.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902104	Unit_Number	7029-2104	462243.000	6201248.000	2005	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
702902105	Unit_Number	7029-2105	461916.000	6201112.000	2004	54400	36001	No	Should be considered reliable.	Unknown	EC - SAGEODATA	0.662	Medium
702902106	Unit_Number	7029-2106	462097.000	6201278.000	2005	42700	27276	No	Should be considered reliable.	Unknown	EC - SAGEODATA	0.639	Medium
702902112	Unit_Number	7029-2112	462108.000	6198539.000	2003	8450	4788	Yes	Does not seem regionally representative. Lack of data.	Unknown	EC - SAGEODATA	0.567	Anom
703000370	Unit_Number	7030-370	492460.000	6239880.220	1967	8549	4844	Possible	Even though this was just a bail sample in 1967, this value looks reliable.	Bail	EC - SAGEODATA	0.567	Low
703000371	Unit_Number	7030-371	493622.960	6239247.200	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
703000372	Unit_Number	7030-372	495461.000	6240228.000	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
703000373	Unit_Number	7030-373	494896.030	6238796.150	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
703000374	Unit_Number	7030-374	495986.050	6238274.010	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
703000381	Unit_Number	7030-381	492653.980	6239544.370	1967	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data
703000434	Unit_Number	7030-434	495942.040	6240282.110	1978	No-Data	No-Data	No-Data	No salinity data found on record.	No-Data	No-Data	No-Data	No-Data

* Assigned on knowledge of region and governing details which contribute to how the TDS value is calculated.

Generally speaking:	Very High	Typical of full chemical analysis.
	High	Typical of sample derived from aquifer test (prolonged pumping period), submitted to Glenside.
	Medium	Typical of airlifted sample which has been submitted to Glenside.
	Low	Typical of sample which, for some reason (short development time) doesn't look as regionally representative as expected.
	Anom	Sample has been flagged as anomalous (due to some contributing factor) as TDS value presented is not considered an accurate representation of regional groundwater conditions.

