MURRAY FUTURES
Lower Lakes & Coorong Recovery

Acid Sulfate Soils Research Program

Lower Lakes Laboratory Study of Contaminant Mobilisation Under Seawater and Freshwater Inundation

Report 5 | May 2010

Australian Government

Government of South Australia

WATER FOR GOOD

For further information please contact:

Email: cllmm@deh.sa.gov.au

Phone: 1800 226 709 (free call during normal business hours)

Post: Coorong, Lower Lakes and Murray Mouth Program
Department of Environment and Natural Resources
Reply paid 1047
ADELAIDE SA 5001

Website: www.environment.sa.gov.au/cllmm

Permissive licence

Disclaimer

Printed on recycled paper
May 2010
ISBN 978-1-921735-10-3

Citation

This report should be cited as:

Sullivan, L.A., Bush, R.T., Ward, N.J., Fyfe, D.M., Johnston, M., Burton, E.D., Cheeseman, P., Bush, M., Maher, C., Cheetham, M., Watling, K.M., Wong, V.N.L., Maher R. and Weber, E. 2010, *Lower Lakes laboratory study of contaminant mobilisation under seawater and freshwater inundation*. Prepared by Southern Cross GeoScience for the SA Department of Environment and Natural Resources, Adelaide.

Cover image

Ewe Island Barrage March 2010 (DENR 2010)

Lower Lakes Laboratory Study of Contaminant Mobilisation Under Seawater and Freshwater Inundation

L.A. Sullivan, R.T. Bush, N.J. Ward, D.M. Fyfe, M. Johnston, E.D. Burton, P. Cheeseman, M. Bush, C. Maher, M. Cheetham, K.M. Watling, V.N.L. Wong, R. Maher and E. Weber

Prepared by Southern Cross GeoScience for the SA Department of Environment and Natural Resources

Part of the South Australian Government's $610 million Murray Futures program funded by the Australian Government's Water for the Future initiative, and the Murray-Darling Basin Authority

May 2010

Government of South Australia
Department of Environment and Natural Resources

EPA South Australia

Southern Cross GeoScience

Executive Summary

This laboratory based project aimed to provide data to help assess the potential environmental impact resulting from mobilisation of constituents of interest (i.e. acid, metals, metalloids, and nutrients) following rewetting of exposed soils around the Lower Lakes with seawater or River Murray water. The findings of this research were required to inform the preparation of a draft Seawater Inundation Environmental Impact Statement (EIS).

The specific aims of this project were to:

- Conduct laboratory mobilisation measurements on partially to fully oxidised acid sulfate soils from representative sites in the Lower Lakes.

- Assess the dynamics of contaminant release (acidity, metals, metalloids and nutrients), neutralisation of contaminants, and changes to sediment morphology, chemistry and behaviour, with particular focus on the formation and cycling of sulfur species (e.g. pyrite, monosulfidic materials, and sulfate).

- Assess the likely impacts of maintaining water levels in the Lower Lakes through the introduction of seawater as compared to River Murray water.

Water levels in the Lower Lakes of Lake Alexandrina and Lake Albert are considered to have reached critically low levels as a result of the prolonged drought, together with management practices upstream in the Murray-Darling catchment. The Lower Lakes are currently undergoing their first major drying phase since the introduction of barrages more than 50 years ago. Recent research has indicated that the Lower Lakes are being impacted by a combination of low water levels and the presence of acid sulfate soils. It has been considered that further lowering of the lakes and resulting acidification from the oxidation of acid sulfate soils may give rise to serious damage to the ecosystem of the Lower Lakes.

Opening the barrages to allow ingress of seawater to maintain water levels and prevent acidification of the Lower Lakes is being considered as a possible management strategy if the water levels and water quality fall below a critical point. It has been proposed to allow sufficient seawater through the barrages to maintain the level of Lake Alexandrina above the trigger level of 1.5 metres below sea level.

Findings

- The response of the inundating waters to the underlying soils varied considerably in terms of pH and alkalinity. The soil materials from two of the sites developed pHs < 4.0 after 136 days of inundation and an additional two soil materials developed pHs < 5.0 after 136 days of inundation. Inundation of most of the sediments did not appreciably acidify the inundating waters. Inundation by seawater generally had a greater initial acidification effect than did inundation by River Murray water suggesting that the higher alkalinity of the seawater was insufficient (under the experimental conditions) to overcome the additional exchange of acidity from the lake soils caused by the higher salinity of the seawater. At longer times of inundation the extra acidifying effect of seawater inundation relative to inundation with River Murray water, tended to diminish.

- The data thus indicates that rather than providing a source of alkalinity to help mitigate against acidification of the waters in the lakes, as had been previously discussed as a solution for acidification, that the introduction of seawater into the lakes may - especially under rewetting conditions that would result in negligible tidal exchange of seawater in the lakes - result in both greater fluxes of acidity and lower fluxes of alkalinity from inundated sediments into the inundating lake water. This would tend to enhance acidification of the waters in the lakes rather than reduce it, although this effect could be reduced or reversed depending on whether greater effective dilutions (than were used in this project) or appreciable exchanges of seawater were achieved by any adopted rewetting management practice. However, these results do not affect the possible utility of seawater to prevent oxidation and acidification of sediments other than the exposed sandy shoreline soils (i.e. the sediments at greater depth in the lake that have not yet been exposed by drying may have a greater capacity to release acidity and contaminants than the exposed sandy shoreline soils examined in these studies) should alternative sources of water be lacking.

- The acidities of the surficial (0-15 cm) soil materials were generally very low. Soil materials from only two of the fifteen sites had acidities that exceeded the value usually used to trigger further acid sulfate soil investigations. Many of the soil materials that had acidities lower than this trigger value also had very low pHs indicating that even these low pH soil materials (some with pHs as low as 2.6) have only a poor ability to supply acidity to the overlying waters. This helps to explain the general lack of acidification of the waters inundating the soil materials.

- For 73% of the soil materials examined, their inundating waters essentially maintained their prior alkalinity levels over the duration of the inundation. For the remaining soil materials the alkalinity levels of the inundating waters decreased during the inundation. The data show that the soil materials, excepting the few very acidic soil materials, were capable of producing substantial alkalinity during the 136 days of inundation. The other data showing strong sulfate depletion in these soils strongly indicate that this alkalinity is consequent of sulfate reduction during organic matter decomposition.

- Sulfides were generally at very low levels in the soil materials prior to inundation and had generally not accumulated measurably during the 35 days of inundation with either seawater or River Murray water. The longer term incubation of 136 days generally produced measurable sulfide mineral accumulation in the sediments. However the mean sulfate reduction rates both over the 136 days of inundation and at day 136 were highly variable from soil material to soil material even after this extended inundation period.

- The data indicate that the major factor limiting sulfate reduction in these sediments over the 136 days was the availability of organic carbon in the sediments rather than the availability of sulfate in the pore waters. Appreciable sulfate reduction occurred even in some of the very acidic (pH <4.0) sediments.

- There were clear differences in the effect of the inundating waters on the extent and rates of mobilisation of chemical species during the period of inundation. The data indicate that exceedances of Zn and NH_3 were much more likely in the inundating waters when those inundating waters were seawater.

- All of the inundating waters (except for those inundating the Monosulfidic Black Ooze material) exceeded the recommended water quality guidelines for Zn when seawater was used. The inundating waters for one especially acidic soil material also exceeded the recommended water quality guidelines for Zn when River Murray was used.

- The inundating waters for 40% of the sites exceeded the recommended water quality guidelines for NH_3 when seawater was used. The inundating waters for two sites also exceeded the recommended water quality guidelines for NH_3 when River Murray was used.

- The changes in flux of many soluble constituents from the sediments to the inundating waters did not usually exhibit a simple linear trend. This is likely due to the range of slowly changing biogeochemical processes that result from the progression of geochemical regimes created by inundation. In addition some soluble constituents that appear in increasing concentrations in the inundating waters during the initial inundation phase, decrease in concentration in later inundation phases. Consequently, the apparent net diffusion rates for most soluble constituents change appreciably during the inundation.

Recommendations

- It is likely that salinities other than the two tested here (i.e. River Murray water and seawater) may have produced different results in terms of fluxes of potential contaminants and acidity/alkalinity. The effect of differing salinities of inundating water will be largely a result of the management practices to effect rewetting of the lakes and this factor should be examined for range of representative lake soils.

- Although the results of this study do not support the likelihood of acidification of lake waters over the timescales of this study, there were only 15 sites examined in this study. Although these sites were carefully chosen by the Scientific Committee (based on the best advice at hand at the time the project was being planned) to best represent the exposed lake sediments, the degree of representation cannot be known with certainty without a detailed and accurate map of these sediments around the lake. It is strongly recommended that an accurate map of the extent of these exposed sandy shoreline soils based on hazard (e.g.

mapping separately those exposed soils with appreciable surficial reserves of acidity and jarosite as these showed a strong propensity in this study to release acidity and potential contaminants into the inundating waters) be produced to allow accurate modelling of the likely behaviour of the exposed sandy shoreline soils consequent of reinundation.

- There remains considerable uncertainty surrounding the flux rates of potential contaminants mobilised in these sediments. In this experiment the flux rate of these components from sediment to inundating waters were due to diffusion alone. Further studies aimed determining the flux rates from sediment to both inundating waters and groundwaters due to convective processes should be given a high priority. If these processes are significant in contaminant flux in these sediments, then the pore water data in this study suggests greater contamination of overlying water would occur. Another question that such further research needs to answer is: What proportion of the Existing Acidity contained in these soils flows out of the soil in any water flush through the soil? For example: Is it all of the Actual Acidity in that soil? Or only a portion of the Actual Acidity? What proportion of Retained Acidity flows out of the soil in any water flush through the soil? Is it all of the Retained Acidity in that soil? Or only a portion of the Retained Acidity?

- Given firstly the data indicate that the major factor limiting sulfate reduction in these sediments over the 136 days was the availability of organic carbon in the sediments rather than the availability of sulfate in the pore waters, and secondly the potential importance of sulfate reduction in relation to critical sediment/water aspects such as the development of alkalinity in the sediments, it is recommended that further investigations aimed at examining ways to enhance the organic matter contents in these sediments and the effects of such treatments on sediment behaviour be undertaken.

Finally, it is likely from the recent data provided to the Scientific Committee advising this study that the sediments at greater depth in the lake that have not yet been exposed by drying may have a greater capacity to release acidity and contaminants than the exposed sandy shoreline soils examined in these studies. Consequently in order to inform future management it is strongly recommended that similar testing to that undertaken in this study be undertaken on a representative range of these as-yet-unexposed deep clayey lake sediments after they have been air-dried so that their behaviour to reinundation by both River Murray water and seawater can be appropriately assessed.

Table of Contents

List of Figures

List of Tables

1 Project Overview

The main objective of this project is to assess the potential environmental impact resulting from mobilisation of constituents of interest (i.e. acid, metals, metalloids, and nutrients) following rewetting of acid sulfate soils with seawater or River Murray water. The findings of this research are required to inform the preparation of a draft Seawater Inundation Environmental Impact Statement (EIS). This laboratory based research project is proposed to address the first of two primary components on the potential environmental impact following rewetting of acid sulfate soils with seawater or River Murray water proposed by the South Australia Environmental Protection Agency (EPA).

2 Aims

The aims of this project were to:

- *Conduct laboratory mobilisation measurements on partially to fully oxidised acid sulfate soils from representative sites in the Lower Lakes.*

- *Assess the dynamics of contaminant release (acidity, metals, metalloids and nutrients), neutralisation of contaminants, and changes to sediment morphology, chemistry and behaviour, with particular focus on the formation and cycling of sulfur species (e.g. pyrite, monosulfidic materials, and sulfate).*

- *Assess the likely impacts of maintaining water levels in the Lower Lakes through the introduction of seawater as compared to River Murray water.*

3 Introduction and background

3.1 Introduction

Water levels in the Lower Lakes of Lake Alexandrina and Lake Albert have reached critically low levels as a result of the prolonged drought, together with management practices upstream in the Murray-Darling catchment. The Lower Lakes are currently undergoing their first major drying phase since the introduction of barrages more than 50 years ago (Simpson *et al.* 2008). Recent research has shown that the Lower Lakes are being impacted by a combination of low water levels and the presence of acid sulfate soils (Fitzpatrick *et al.* 2008). Further lowering of the lakes and resulting acidification from the oxidation of acid sulfate soils may give rise to serious damage to the ecosystem of the Lower Lakes.

Opening the barrages to allow ingress of seawater to maintain water levels and prevent acidification of the Lower Lakes is being considered as a possible management strategy, if the water levels and water quality fall below a critical point. It has been proposed to allow sufficient seawater through the barrages to maintain the level of Lake Alexandrina above the trigger level of 1.5 metres below sea level.

The South Australian Environmental Protection Agency (EPA) is currently preparing an Environmental Impact Statement (EIS) outlining the potential impact of opening the barrages and allowing seawater into the Lower Lakes. Approval to open the barrages will enable a rapid response if the critical point is reached.

This research project aims to address the first of the two primary components on the potential environmental impact following rewetting of acid sulfate soils with seawater or River Murray water proposed by South Australian EPA. In this study the potential environmental impact resulting from mobilisation of constituents of interest (i.e. acid, metals, metalloids, and nutrients) following rewetting of acid sulfate soils with seawater or River Murray water will be studied in the laboratory. A field mobilisation research project will also be conducted by CSIRO.

3.2 Background on acid sulfate soils and monosulfidic black ooze (MBO)

3.2.1 Acid sulfate soils

Recent studies have shown acid sulfate soils are widely distributed within the Lower Lakes region of South Australia (Fitzpatrick *et al.* 2008; Simpson *et al.* 2008; Sullivan *et al.* 2008). Acid sulfate soils contain, or once contained prior to their oxidation, iron sulfides in the form of disulfides (i.e. pyrite) and monosulfides. Pyrite (FeS_2) is the dominant sulfide in acid sulfate soil, although other sulfides including the iron disulfide marcasite (Sullivan and Bush 1997; Bush 2000) and iron monosulfides (Bush and Sullivan 1997; Bush *et al.* 2000) can also be found.

Sulfidic sediments accumulate under waterlogged conditions where there is a supply of sulfate, the presence of metabolisable organic matter and iron containing minerals (Dent 1986). Under reducing conditions sulfate is bacterially reduced to sulfide, which reacts with reduced iron to form iron sulfide minerals. These sulfide minerals are generally stable under reducing conditions, however, on exposure to the atmosphere the acidity produced from sulfide oxidation can impact on water quality, crop production, and corrode concrete and steel structures (Dent 1986). In addition to the acidification of both ground and surface waters, a reduction in water quality may result from low dissolved oxygen levels when monosulfidic materials are mobilised into the water column (Sammut *et al.* 1993), high concentrations of aluminium and iron (Ferguson and Eyre 1999), and the mobilisation of other potentially toxic metals and metalloids (Preda and Cox 2001; Sundström *et al.* 2002). Mobilisation may also result in the release of nutrients into the water column (Sullivan *et al.* 2008) which could contribute to algal blooms. In severe cases, these risks can potentially lead to damage to the environment, and have impacts on water supplies, and human and livestock health.