Appendix C-4 (4): Salinity review data for Pike Murtho region

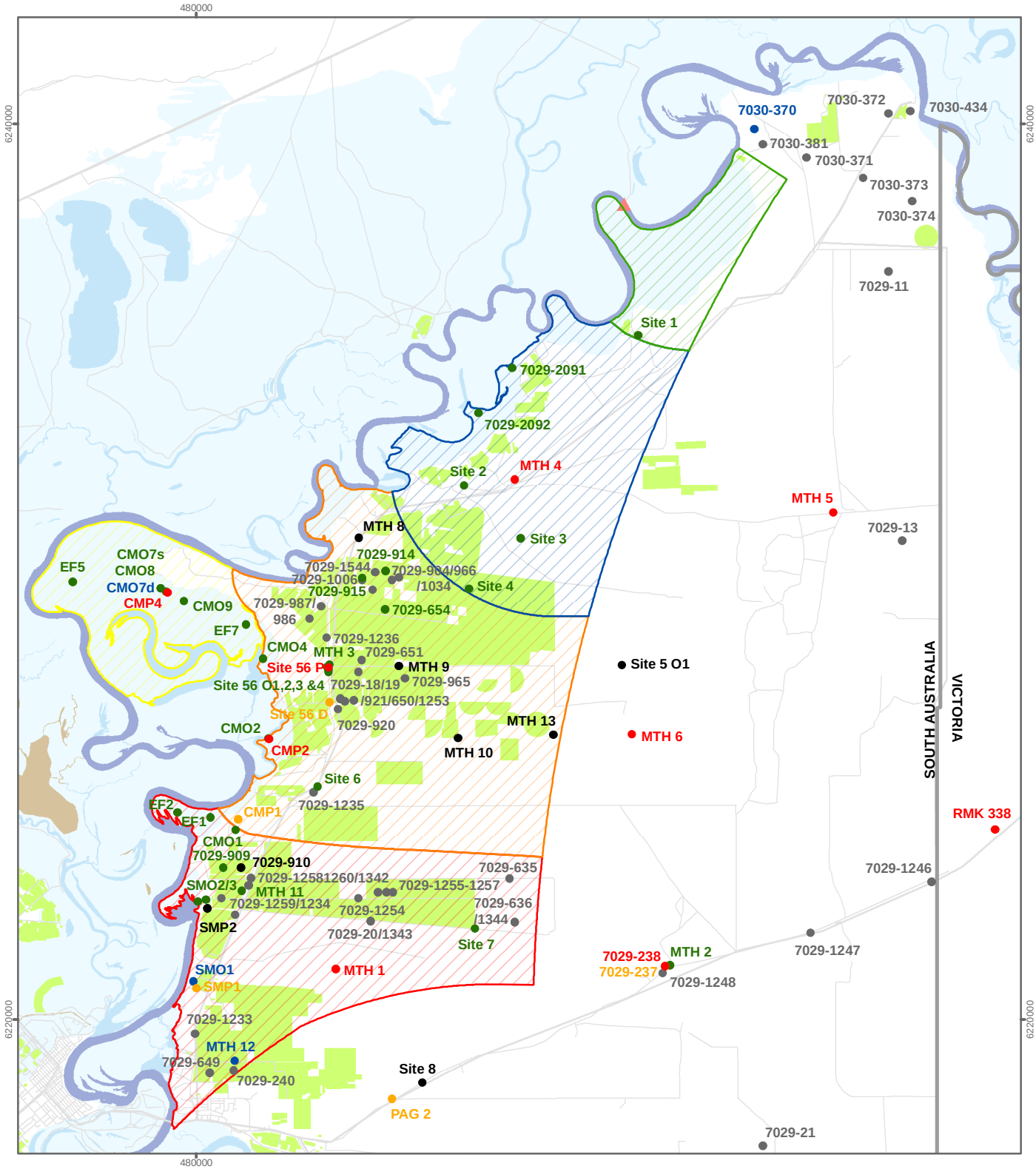
C-5. Mean and median salinity values for allocated areas at Murtho