3.2.2 Monosulfidic black ooze (MBO)

Recent studies have shown that monosulfidic black oozes (MBOs) from the Lower Lakes region of South Australia were capable of mobilising high concentrations of a wide range of contaminants (Sullivan *et al.* 2008).

MBO is a distinctly black (10YR 2/2), organic sediment that has an ooze-like consistency and contains iron monosulfide minerals (Sullivan and Bush 2000). MBO from acid sulfate soil landscapes were first described and systematically examined by Sullivan and Bush (2000) who showed that the abundance of sedimentary acid volatile sulfide (AVS: a measure of monosulfides) in drains in acid sulfate soil landscapes can greatly exceed levels reported from other benthic environments.

The properties of MBO are highly variable and their blackness is usually a poor indicator of their sulfide content, or other geochemical properties. Iron monosulfides are a major contributor to the black appearance of MBO but, as iron monosulfides are nano-crystalline, it takes only a small amount to create the blackness. A range of MBOs of a similar appearance were found to have vastly differing sulfur geochemical properties, with iron monosulfide contents (quantified as AVS), ranging from approximately 100 - 1000 µmol g^{-1} (Burton *et al.* 2006b).

MBOs in acid sulfate soil landscapes have been shown to have important environmental consequences. MBOs are capable of causing rapid and severe deoxygenation of water bodies in those landscapes and subsequently (after a few days) the eventual severe acidification of those waters (Sullivan and Bush 2000; Sullivan *et al.* 2002; Burton *et al.* 2006a), and in the mobilisation of metals as a result of that acidification (Burton *et al.* 2006a).

3.3 Inundation of acid sulfate soils

Inundation with freshwater has often been proposed to improve the water quality in acid sulfate soil landscapes (Dent 1986), however, the response of acid sulfate soils to submergence is reported to be highly variable (Ponnamperuma *et al.* 1973; Tuong 1993; Konsten *et al.* 1994; Johnston *et al.* 2005). In addition to aiming to prevent further sulfide oxidation, inundation often removes the acidity in partially-oxidised sediments as the acidity gets consumed from the reduction of iron (III) oxides, sulfates and other oxidised species by anaerobic bacteria (Dent 1986). In most moderate acid soils, reduction causes the pH to rise to approximately 7 within a few weeks, however, some acid sulfate soils may not reach a pH of more than 5 after months of submergence (Ponnamperuma 1972). Factors which have been identified as being responsible for slow reduction, and hence a slow increase in pH, include a low content of easily oxidisable organic matter, a low content of easily reducible iron, a low dissolved sulfate concentration, the adverse effect of low pH on activity of microbes, and a poor nutrient status (Ponnamperuma, 1973; van Breemen, 1976; Berner, 1984).

While the increase in pH from reduction may improve water quality, recent studies have shown that the inundation of sulfuric soil materials from the Lower Lakes with freshwater was capable of mobilising high concentrations of contaminants (Simpson *et al.* 2008). The inundation of sulfuric soil materials from the Lower Lakes lead to the chemical reduction of iron minerals and caused the mobilisation of high concentrations of metals (i.e. Al, As, Cu, Mn, Ni, Ag, Cd, Cr, Co) and nutrients (i.e. NH_3, NO_X) (Sullivan *et al.* 2008). Sullivan *et al.* (2008) also found that while oxic suspensions of MBOs from the Lower Lakes did not result in acidification, there was still the mobilisation of various metals and nutrients to high concentrations.

The inundation of acid sulfate soils with seawater may show similar trends to that observed with freshwater, particularly as the mobilisation of various constituents is usually greatly influenced by the biogeochemical processes that result from progression of redox regimes created by inundation. However, this management strategy has rarely been applied on a large scale. Tidal inundation has been utilised to manage acid sulfate soils at East Trinity inlet, Cairns (e.g. Johnston *et al.* 2009a,b,c, 2010a,b; Keene *et al*. 2010).

Johnston and co-workers found regular tidal inundation over a five year period at East Trinity inlet led to substantial improvements in a range of key parameters used to assess soil and water quality. The pH of estuarine creeks increased following reintroduction of tidal inundation (e.g. Figure 3-1). Tidal exchange with seawater supplies bicarbonate alkalinity that will neutralise some acidity. The soil pH was also observed to increase by 2-3 units and titratable actual acidity (TAA) decreased (by approximately 40-50 µmol H^+ g^{-1}) within former sulfuric horizons following inundation (e.g. Figure 3-2) (Johnston *et al.* 2009c). This decrease in soil acidity is likely due to a combination of seawater alkalinity inputs together with iron and sulfate reduction generating alkalinity (Johnston *et al.* 2009c). Considerable pyrite reformation (e.g. Figure 3-2) and accumulation of acid volatile sulfide (AVS) within the soil was also observed. In addition, there were large decreases in water-soluble and exchangeable Al fractions within former sulfuric horizons, which is an important finding from an eco-toxicology perspective (Johnston *et al.* 2009a).

The hydrological and geochemical changes initiated by tidal inundation had profound consequences for the fate, mobilisation, redistribution and transformation of Fe minerals and co-associated trace elements. There was substantial diagenetic enrichment of poorly crystalline Fe-oxides near the soil surface following tidal inundation. This was also associated with enrichment of some trace metals (As and Cr) (Keene *et al*. 2010). High concentrations of As were observed in pore-waters (~300 µg L^{-1}) and were associated with reductive dissolution of secondary iron minerals, including jarosite (see Figure 3-3), which had formed during the previous oxic / acidic phase. This study demonstrated that marine tidal inundation can be an effective method for remediating acid sulfate soils at a landscape-scale. However, there are a range of potential geochemical complexities which need to be considered prior to implementing this technique.

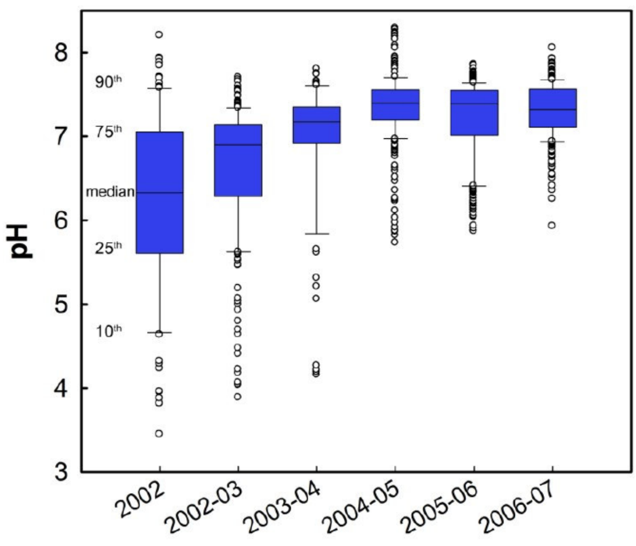

Figure 3-1. Improvements in surface water pH over time at Firewood Creek following the reintroduction of tidal exchange / inundation (source: Johnston *et al.* 2009c).

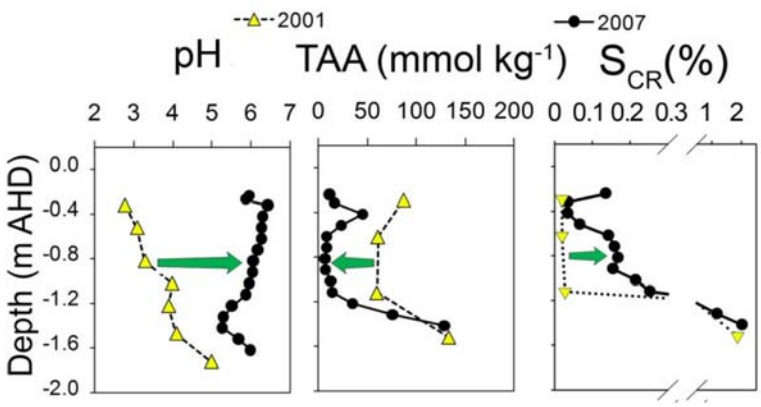

Figure 3-2. Examples of changes in key soil properties before (2001) vs. after (2007) reintroduction of tidal inundation. Arrows represent direction of change (source: Johnston *et al.* 2009c).

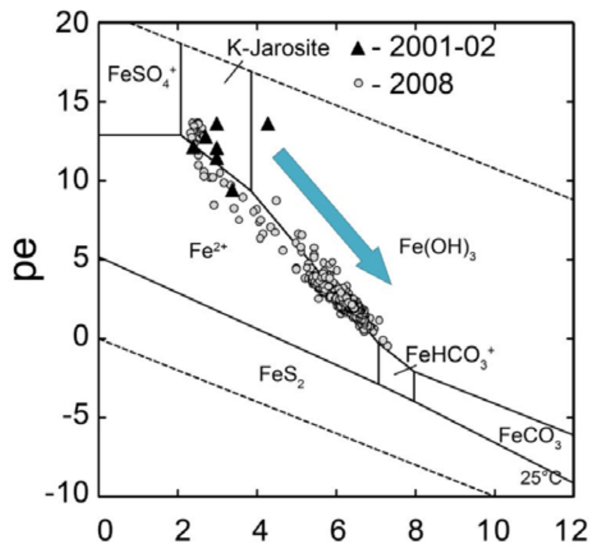

Figure 3-3. pE-pH diagram for pore-water before (2001-02) and after (2008) tidal inundation. Stability fields of relevant Fe species are shown with an arrow indicating the direction of change (source: Johnston *et al.* 2009c).

4 Materials and methods

4.1 Sampling strategy design & site inspection

This study involved of a 5 day field investigation by Professor Leigh Sullivan, Dr Nicholas Ward, Max Johnston, and Mick Cheetham. The scientific approach - including sampling strategy and sampling locations - and plan for this investigation was approved in June 2009 by the Lower Lakes Scientific Committee prior to sampling.

Leigh Sullivan and Richard Bush took part in an intensive field reconnaissance of the 15 sites to be sampled. Where practical the sites and sediments used in these experiments were the same as those planned to be sampled in the near future by CSIRO.

The sediment and water sampling sites at the Lower Lakes are presented below in Figure 4-1.

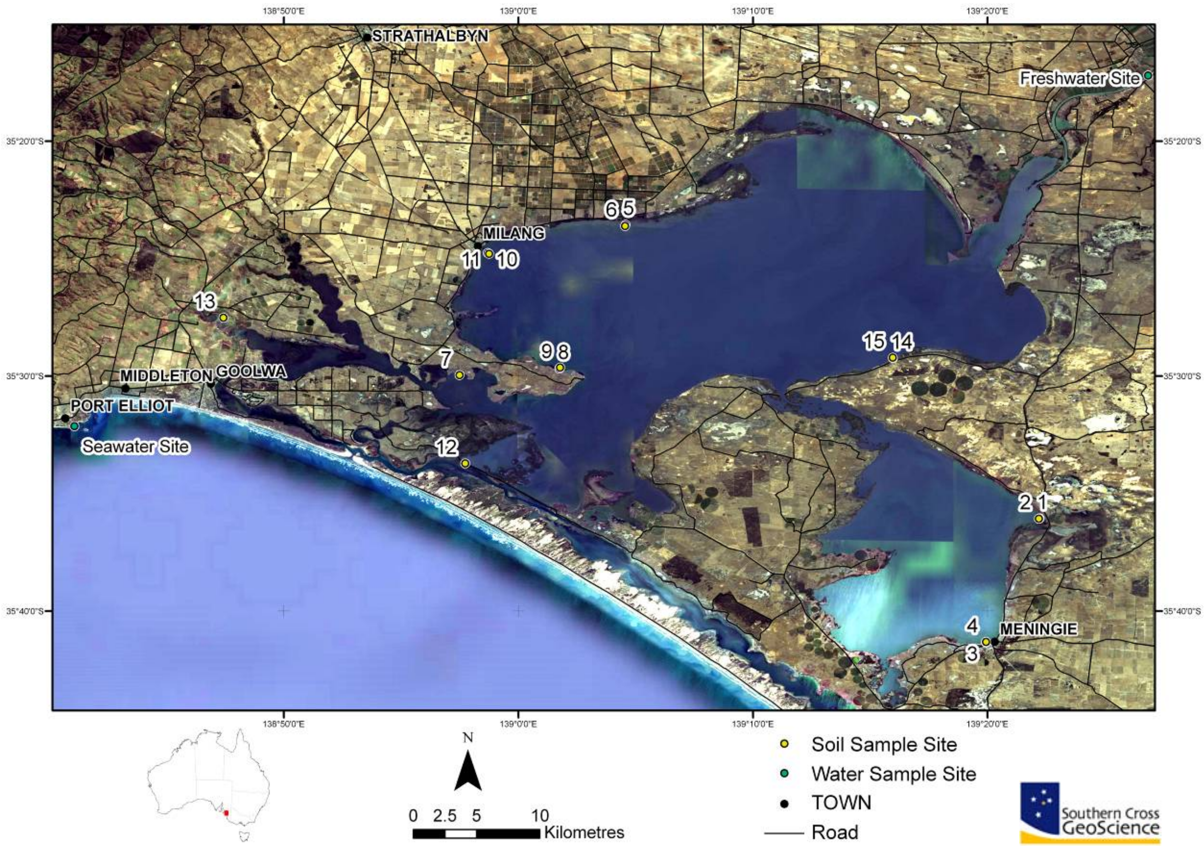

Figure 4-1. Map showing sediment and water sampling sites in the Lower Lakes.

4.2 Sampling and analysis methodology

4.2.1 Field sampling of soils

Field sampling at the Lower Lakes sites was undertaken between 12th and 16th June 2009. A total of 180 sediment cores were collected to assess the potential environmental impact resulting from mobilisation of constituents of interest (i.e. acid, metals, metalloids, and nutrients) following rewetting of acid sulfate soils with seawater or River Murray water.

Representative sediment profiles were collected from 15 sites within the Lower Lakes including 4 sites at Lake Albert (Sites 1-4), 9 sites at Lake Alexandrina (Sites 5-11, 14 and 15), 1 site at Currency Creek (Site 13), and a MBO material was collected from Ewe Island Barrage (Site 12) (Figure 4-1).

The lake shore was surveyed at each location to ensure that the sampling site occurred at an elevation within 0 to -1.0 meters AHD. Where 2 sites were sampled at a location the profiles were chosen at approximately -0.3 and -0.7 meters AHD. The Ewe Island Barrage site (Site 12) was not surveyed as the MBO materials sampled at this site were inundated at the time of sampling.

To ensure that the sampling location at each site in this study was representative of the sediments in the immediate surrounding area, 15 surface (0-15 cm) sub-samples were collected from a 10 by 20 meter grid at each location. A 1:5 soil:distilled water extract of each sub-sample was shaken for 2 minutes and then allowed to settle for 5 minutes. The pH and electrical conductivity (EC) were measured using calibrated electrodes linked to a TPS 90-FLMV multi-parameter meter. The site with the median pH was then selected to be sampled provided the conductivity at the site was also typical for that location. The pH and EC results for each grid are presented in Tables 9.2 - 9.16 (Appendix 2).

Twelve intact sediment cores (0-15 cm) were retrieved at each site. The columns used to collect each core were 50 cm in length with an internal diameter of 15 cm (Figure 4.2). A soil pit was also dug at each site and a soil description together with pH/EC data for each horizon is presented in Appendix 1. The global positioning system (GPS) coordinates for each site are also presented in Appendix 1. Photographs of the landscape at each location and the surface soil profile at each site are presented in Section 5.1. Shoreline cross-sections are also presented in Section 5.1.

Figure 4-2. Sediment sampling at Currency Creek (Site 13).

4.2.2 Field sampling of seawater and River Murray water

Seawater and River Murray water were collected from the Lower Lakes region for the laboratory inundation experiments. A total of 480 litres of Southern Ocean seawater was collected on 15th June 2009 from the pier next to Port Elliot S.L.S.C. River Murray water (495 litres) was collected on 16th June 2009 downstream from Fred's Boat Ramp between Wellington and Tailem Bend (E 0358818, N 6094051). Water was collected in 15 litre plastic containers which were rinsed thoroughly with seawater/Murray River water before each sample was collected. Additional quantities of seawater and River Murray water were subsequently sampled by the South Australia Environmental Protection Agency (EPA) and sent to the laboratory in Lismore NSW to maintain water levels in the inundation sediments.

4.2.3 Simulation of inundation of soil materials

Laboratory experiments simulating inundation were undertaken to assess the likely impacts of maintaining water levels in the Lower Lakes through introduction of seawater as compared to River Murray water. These experiments were designed to assess the dynamics of contaminant release (acidity, metals, metalloids and nutrients), neutralisation of contaminants, and changes to sediment morphology, chemistry and behaviour, with particular focus on formation and cycling of sulfur species (e.g. pyrite, monosulfidic material, sulfate).

On return to the Southern Cross GeoScience laboratory the largely unsaturated sediment cores collected from the Lower Lakes were inundated with either seawater or unfiltered River Murray water to a depth of 30 cm and capped by foil. Sediment samples were taken at the start of the inundation experiment before inundation, and after 5 weeks of inundation with seawater/River Murray water. Sediment samples were collected from 3 depths (i.e. 0-4 cm, 4-8 cm, and 8-15 cm) from duplicate cores inundated with seawater/River Murray water and immediately frozen.

Surface water and pore-water samples were taken for analysis for each inundation treatment (i.e. seawater and River Murray water) at 7 sampling times over a 5 week period (i.e. 2 hr, 4 days, 7 days, 11 days, 18 days, 25 days and 35 days). This monitoring strategy provides an estimate of the initial, fast flux of acidity and contaminants to the water column, followed by slower diffusive transport rates and possible neutralisation (mineral and redox) processes. An additional sampling time (after 136 days of inundation) was added to allow examination of longer term changes in surface and pore-waters. This extended sampling time also allowed the sulfate reduction rates to be estimated by examination of the rate of Reduced Inorganic Sulfur accumulation in the three sediment depth layers.

Surface water samples were collected from mid-depth (i.e. 15 cm above the sediment surface) from duplicate River Murray water and seawater columns for each site. Columns containing only River Murray water or seawater (i.e. no sediment) were also sampled as controls. Duplicate pore-water samples were also collected from 2 sediment layers (3-5 cm and 10-12 cm depth). To obtain the pore-waters perforated plastic tubes were inserted to the sediments at the 2 depths prior to inundation. Pore-water was removed using a syringe attached to a 0.45 µm filter.

The water column overlying the sediment cores was regularly oxygenated to simulate field mixing conditions. The dissolved oxygen concentration was measured in the water columns at regular intervals, and columns were bubbled with oxygen to maintain the dissolved oxygen level at approximately 80% saturation. Replacement of seawater/River Murray water lost through evaporative and analysis aliquot water losses was made after at each sampling date. The columns were maintained at a constant temperature of 21±1°C.

The overlying water and depth profiled pore-water samples collected were analysed for key geochemical parameters (e.g. pH, acidity/alkalinity, Fe(II)/Fe(III), Mn, Al, SO_4, Cl, major ions, metals, metalloids, and nutrients/carbon/sulfur species). The sediments were also analysed for key geochemical parameters (e.g. acidity, sulfur species, metals, metalloids and nutrients). The parameters measured are discussed further in the next section.

The effects of evaporation on concentration were examined using Cl as a conservative tracer in blank columns (see Figure 9-1, Appendix 8). This data shows minimal change in Cl concentration over time, especially in the seawater column, indicating minimal evaporative losses over the 136 days.

4.2.4 Laboratory analysis methods

4.2.4.1 General comments

All laboratory glassware and plastic-ware were cleaned by soaking in 5% (v/v) HNO_3 for at least 24 hr, followed by repeated rinsing with deionised water. Reagents were analytical grade and all reagent solutions were prepared with deionised water (milliQ). All solid-phase results are presented on a dry weight basis (except where otherwise noted).

4.2.4.2 Sediment analyses

Sediments samples collected on Day 0, Day 35 and Day 136 were immediately frozen upon sampling. The reduced inorganic sulfur (RIS) fraction was determined using the chromium reduction analysis method of Burton *et al.* (2008b). The acid-volatile sulfide (AVS) and elemental sulfur were determined using a sequential extraction procedure on duplicate frozen sub-samples. The AVS fraction was initially extracted via a cold diffusion procedure, with the use of ascorbic acid to prevent interferences from Fe (III) (Burton *et al.* 2007). In the second step the elemental sulfur fraction was extracted using toluene as a solvent and quantified by high-performance liquid chromatography (HPLC) (McGuire and Hamers 2000). The di-sulfide content (i.e. pyritic sulfur) was determined from the difference between the total RIS fraction and the measured AVS and elemental sulfur fractions.

The sediment moisture content was determined by weight loss due to drying at 105°C. Sediments for further analysis were oven-dried at 80°C and sieved (< 2 mm) prior to being ring mill ground. Electrical conductivity (EC) was determined by direct insertion of calibrated electrodes into a 1:5 soil:water extract linked to a TPS WP-81 meter.

Total carbon (%C) and total nitrogen (%N) were measured on powdered oven-dried (80°C) samples by combustion using a LECO-CNS 2000 analyser. The organic carbon content was also determined by a LECO-CNS 2000 analyser following the removal of inorganic carbon by treatment with 6.0 M hydrochloric acid (HCl). Total sulfur (%S) was measured by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry) following hot acid digestion.

The KCl extractable pH (pH_{KCl}) was measured in a 1:40 1.0 M KCl extract (Method Code 23A), and the titratable actual acidity (TAA) (i.e. sum of soluble and exchangeable acidity) was determined by titration of the KCl extract to pH 6.5 (Method Code 23F) (Ahern *et al.* 2004). TAA is a measure of the actual acidity in soil materials. The acid neutralising capacity (ANC_{BT}) was quantified using a standard back-titration determination (Method Code 19A2) (Ahern *et al.* 2004).

Major cations and anions (Na^+, K^+, Ca^{2+}, Mg^{2+}, SO_4^{2-}, Cl^-) in a 1:5 soil:water extract were analysed by ICP-OES. Total metal and metalloid concentrations were determined by aqua-regia (HNO_3:HCl) digestion. Reactive iron and trace element fractions were extracted using 1.0 M HCl. Metals and metalloids (Al, Fe, Mn, As, Cu, Ni, Zn, Cd, Co, Cr, Pb) were analysed using ICP-MS (Inductively Coupled Plasma - Mass Spectrometry).

4.2.4.3 Surface and pore-water analyses

Redox potential (Eh) and pH were determined using calibrated electrodes linked to a TPS 90-FLMV multi-parameter meter. Eh and pH were measured on unfiltered surface water samples, and all other properties were determined on filtered (0.45 µm) water samples.

Ferrous iron (Fe^{2+}), total iron (Fe^{2+} + Fe^{3+}), alkalinity and dissolved sulfide were fixed immediately after sampling. The ferrous iron trap was made up from a phenanthroline solution with an ammonium acetate buffer (APHA 2005), and the total iron trap also included a hydroxylamine solution (APHA 2005). The ferric iron (Fe^{3+}) fraction was calculated from the difference between the total iron and ferrous iron fractions. Bromophenol blue traps were used for alkalinity (Sarazin *et al.* 1999) and alkalinity standards were determined with 0.01M HCl using the Gran procedure (Stumm and Morgan 1996). The dissolved sulfide fraction was trapped in an alkaline zinc acetate trap, and quantified by the methylene blue method (APHA 2005). The iron species, alkalinity and dissolved sulfide were all quantified colorimetrically using either a Cary 50 fibre optic coupler connected to a Varian UV-visible spectrophotometer or a Hach DR 2800 spectrophotometer.

Nutrients (orthophosphate, nitrate, nitrite, and ammonia) were analysed turbidimetrically using FIA colorimetry (Lachat QuikChem 8000) (APHA 2005). The dissolved organic carbon (DOC) content was analysed using an O.I. Analytical Aurora 1088 Wet Oxidation TOC Analyser following the APHA 5310 B high-temperature combustion method (APHA 2005).

Major cations and anions (Na^+, K^+, Ca^{2+}, Mg^{2+}, SO_4^{2-}, Cl^-) were analysed by ICP-OES and all other metals (Al, Fe, Mn, As, Cu, Ni, Zn, Cd, Co, Cr, Pb) were analysed using ICP-MS. All filtered water samples analysed for metals by ICP were acidified on sampling with a couple of drops of concentrated nitric acid (HNO_3) for preservation.

4.2.4.4 Sulfate reduction analyses

In-situ SO_4^{2-}-reduction rates (SRR) were determined at day 136 of the inundation using a radiotracer ($^{35}SO_4^{2-}$) incubation method (Jakobsen and Postma 1999). Four replicate intact soil sub-samples were collected from a single SW- or MW-treated core at the 0-4 cm and 4-8 cm depth intervals, using 3 mL polypropylene syringes (with the distal end removed). After collection, each soil sample was immediately sealed within the 3 mL syringe using Parafilm and was subsequently injected with 100 kBq of carrier-free $^{35}SO_4^{2-}$. Three of the 4 replicates from each depth interval were incubated at ambient temperature for 24 hrs. These incubations were terminated by mixing the soil with 10 mL of 20% Zn acetate. In addition to the triplicate 24 h incubations, a single replicate for each soil sample also served as a time zero blank (i.e. this sample was mixed with the Zn acetate solution immediately after injection of $^{35}SO_4^{2-}$). The radiolabelled Zn acetate-preserved samples were stored frozen at -80°C. Reduced inorganic S-35 was extracted using the Cr(II)-reduction method of Burton *et al.* (2008b). The radioactivity of this extract was determined by liquid-scintillation counting using a Perkin-Elmer microbeta counter (with Perkin-Elmer UltimaGold scintillation fluid). The SRR was determined according to:

$$SRR = \frac{a-b}{A}\left[SO_4^{2-}\right]\frac{1}{d} \bullet 1.06 \text{ nmol/cm}^3\text{/day}$$

Where ***a*** is the radioactivity of the reduced inorganic sulfur (RIS) extract per volume of soil subjected to the incubation, ***b*** is the radioactivity of the corresponding time zero blank, ***A*** is the radioactivity of the of added $^{35}SO_4^{2-}$ per volume of soil, [SO_4^{2-}] is the sulfate concentration per volume of soil (nmol/cm^3), ***d*** is the incubation time in days, and 1.06 is the isotopic fractionation factor. Determination of the time zero blank yielded similar values for the 3 RIS species values of 61 ± 15 cpm (mean ± standard deviation for all blank measurements, n = 225). Therefore, the SRR was considered detectable only when (***a*** – ***b***) was greater than two times the standard deviation (i.e. 30 cpm) (Fossing *et al.* 2000).

4.2.4.5 Expression of results

The means (Av.) and the range for duplicates (±) are presented in the tables in this document with graphs given to illustrate certain points. The limit of detection (LOD) of some metals is higher for saltwater/saline water samples due to potential interferences (see Table 4-3).

Table 4-1. Metal and metalloid limits of detection for freshwater and saltwater/saline water samples using ICP-MS.

Metal/Metalloid	Freshwater Detection Limit (ppb)	Seawater/Saline water Detection Limit (ppb)
Aluminium (Al)	<10	<10
Iron (Fe)	<10	<10
Manganese (Mn)	<10	<10
Arsenic (As)	<1	<15
Copper (Cu)	<1	<1
Nickel (Ni)	<1	<5
Zinc (Zn)	<1	<5
Cadmium (Cd)	<0.1	<0.1
Cobalt (Co)	<1	<1
Chromium (Cr)	<1	<4.4
Lead (Pb)	<1	<1

The results from these analyses can be found in the Section 5.3 of this report. Water quality guidelines for freshwater have been used in the results tables for inundations using River Murray water for comparison purposes. For pore-waters caution must be exercised when using these guidelines. On the advice from the South Australian Environment Protection Authority, the 80th percentile values of the water quality guidelines were, after correction for water hardness, used to evaluate the quality of the surface and pore-waters in this study (see Table 9-796 in Appendix 9).

4.2.4.6 Quality control of analyses

The metal, metalloid, anion/cation and nutrient analyses were conducted by a NATA-accredited laboratory. The accuracy and precision of the analytical data were determined using standard procedures.

Blanks were collected for laboratory or field samples to examine whether contaminants had been introduced to the sample. Reagent blanks and method blanks were prepared and analysed for each method. All blanks examined here were either at, or very close to, the limits of detection.

Calibrations were performed on matrix-matched solutions and these were analysed along with standard solutions and the tested analytes. These calibrations and checks confirmed the methodology and the proper functioning of the analytical instruments.

Duplicates were prepared for all experiments and analysed separately. The exception to this was for the sediment samples collected on Day 35 where - for selected parameters - duplicate analyses were carried out on at ~20% of samples collected. Selected analytical duplicate samples were prepared by dividing a test sample into two, then analysing these sub-samples separately.

On average, the frequencies of quality control samples processed were: 5% blanks, 5% laboratory duplicates, and 10% laboratory controls. The analytical precision was ±5% for all analyses**.**

5 Results

5.1 Lower Lakes site characteristics

Locations sampled in this study were uniformly flat with either a vegetation cover of sedges and grasses (e.g. Figure 5-1) or more typically a lack of vegetation cover (e.g. Figure 5-10). The textures of the surface soil materials sampled for this study (i.e. 0 – 15 cm layer) were light-medium sand (Appendix 1). With the exception of Ewe Island Barrage (Site 12), surface water was absent from all sampling sites. Monosulfidic black ooze (MBO) was also only observed at Ewe Island Barrage (Site 12) at the time of sampling.