Area	Name	Easting	Northing	Drilled	Anom	EC	TDS
A	Site 1	489874.100	6235279.900	2004	No	46500	30032
				Without including anomalous values.		Mean	30032
						Median	30032
				Including values flagged as anomalous.		Mean	30032
						Median	30032
Area	**Name**	**Easting**	**Northing**	**Drilled**	**Anom**	**EC**	**TDS**
B	Site 3	487243.000	6230748.200	2004	No	41200	26193
B	Site 4	486089.200	6229615.100	2004	No	45200	29102
B	7029-2091	487058.000	6234547.000	2005	No	34200	21254
B	7029-2092	486305.000	6233545.000	2005	No	36400	22770
B	MTH 4	487119.110	6232062.290	1973	No	N/A	30670
B	Site 2	485981.800	6231918.000	2004	Possible	45300	29166
				Without including anomalous values.		Mean	26526
						Median	27648
				Including values flagged as anomalous.		Mean	26526
						Median	27648
Area	**Name**	**Easting**	**Northing**	**Drilled**	**Anom**	**EC**	**TDS**
C	56 D	482977.200	6227083.400	2004	No	48100	31258
C	56 O1	482962.500	6227826.700	2004	No	50100	32757
C	56 O2	482962.000	6227806.700	2004	No	50100	32757
C	56 O3	482960.400	6227762.000	2004	No	52800	34785
C	56 O4	482931.500	6227863.700	2004	No	50100	32757
C	56 P	482963.500	6227861.700	2004	No	N/A	37700
C	Site 6	482715.700	6225199.300	2004	No	46700	30208
C	7029-654	484216.020	6229156.220	1981	No	47200	30579
C	7029-914	484234.130	6230018.350	1984	No	46300	29903
C	7029-915	483715.100	6229861.230	1984	No	47600	30885
C	CMO2	481610.487	6226274.475	2005–06	No	62700	43890
C	CMO4	481498.048	6228064.288	2005–06	No	51400	33710
C	CMP1	480942.032	6224466.289	2005–06	No	41100	26130
C	CMP2	481630.111	6226255.066	2005–06	No	N/A	44200
C	MTH 3	482976.000	6227924.000	1973	No	42220	26927
C	7029-1006	483712.140	6229813.210	1987	No-Data	N/A	N/A
C	7029-1034	484525.030	6229872.250	1990	No-Data	N/A	N/A
C	7029-1235	482622.190	6225078.200	1989	No-Data	N/A	N/A
C	7029-1236	482921.990	6228528.030	1989	No-Data	N/A	N/A
C	7029-1253	483220.200	6227167.290	1996	No-Data	N/A	N/A
C	7029-1544	483994.060	6229988.170	1978	No-Data	N/A	N/A
C	7029-18	483630.100	6227765.220	1973	No-Data	N/A	N/A
C	7029-19	483316.140	6227109.250	1973	No-Data	N/A	N/A
C	7029-650	483220.210	6227161.080	1977	No-Data	N/A	N/A
C	7029-651	483699.110	6228026.130	1977	No-Data	N/A	N/A
C	7029-904	484382.100	6229818.010	1981	No-Data	N/A	N/A
C	7029-920	483174.000	6226930.000	1985	No-Data	N/A	N/A
C	7029-921	483523.100	6227132.010	1985	No-Data	N/A	N/A
C	7029-965	484662.050	6227614.170	1986	No-Data	N/A	N/A
C	7029-966	483942.920	6229592.180	1986	No-Data	N/A	N/A
C	7029-986	482532.080	6228943.120	1989	No-Data	N/A	N/A
C	7029-987	482791.090	6229224.120	1989	No-Data	N/A	N/A
C	MTH 10	485848.010	6226286.020	2000	Yes	17700	10389
C	MTH 13	487973.000	6226350.000	2002	Yes	5420	3035
C	MTH 8	483636.010	6230760.000	2000	Yes	18000	10565

C	MTH 9	484521.990	6227889.040	2000	Yes	23000	13743
					Without including anomalous values.	Mean	33230
						Median	32757
					Including values flagged as anomalous.	Mean	28220
						Median	30885

Area	Name	Easting	Northing	Drilled	Anom	EC	TDS
D	CMO9	479731.899	6229343.303	2005–06	No	59200	41440
D	CMP4	479361.366	6229527.843	2005–06	No	N/A	49100
D	EF5	477240.730	6229773.789	2005–06	No	60600	42420
D	EF7	481114.305	6228817.559	2005–06	No	45500	29295
D	CMO7d	479212.671	6229624.050	2005–06	Possible	55700	38990
D	CMO7s	479214.921	6229623.229	2005–06	Possible	57200	40040
D	CMO8	479333.430	6229555.011	2005–06	Possible	68100	47670
					Without including anomalous values.	Mean	41279
						Median	41440
					Including values flagged as anomalous.	Mean	41279
						Median	41440