Photographs of the landscape at each of the sampling locations and the surface soil profile at each site are presented in sections 5.1.1 to 5.1.9. Shoreline cross-sections at all sites, except Ewe Island Barrage (Site 12) which was under water at the time of sampling, are also presented.

5.1.1 Waltowa, Lake Albert site characteristics (Site 1 and 2)

Figure 5-1. Landscape at the Waltowa sampling location.

Figure 5-2. Surface soil profiles at Site 1 (left photograph) and Site 2 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

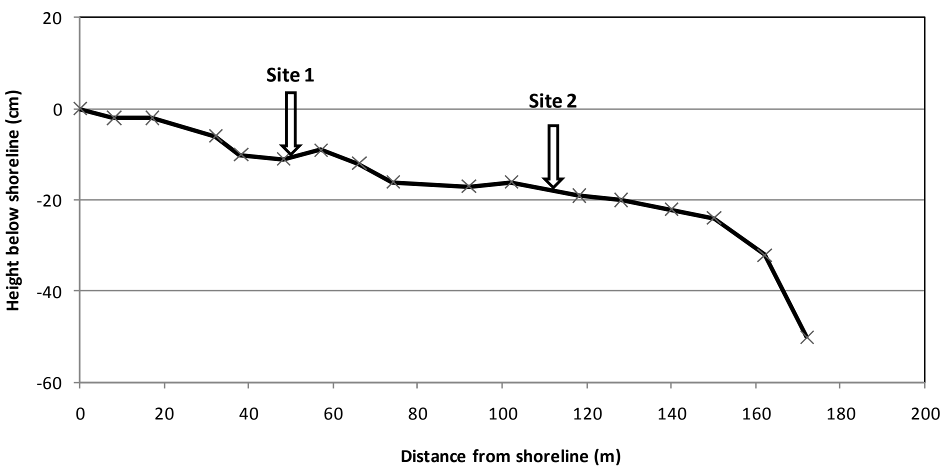

Figure 5-3. Shoreline cross-section at Site 1 and 2.

5.1.2 Meningie, Lake Albert site characteristics (Site 3 and 4)

Figure 5-4. Landscape at the Meningie sampling location (Site 3).

Figure 5-5. Surface soil profiles at Site 3 (left photograph) and Site 4 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

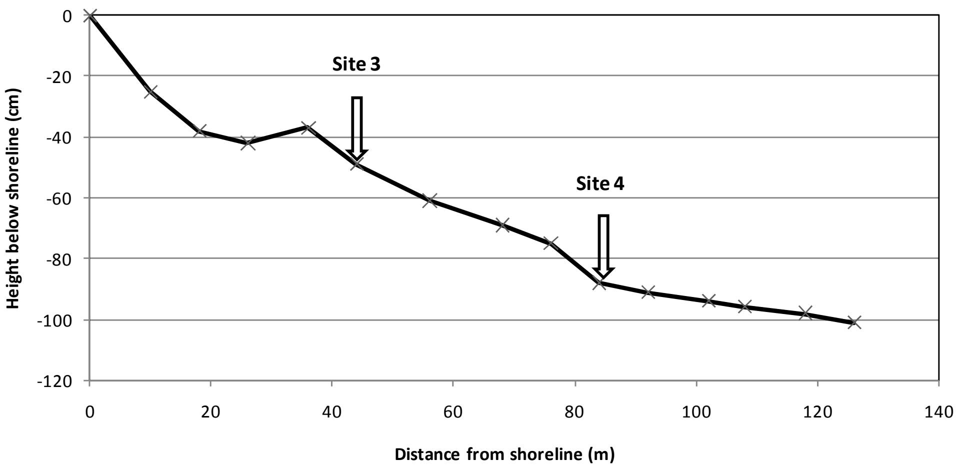

Figure 5-6. Shoreline cross-section at Site 3 and 4.

5.1.3 Tolderol, Lake Alexandrina site characteristics (Site 5 and 6)

Figure 5-7. Landscape and surface soil profile at Tolderol (Site 5).

Figure 5-8. Surface soil profiles at Site 5 (left photograph) and Site 6 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

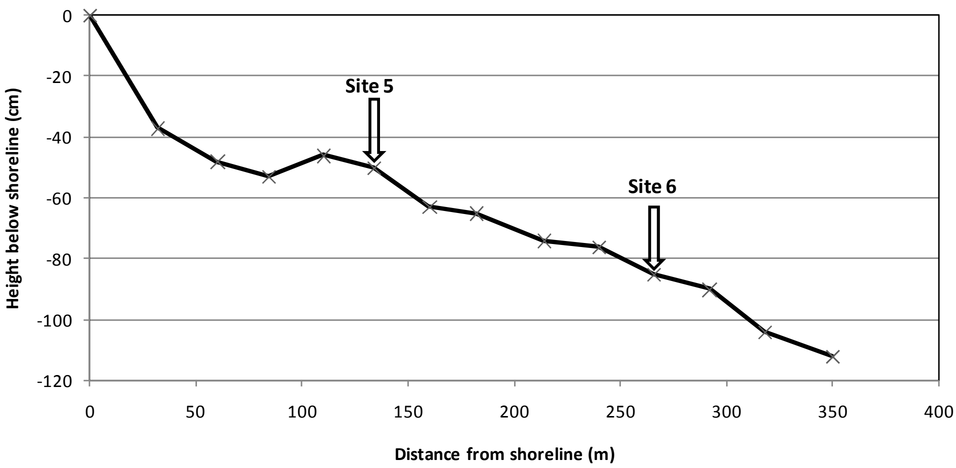

Figure 5-9. Shoreline cross-section at Site 5 and 6.

5.1.4 Point Sturt (South), Lake Alexandrina site characteristics (Site 7)

Figure 5-10. Landscape and soil profile at Point Sturt (South) (Site 7). A profile description at this site is presented in Appendix 1.

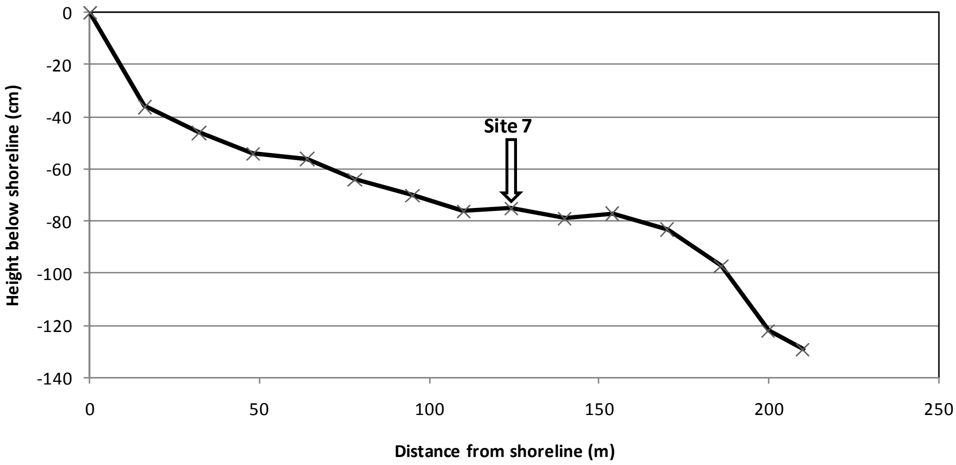

Figure 5-11. Shoreline cross-section at Site 7.

5.1.5 Point Sturt (North), Lake Alexandrina site characteristics (Site 8 and 9)

Figure 5-12. Landscape at the Point Sturt (North) sampling location (Site 8).

Figure 5-13. Surface soil profiles at Site 8 (left photograph) and Site 9 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

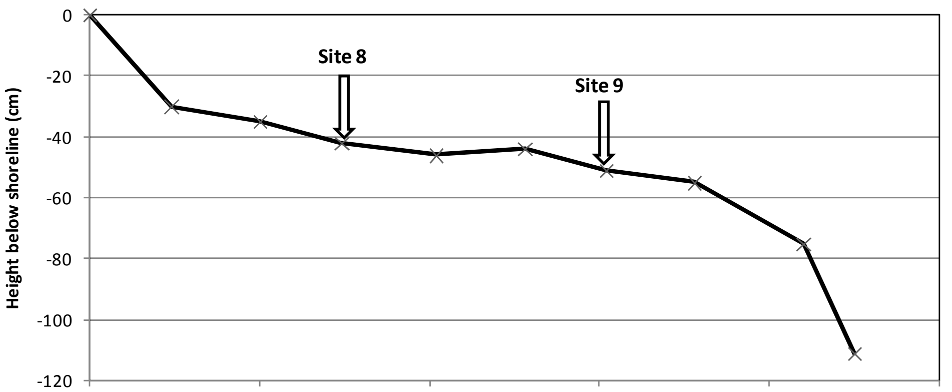

Figure 5-14. Shoreline cross-section at Site 8 and 9.

5.1.6 Milang, Lake Alexandrina site characteristics (Site 10 and 11)

Figure 5-15. Landscape at the Milang sampling location (Site 11).

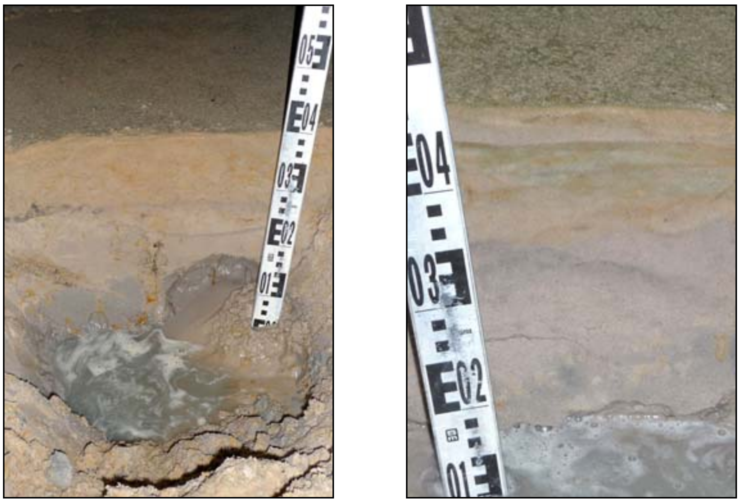

Figure 5-16. Surface soil profiles at Site 10 (left photograph) and Site 11 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

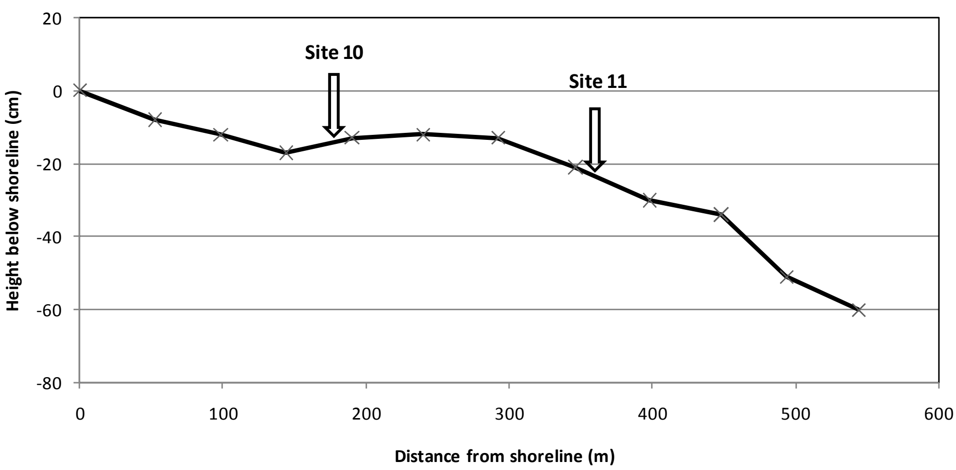

Figure 5-17. Shoreline cross-section at Site 10 and 11.

5.1.7 Ewe Island Barrage site characteristics (Site 12)

Figure 5-18. Landscape and soil profile at Ewe Island Barrage (Site 12). A profile description at this site is presented in Appendix 1.

5.1.8 Currency Creek site characteristics (Site 13)


Figure 5-19. Landscape (including a close up view of the algae) and jarosite at 15 cm in the soil profile at Currency Creek (Site 13). A profile description at this site is presented in Appendix 1.

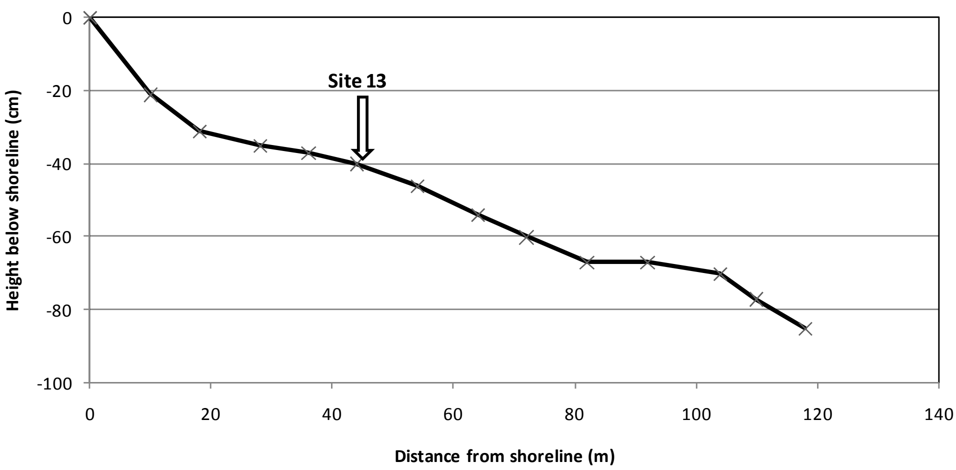

Figure 5-20. Shoreline cross-section at Site 13.

5.1.9 Poltalloch Station, Lake Alexandrina site characteristics (Site 14 and 15)

Figure 5-21. Landscape at the Poltalloch Station sampling location (Site 15).

Figure 5-22. Surface soil profiles at Site 14 (left photograph) and Site 15 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

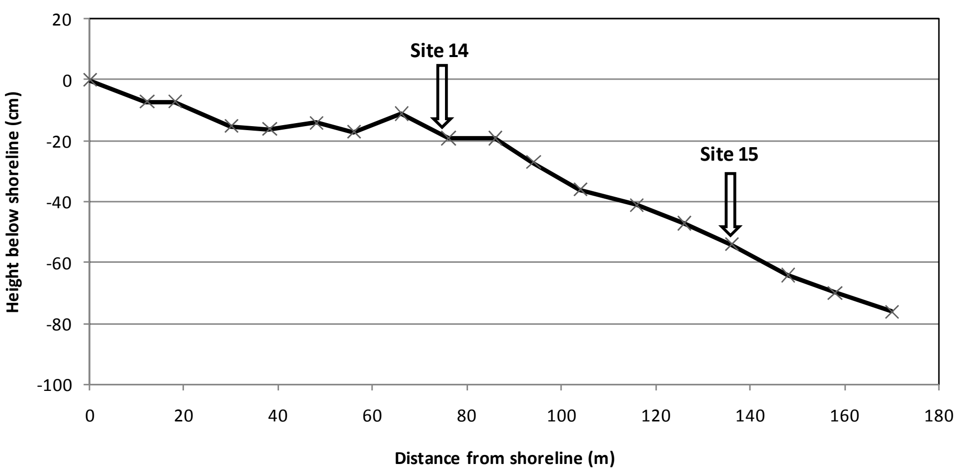

Figure 5-23. Shoreline cross-section at Site 14 and 15.

5.2 Characterisation of the River Murray water and seawater quality

The water quality characteristics of the River Murray water and seawater prior to inundation is given in Table 5-1.

Table 5-1. Summary of column surface water hydrochemical characteristics prior to inundation. Standard deviation of replicate samples are given in brackets.

Parameter	Units	River Murray	Seawater
pH		7.13 (± 0.14)	7.76 (± 0.09)
Redox Potential (Eh)	mV	294 (± 16)	354 (± 32)
Electrical Conductivity (EC)	mS/cm	0.77 (n.a.)	53.13 (n.a.)
Dissolved Oxygen (DO)	mg/L	9.0 (± 0.1)	9.2 (± 0.1)
Alkalinity	mmol/L	1.6 (± <0.1)	3.9 (± <0.1)
Ferrous Iron (Fe^{2+})	ppm	<0.2	<0.2
Ferric Iron(Fe^{3+})	ppm	<0.2	<0.2
Dissolved Sulfide (S^{2-})	ppb	<30	<30
Dissolved Organic Carbon (DOC)	ppm	6.9 (n.a.)	2.9 (n.a.)
Nitrate (NO_3^-)	ppm N	0.185 (± 0.035)	0.025 (± 0.007)
Nitrite (NO_2^-)	ppm N	0.010 (± <0.001)	<0.005
Ammonia (NH_3)	ppm N	0.075 (± 0.007)	0.090 (± <0.001)
Orthophosphate (PO_4^{3-})	ppm P	0.009 (± <0.001)	0.008 (± 0.007)
Chloride (Cl^-)	ppm	169 (± 14)	20,383 (± 887)
Sulfate (SO_4^{2-})	ppm	50 (± 11)	2,923 (± 113)
Sodium (Na^+)	ppm	113 (± 13)	10,462 (± 727)
Potassium (K^+)	ppm	4.3 (± 0.3)	409.1 (± 25.5)
Calcium (Ca^{2+})	ppm	19.9 (± 1.0)	432.5 (± 33.1)
Magnesium (Mg^{2+})	ppm	15.0 (± 1.5)	1,267 (± 104)
Aluminium (Al)	ppm	0.01 (± < 0.01)	0.01 (± <0.01)
Iron (Fe)	ppm	0.02 (± 0.02)	0.03 (± 0.03)
Manganese (Mn)	ppm	<0.01	<0.01
Arsenic (As)	ppb	<1.0	<15.0
Copper (Cu)	ppb	2.1 (± 0.66)	2.2 (± 1.32)
Nickel (Ni)	ppb	1.5 (± 0.39)	<5.0
Zinc (Zn)	ppb	<1.0	<5.0
Cadmium (Cd)	ppb	<0.1	0.11 (± 0.15)
Cobalt (Co)	ppb	<1.0	<1.0
Chromium (Cr)	ppb	2.4 (± 0.48)	<4.4
Lead (Pb)	ppb	<1.0	<1.0

5.3 Inundation of soil materials with River Murray water and seawater

The results from the River Murray water and seawater inundation experiments with 15 representative soil materials from the Lower Lakes are given in Appendices 3 - 7. Each soil material will be addressed separately, and this section is followed by a discussion of the results.

5.3.1 Inundation of the Waltowa soil material (Site 1)

5.3.1.1 Sediment characteristics

The sediment characteristics of the Waltowa soil material (Site 1) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-17 – 9-36).

5.3.1.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Waltowa soil material (Site 1) with both River Murray water and seawater are given in Appendix 4 (Tables 9-317 – 9-346).

5.3.1.3 Discussion of results of inundation

5.3.1.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-17 to 9-36)) show the following main findings:

- The uppermost 15 cm of this soil material consisted of an orange sandy layer 0-5 cm thick with a pH of 7.8, underlain by a grey sandy layer 7 cm thick with a pH of 4.9. The lowermost 3 cm of the sampled soil material at this site was a grey sandy clay material with a pH of 6.3.

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 35 days of inundation with either seawater or River Murray water. However after 136 days of inundation sulfides in the di-sulfide, acid volatile, elemental sulfur forms had accumulated albeit at low levels.

- Titratable Actual Acidity (TAA) were negligible (i.e. < 3 mol H^+/tonne) as would be expected given the neutral pH of this soil material.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality - the main apparent changes to the solid phase observed during the 136 day inundation were:

    - Increases HCl-extractable Fe in the surface layer along with decreases in HCl-extractable Fe in the lower layers.

5.3.1.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-317 to 9-346) show the following main findings:

- The inundation of this neutral soil material by seawater or River Murray water tended to increase the pH of the inundating waters over the duration of the 35 day inundation period (Figure 5-24).

- Reducing conditions rapidly developed in the underlying sediments inundated by both waters. The Eh decreased to a much lesser extent in the inundating waters.
- Alkalinity in the pore-waters increased during the inundation (Figure 5-25). This alkalinity was presumably the result of organic matter decomposition, and increased the alkalinity of the inundating waters over the duration of the 35 day inundation period most likely by upwards diffusion.

- Iron mobilisation was strong in the pore-waters but was not observable in the inundating waters (presumably due to oxidation and precipitation of any upwards diffusing Fe(II) in those overlying waters) (Figure 5-26).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the surface waters tested. However, sulfide was detected at concentrations of up to 69 ppb in the pore-waters of the sediments inundated with River Murray water (see Table 9-777, Appendix 6)

- NO_3^- concentrations increased markedly - and to similar concentrations - in the both of the overlying waters during the inundation period (Figure 5-27). For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value.

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 18 days for the Seawater inundating waters, respectively) but only exceeded the seawater ANZECC trigger value (Figure 5-28) in the overlying Seawater on days 18 and 25. This effect was much greater during inundation with seawater. The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- PO_4 concentrations increased markedly in the inundation waters. This effect was greater during inundation with River Murray water. The concentrations of PO_4 in the pore-waters suggest that the increase of PO_4 in the inundating waters was via upwards diffusion.

- The concentrations of many metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-29 – 5-32).

- The concentration of As in the inundation waters increased during inundation but not to levels exceeding the appropriate ANZECC trigger values (Figure 5-32).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-33).

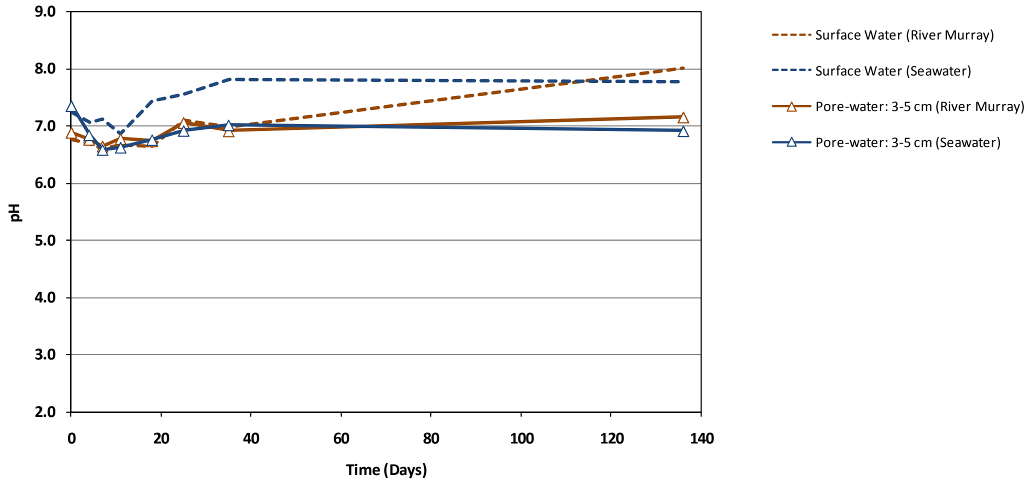

Figure 5-24. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

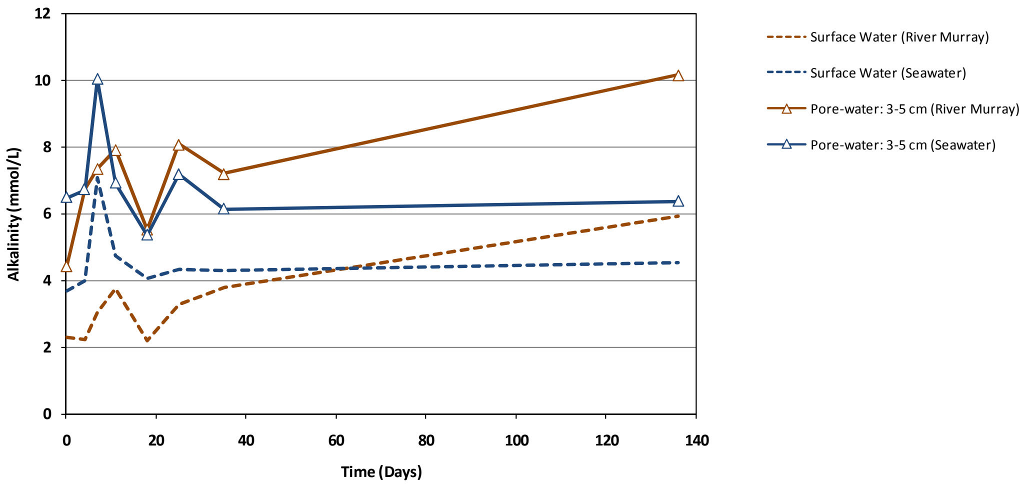

Figure 5-25. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

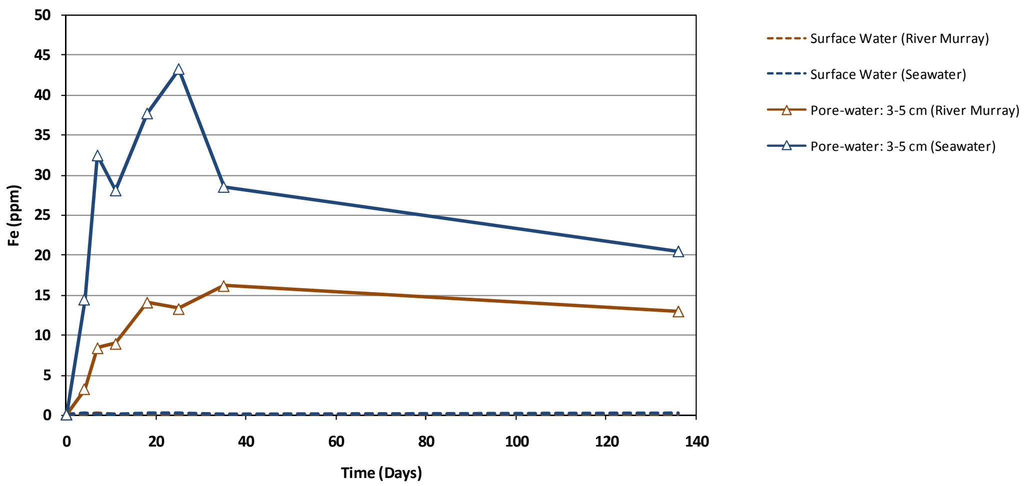

Figure 5-26. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

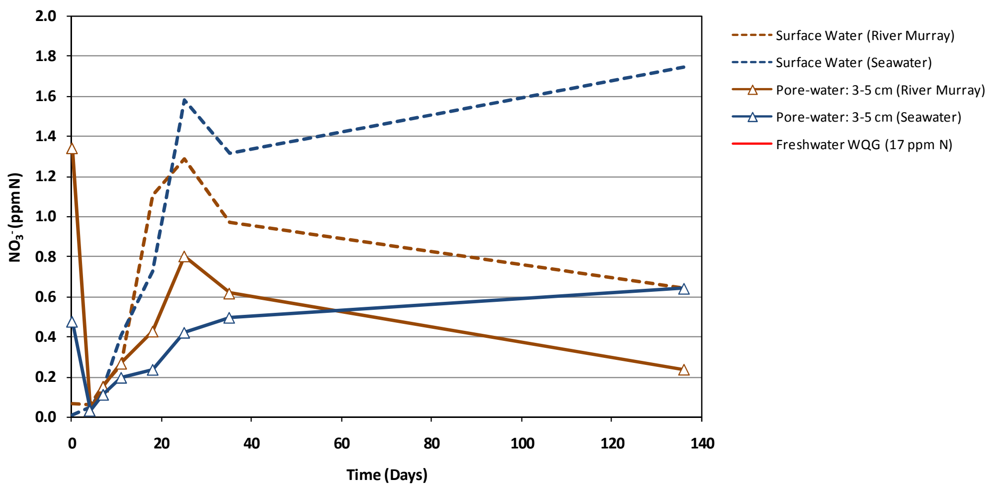

Figure 5-27. Nitrate (NO_3^-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. all values below the freshwater WQG trigger value).