Area	Name	Easting	Northing	Drilled	Anom	EC	TDS
E	Site 7	486228.200	6222022.300	2004	No	50900	33332
E	7029-909	480609.060	6223391.170	1983	No	N/A	25830
E	CMO1	480879.881	6224227.991	2005–06	No	41500	26384
E	MTH 1	483120.050	6221124.190	1973	No	N/A	32596
E	MTH 11	481023.960	6222873.950	2001	No	45700	29470
E	SMO2	480218.425	6222666.590	2005–06	No	41900	26680
E	SMO3	480043.076	6222633.958	2005–06	No	32000	19721
E	7029-1233	479972.120	6219678.170	1989	No-Data	N/A	N/A
E	7029-1234	480871.990	6222328.360	1989	No-Data	N/A	N/A
E	7029-1254	483622.070	6222708.030	1987	No-Data	N/A	N/A
E	7029-1255	484062.100	6222838.190	1971	No-Data	N/A	N/A
E	7029-1256	484252.130	6222838.180	1971	No-Data	N/A	N/A
E	7029-1257	484401.950	6222838.090	1971	No-Data	N/A	N/A
E	7029-1258	481221.960	6223158.130	1971	No-Data	N/A	N/A
E	7029-1259	480562.070	6222708.040	1975	No-Data	N/A	N/A
E	7029-1260	481172.050	6222988.050	1975	No-Data	N/A	N/A
E	7029-1342	481171.990	6222988.010	2000	No-Data	N/A	N/A
E	7029-1343	483902.010	6222198.050	2000	No-Data	N/A	N/A
E	7029-1344	487121.960	6222177.950	2000	No-Data	N/A	N/A
E	7029-20	483902.130	6222198.240	1973	No-Data	N/A	N/A
E	7029-240	480846.090	6218858.140	1975	No-Data	N/A	N/A
E	7029-635	487002.120	6223148.330	1980	No-Data	N/A	N/A
E	7029-636	487122.040	6222178.280	1980	No-Data	N/A	N/A
E	7029-649	480300.050	6218807.110	1980	No-Data	N/A	N/A
E	EF1	480322.437	6224514.677	2005–06	Possible	43400	27767
E	EF2	479586.552	6224620.358	2005–06	Possible	31800	19598
E	MTH 12	480860.020	6219068.050	2001	Possible	20230	11981
E	SMO1	479947.108	6220853.380	2005–06	Possible	26400	15969
E	SMP1	480007.057	6220689.998	2005–06	Possible	28600	17448
E	7029-910	481005.090	6223386.220	1983	Yes	2650	1468
E	SMP2	480254.254	6222480.685	2005–06	Yes	13650	7896
					Without including anomalous values.	Mean	23898
						Median	26107
					Including values flagged as anomalous.	Mean	21153
						Median	22776



Locks
Roads
River Murray
Wetlands
Evaporation basins
River Murray Floodplain (1956 flood extent)
Irrigated areas (2003)

Salinity data (by well name) and Allocated Areas

! Quality is very high (eg Chem Analysis)
! Quality is high (eg prolonged pumping)
! Quality is medium (typical airlift sample)
! Quality is low (poor conditions or value)
! Data is considered anomalous
! No data found against well

A - Zone 51
B - Zone 3
C - Zones 4, 15, 16 & 17
D - Zones 13, 14 & 18
E - Zones 5, 6 & 12