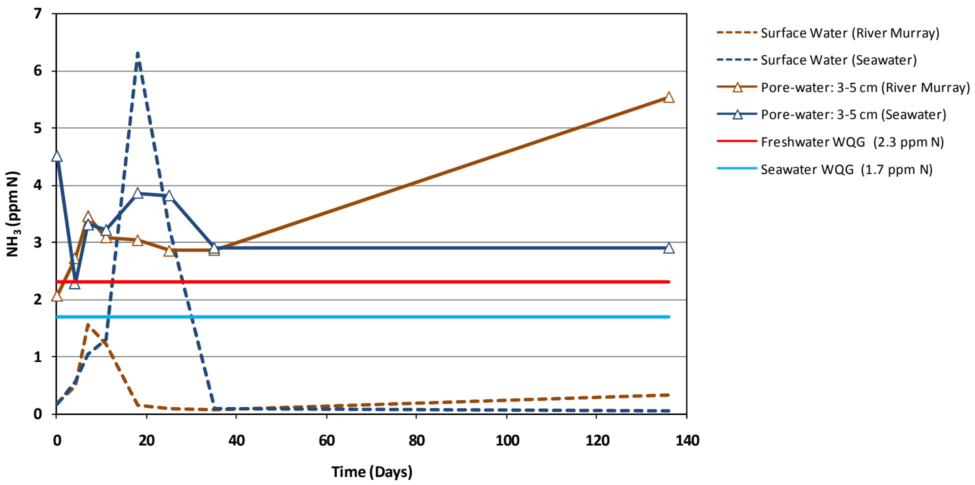

Figure 5-28. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

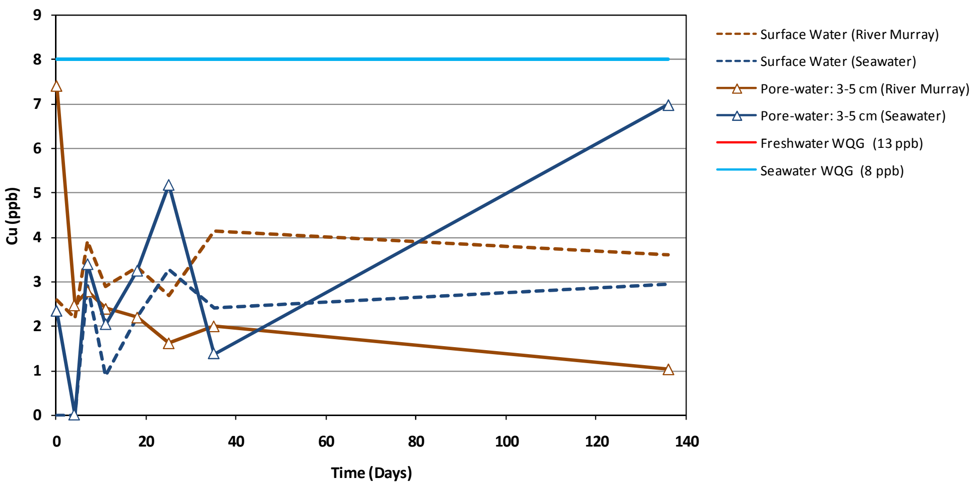

Figure 5-29. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

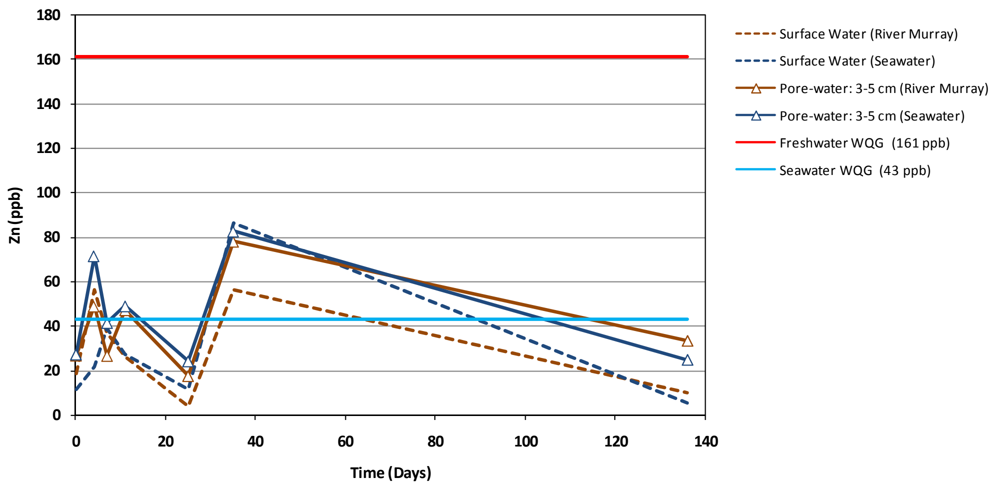

Figure 5-30. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

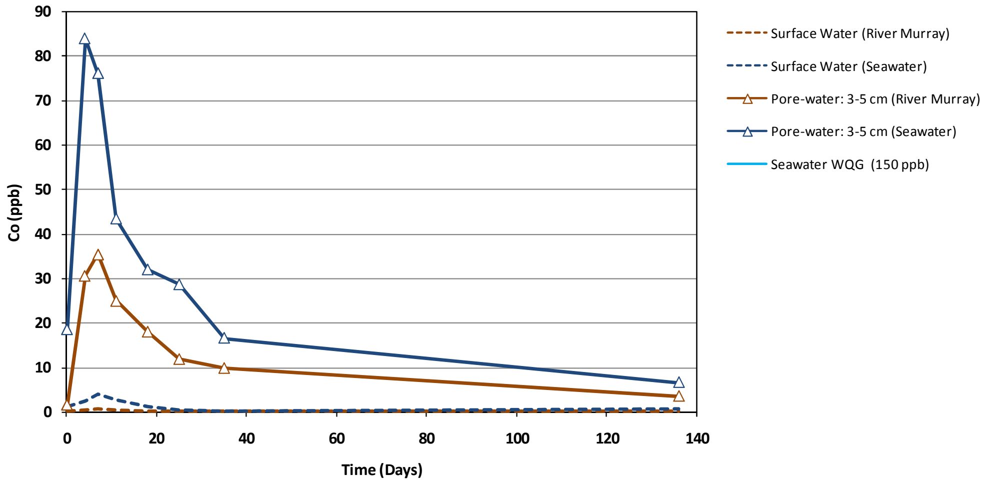

Figure 5-31. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

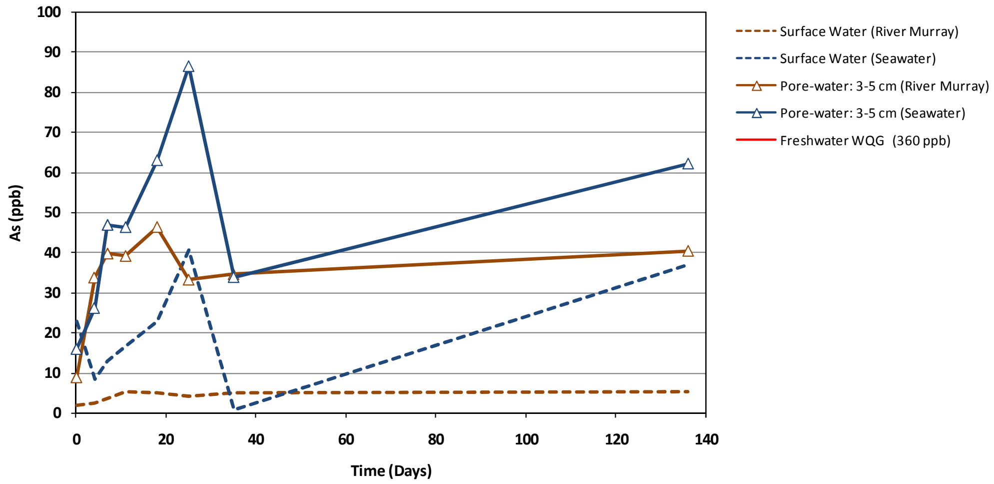

Figure 5-32. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

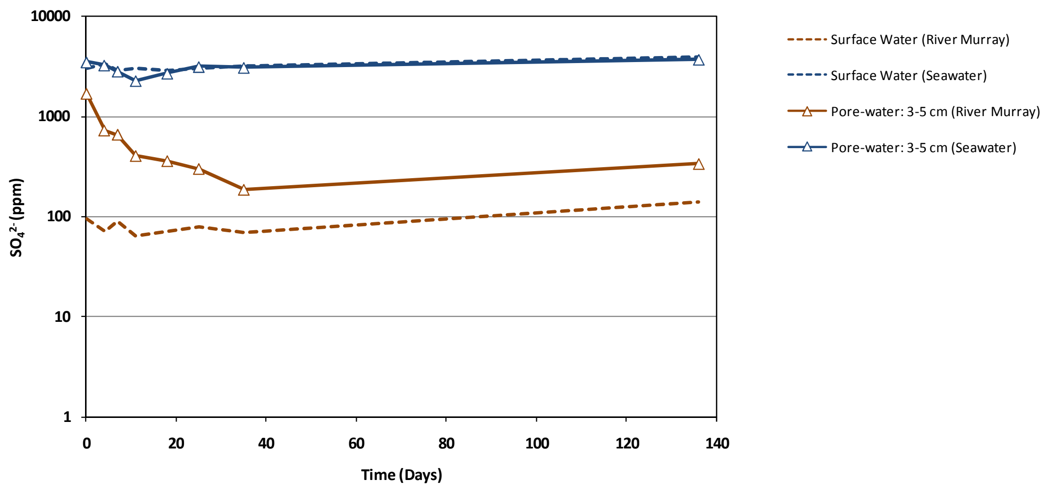

Figure 5-33. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

5.3.1.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale, by comparison with the appropriate Water Quality Guidelines, are elevated concentrations of NH_3 and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Ni, and Mn - in addition to NH_3 and Zn - to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still dynamic up to the 136 days of inundation examined in this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as investigated in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.1.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The uppermost pore-waters in these sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) made only minor impacts on the pH and alkalinity of the overlying waters and on the mobilisation of potential contaminants into the inundating waters during the experimental timescale. The pHs of the inundating seawater were generally ~ 0.6 pH units higher than that of the inundating River Murray water and the inundating seawater also had a higher alkalinity. Although the rates of mobilisation of NH_3, Mn, As, Ni, Co into the inundating seawater were higher than those to the inundating River Murray water, the reverse was the case for PO_4.

5.3.2 Inundation of the Waltowa soil material (Site 2)

5.3.2.1 Sediment characteristics

The sediment characteristics of the Waltowa soil material (Site 2) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-37 – 9-56).

5.3.2.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Waltowa soil material (Site 2) with both River Murray water and seawater are given in Appendix 4 (Tables 9-347 – 9-376).

5.3.2.3 Discussion of results of inundation

5.3.2.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-37 – 9-56)) show the following main findings:

- The uppermost 15 cm of this soil material consisted of a beige sandy layer 0-5 cm thick with a pH of 8.8, underlain by an orange-mottled beige sandy layer 5 cm thick with a pH of 8.2. The lowermost 5 cm of the sampled soil material at this site was a mottled orange & dark grey beige sandy material with a pH of 8.3.

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Sulfides were present in minor amounts in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.

- Titratable Actual Acidity (TAA) were negligible (i.e. < 1.5 mol H^+/tonne) as would be expected given the neutral/alkaline pH of this soil material.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.2.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-347 – 9-376) show the following main findings:

- The inundation of this neutral soil material by seawater or River Murray water did not appreciably affect the pH of the inundating waters over the duration of the 136 day inundation period (Figure 5-34).

- Reducing conditions rapidly developed in the underlying sediments inundated by both waters and this decreased the Eh in the inundating waters to a similar extent.

- Alkalinity in the pore-waters was generally higher than those of the inundating waters during the inundation. The alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the incubation (Figure 5-35).

- Iron mobilisation was very weak in the pore-waters and was not observable in the inundating waters (Figure 5-36).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-778, Appendix 6).

- NO_3^- concentrations increased considerably - and to similar concentrations - in the both of the overlying waters during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-37).

- PO_4 concentrations increased only slightly in the inundation waters. The concentrations of PO_4 in the pore-waters suggest that the increases in PO_4 in the inundating waters was via upwards diffusion of pore-waters.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-38 – 5-39).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-40).