0 0.6 1.2 1.8 2.4 3 Kilometres

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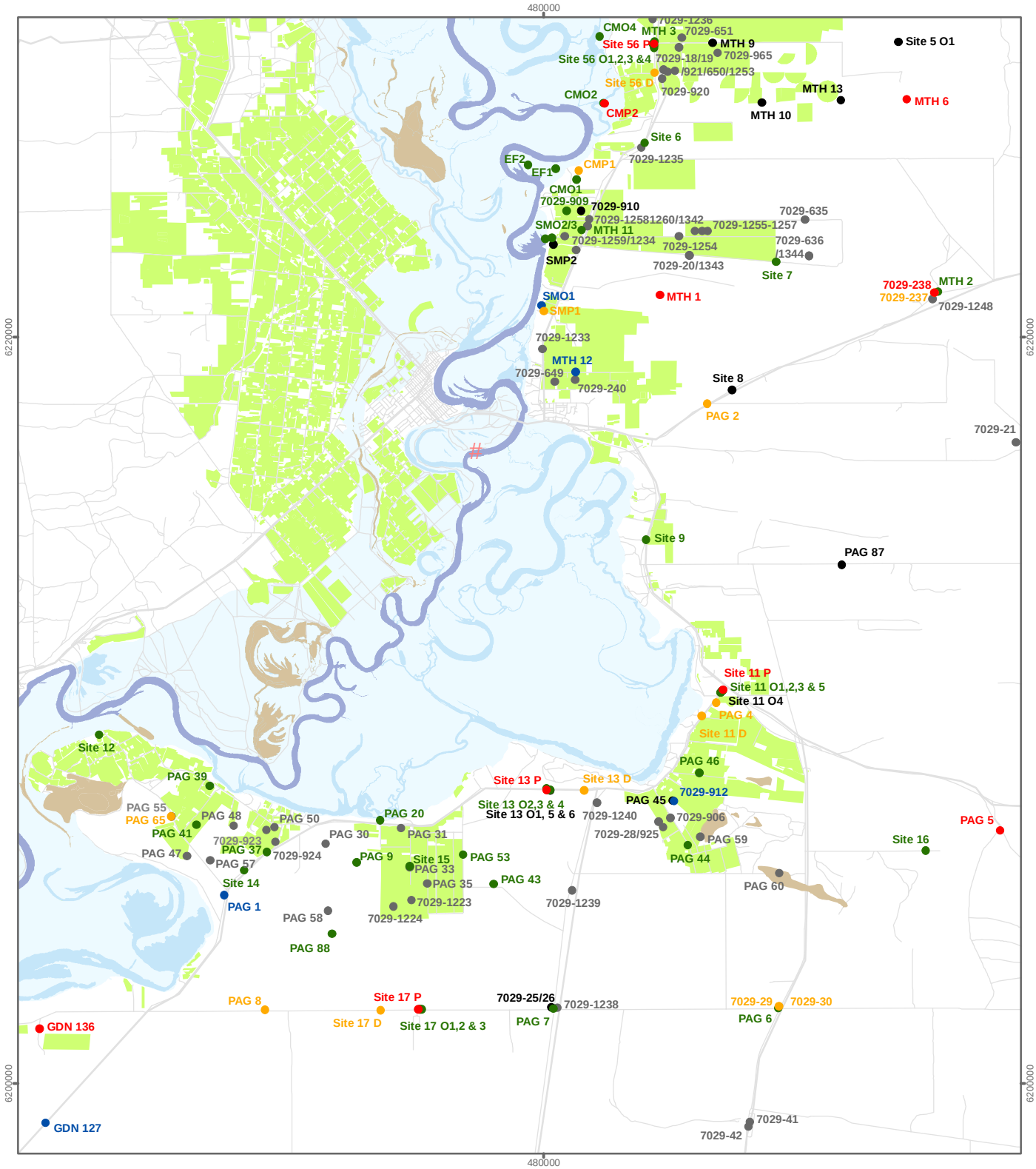
Appendix C-6: Wells used and allocated areas created for Murtho salinity analysis



Locks
Roads
River Murray
Wetlands
Evaporation basins
River Murray Floodplain (1956 flood extent)
Irrigated areas (2003)

Salinity data (by well name) and Allocated Areas

! Quality is very high (eg Chem Analysis)
! Quality is high (eg prolonged pumping)
! Quality is medium (typical airlift sample)
! Quality is low (poor conditions or value)
! Data is considered anomalous
! No data found against well

µ

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GDA

0 0.7 1.4 2.1 2.8 3.5 Kilometres

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Appendix C-7: Wells investigated for salinity data in the Pike region

C-8. Summary of pool levels along Pike River and River Murray (after REM-Aquaterra, 2005a)

River Reach	Pool Level applied to Murray River and Pike River Features in Model (RL in mAHD)
Murray River upstream of Lock 6	19.6
Murray River upstream of Lock 5	16.3
Pike River anabranch system.	
From the offtake upstream of Lock 5 downstream to Mundic Creek	15.4 to 14.8
Mundic Creek	14.8
Snake Creek from Mundic Creek to Pike River (d/s of Coombes Bridge)	14.8 to 14.3
Pike River from Mundic Creek to upstream of Coombes Bridge	14.6
Pike River from d/s of Coombes Bridge to Col Col Embankment	14.3
Pike River downstream of Col Col Embankment	13.4
Rumpagunyah Creek (d/s of bifurcation from Pike River)	13.4
Lower Pike River (d/s from bifurcation from Rumpagunyah Creek)	13.3
Murray River upstream of Lock 4	13.2
Murray River downstream of Lock 4	9.8