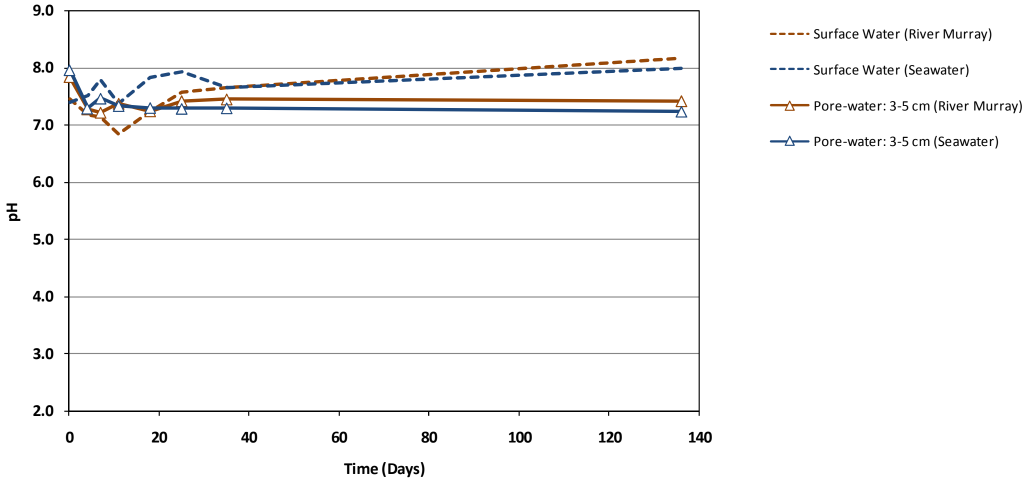

Figure 5-34. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

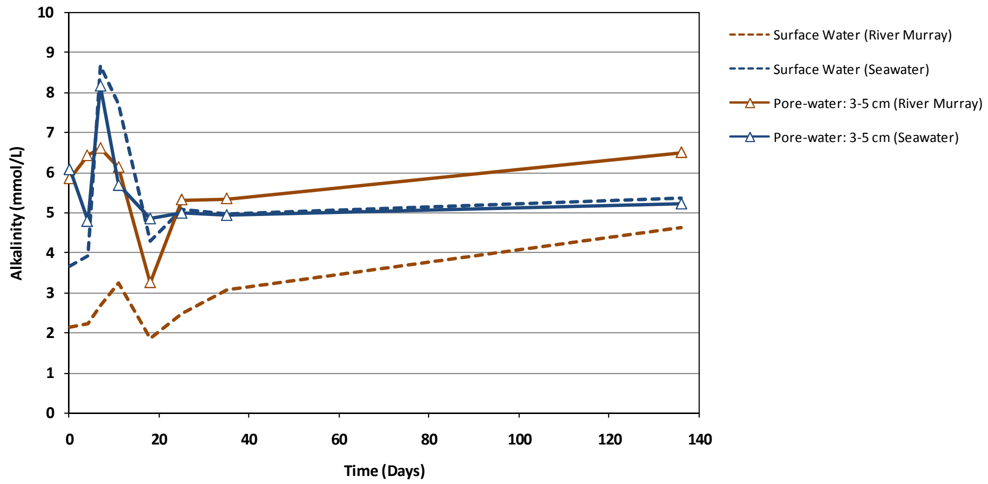

Figure 5-35. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

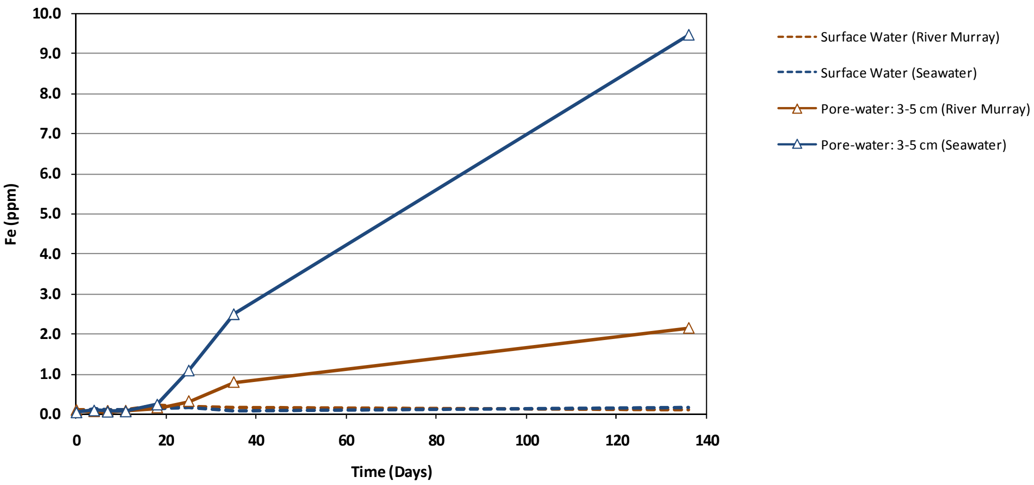

Figure 5-36. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

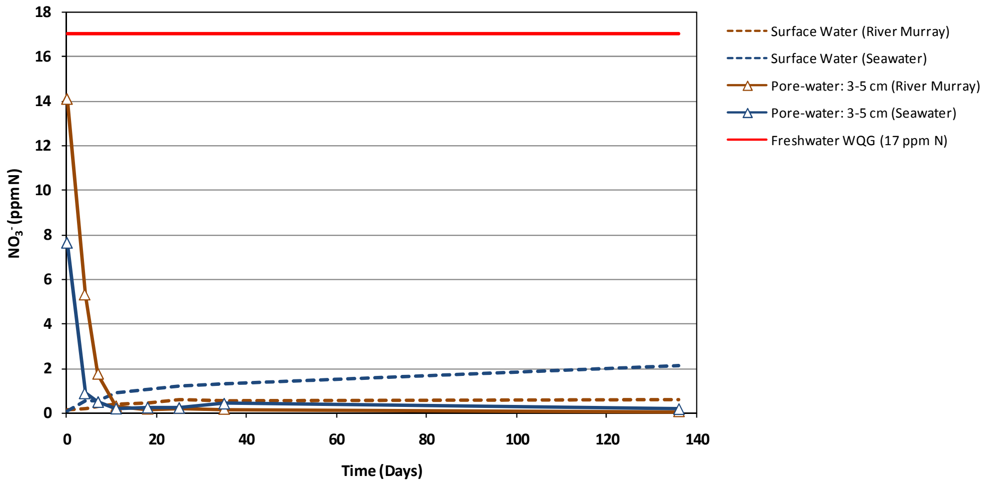

Figure 5-37. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

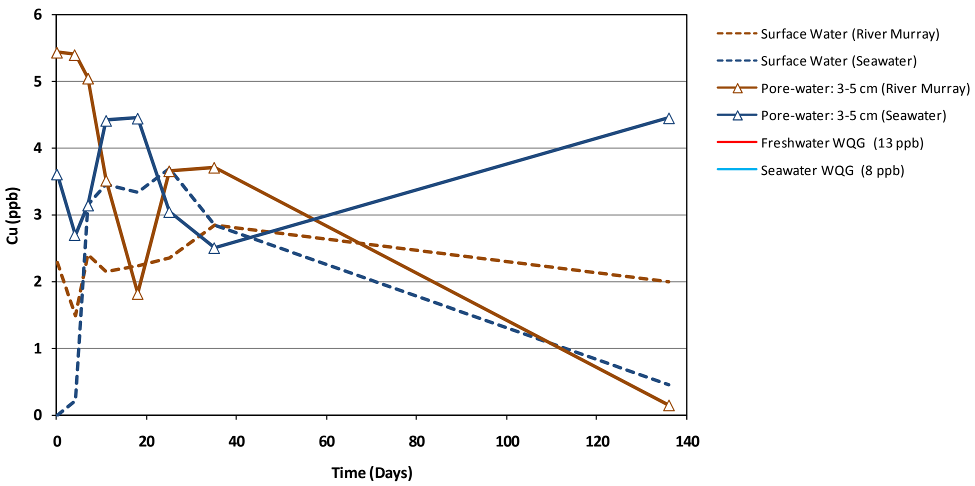

Figure 5-38. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

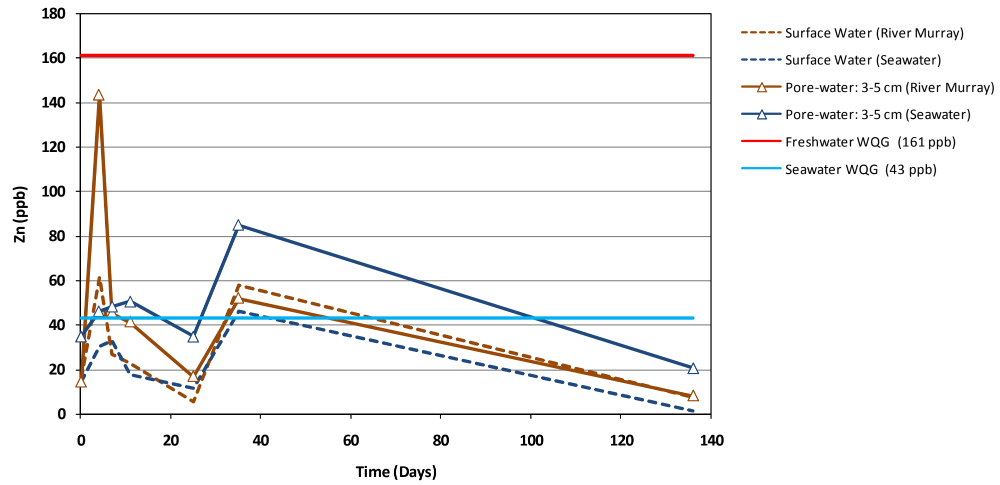

Figure 5-39. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2 (n.b. data below the laboratory LOD plotted).

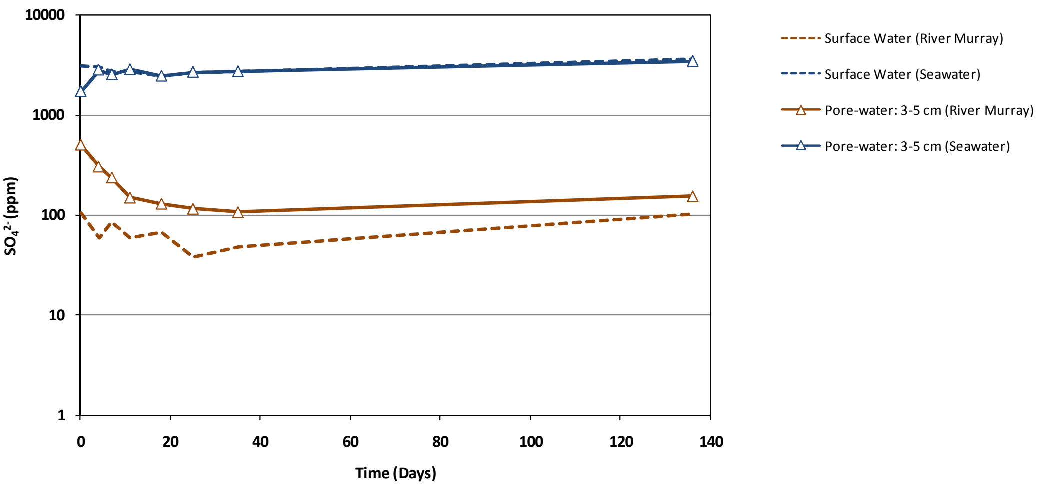

Figure 5-40. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

5.3.2.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters to levels over the appropriate ANZECC trigger values. However, the actual impact would depend on factors including the effective dilution of this contaminant in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentration of Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution of this element into the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as investigated in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.2.3.4 *Effect of inundating water type*

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) made only minor impacts on the pH and alkalinity of the overlying waters and on the mobilisation of potential contaminants into the inundating waters during the experimental timescale.

5.3.3 Inundation of the Meningie soil material (Site 3)

5.3.3.1 Sediment characteristics

The sediment characteristics of the Meningie soil material (Site 3) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-57 – 9-76).

5.3.3.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Meningie soil material (Site 3) with both River Murray water and seawater are given in Appendix 4 (Tables 9-377 – 9-406).

5.3.3.3 Discussion of results of inundation

5.3.3.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-57 – 9-76)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a sandy crust 0-1 cm thick with a pH of 7.5, underlain by a sandy layer 14 cm thick with a pH of 7.7 and consisting of alternating grey and white layers each approximately 3 cm thick.
- Sulfides were present in minor amounts in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. 0 mol H^+/tonne) as would be expected given the alkaline pH of this soil material.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – no major apparent changes to the solid phase were observed over the inundation.

5.3.3.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-377 – 9-406) show the following main findings:

- The inundation of this neutral soil material by seawater or River Murray water did not appreciably affect the pH of the inundating waters over the duration of the 136 day inundation period (Figure 5-41).
- Reducing conditions rapidly developed in the underlying sediments inundated by both waters and this decreased the Eh in the inundating waters to a lesser extent.
- Alkalinity in the pore-waters was generally higher than those of the inundating waters during the inundation. The alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the incubation (Figure 5-42).
- Iron mobilisation was slight in the pore-waters and was not observed in the inundating waters (Figure 5-43).
- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-779, Appendix 6).
- NO_3^- concentrations increased considerably - and more so in the inundating River Murray water than in the inundating seawater - during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were under the ANZECC trigger value (Figure 5-44).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 25 days for the seawater, respectively) but to levels below the appropriate ANZECC trigger values (Figure 5-45). This effect was greater during inundation with seawater. The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-46 – 5-50).

- The concentration of As in the inundation waters increased slightly during inundation but not to levels exceeding the appropriate ANZECC trigger value (Figure 5-50).

- There were marked depletions of SO_4 in the uppermost pore-waters during inundation with River Murray water (Figure 5-51), but also an appreciable increase in SO_4 in the inundating waters.

- The water soluble chemistry of the pore-waters of the soil materials at this Meningie site – as for the other Meningie site – indicate that these soil materials were strongly affected by seawater prior to inundation.

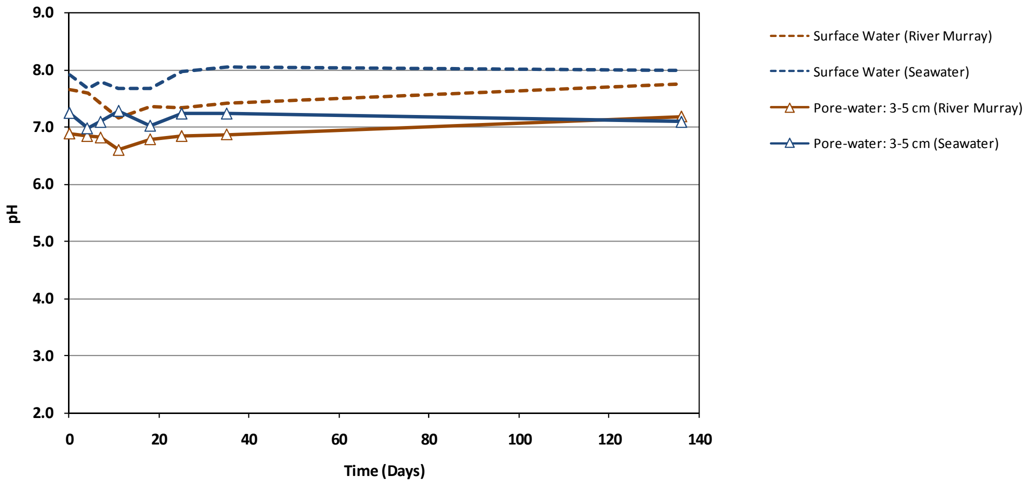

Figure 5-41. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

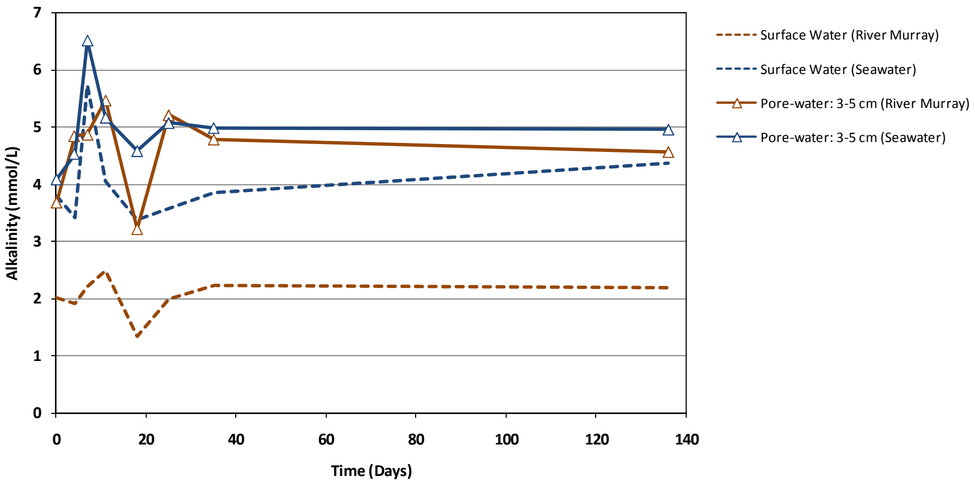

Figure 5-42. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

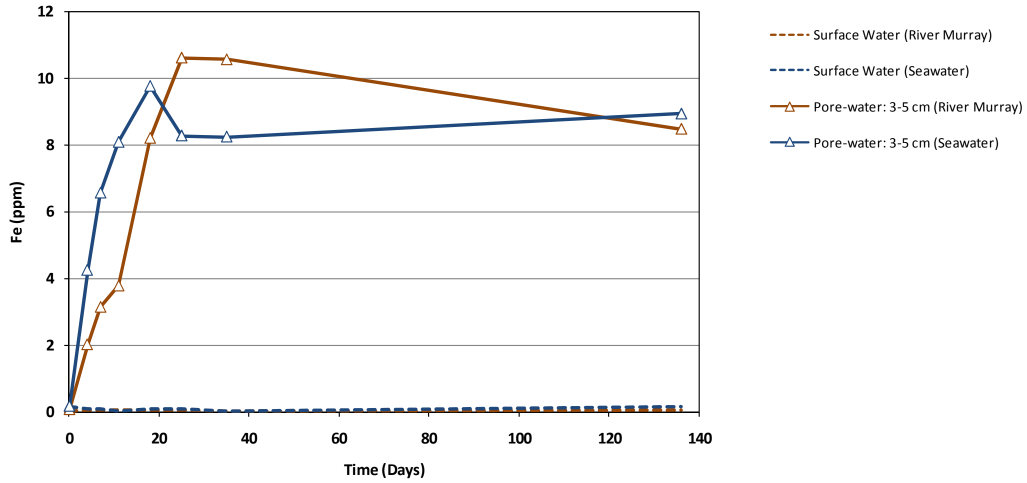

Figure 5-43. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

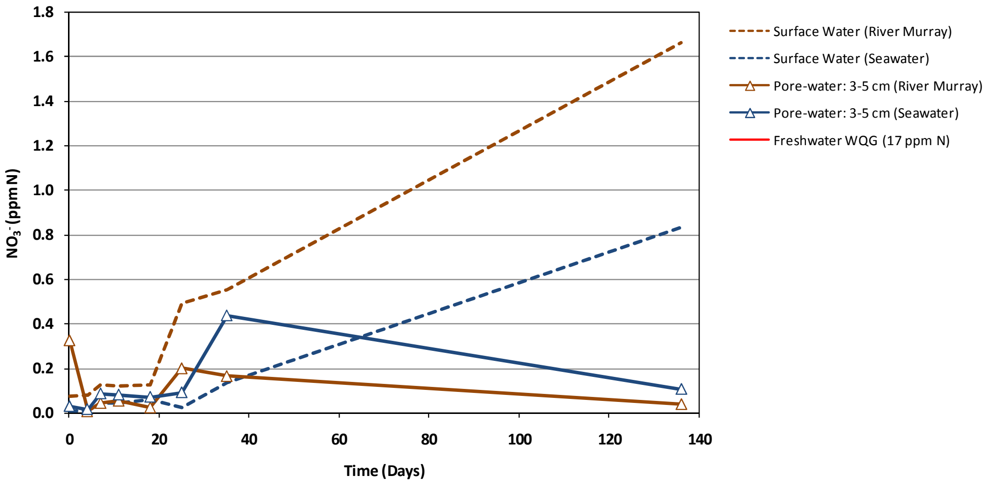

Figure 5-44. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. all values below the freshwater WQG trigger value).

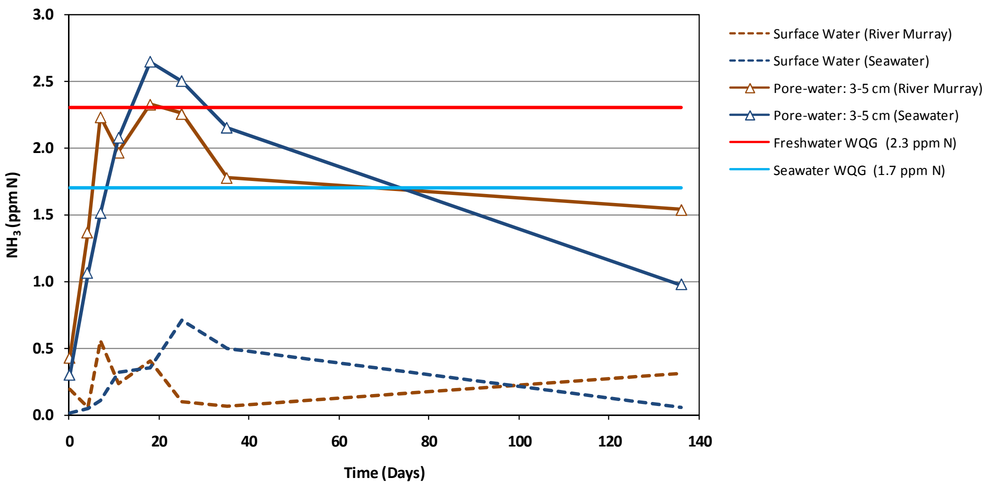

Figure 5-45. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3

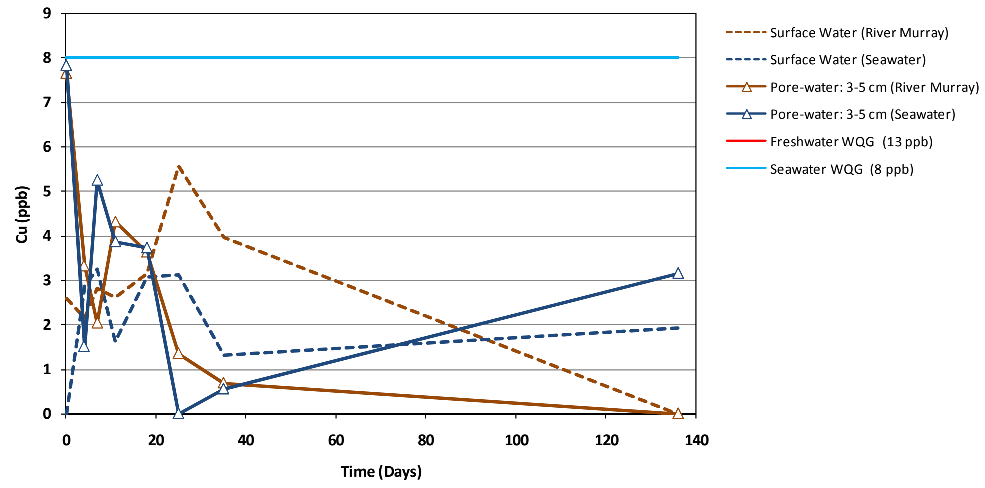

Figure 5-46. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

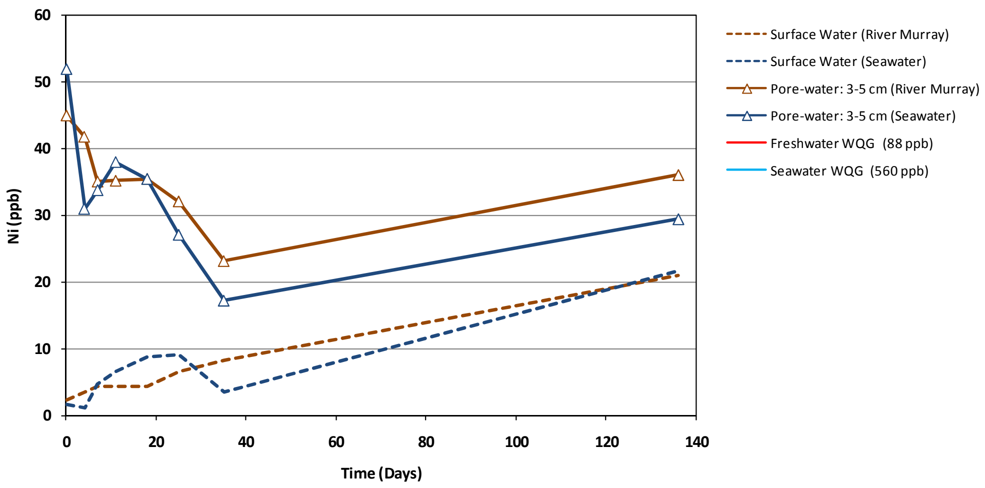

Figure 5-47. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

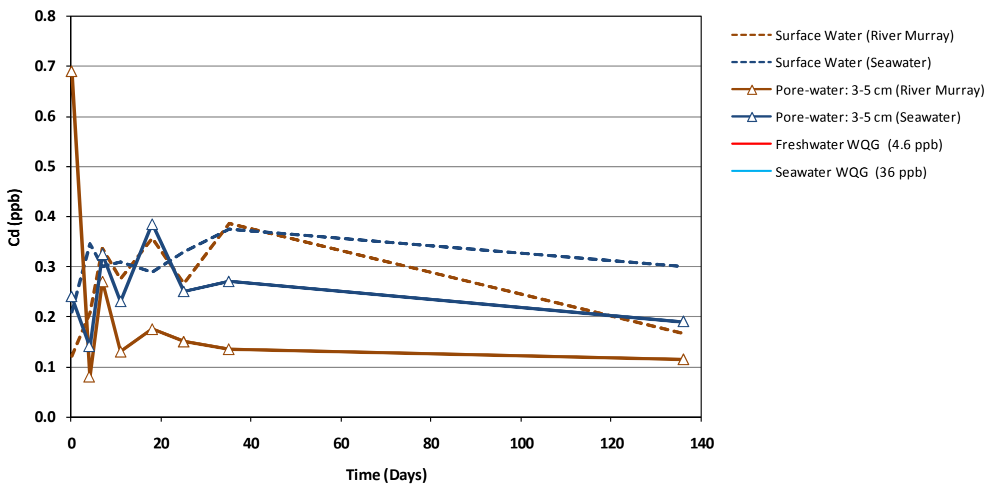

Figure 5-48. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

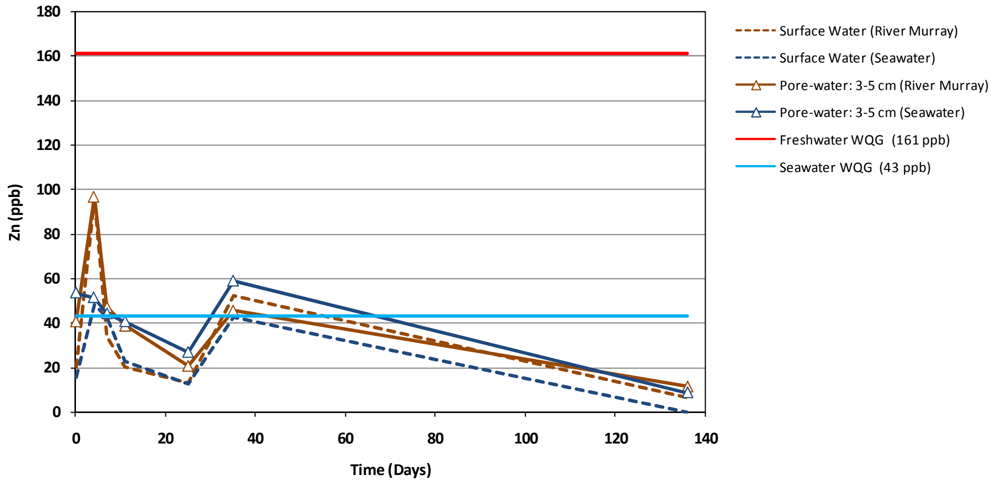

Figure 5-49. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted).

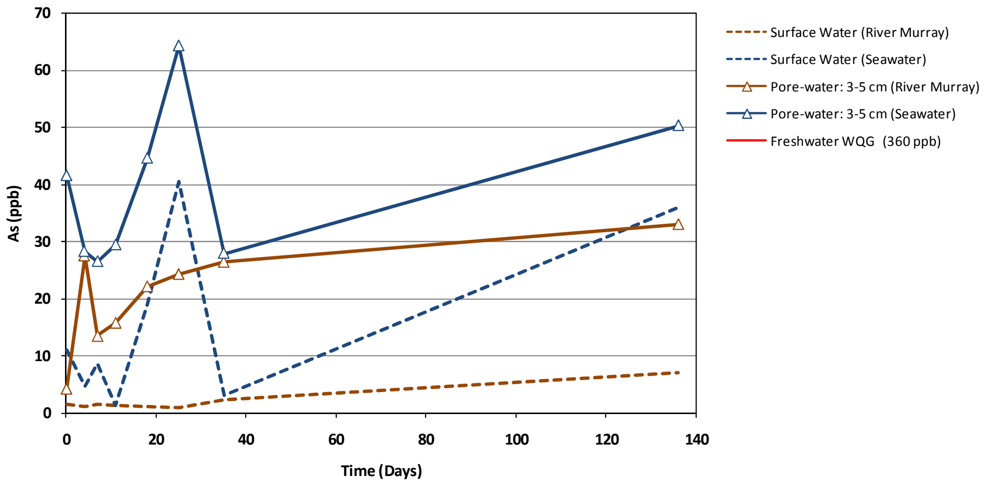

Figure 5-50. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

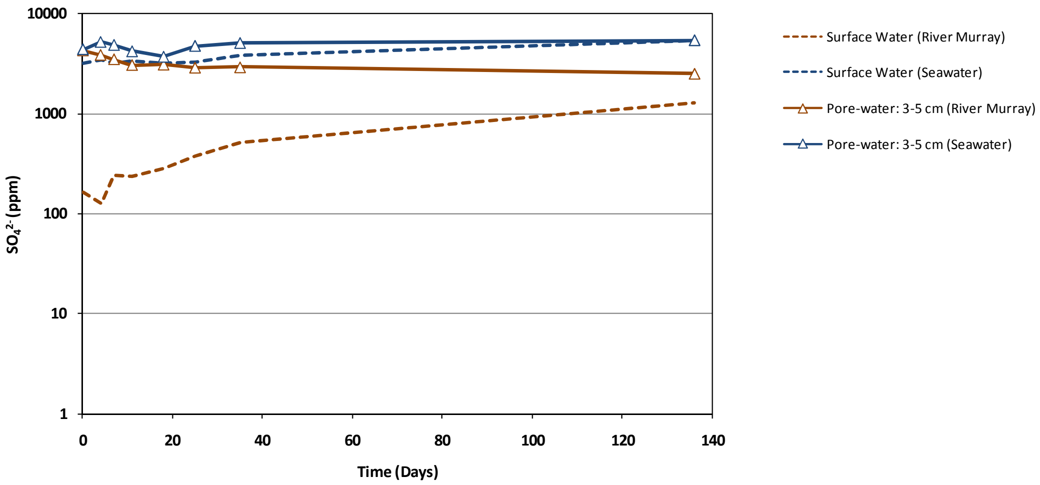

Figure 5-51. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

5.3.3.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Mn, NH_3, Cu and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as investigated in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.3.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater to the inundating waters. Interestingly for this sediment this salinity did not cause the salinities of the pore-waters underlying the seawater to increase considerably during inundation and they appeared to be influenced by seawater at the time of sampling.

Apart from the salinity effect in the inundating waters, the effect of the type of inundating water (i.e. River Murray water or seawater) made only minor impacts on the pH and alkalinity of the overlying waters and on the mobilisation of potential contaminants into the inundating waters during the experimental timescale.

5.3.4 Inundation of the Meningie soil material (Site 4)

5.3.4.1 Sediment characteristics

The sediment characteristics of the Meningie soil material (Site 4) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-77 – 9-96).

5.3.4.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Meningie soil material (Site 4) with both River Murray water and seawater are given in Appendix 4 (Tables 9-407 – 9-436).

5.3.4.3 Discussion of results of inundation

5.3.4.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-77 – 9-96) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a light beige sand layer (with some orange segregations) 0-11 cm thick with a pH of 7.6, with the remaining 4 cm consisting of beige sand with a pH of 6.7.
- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. < 2.0 mol H^+/tonne) as would be expected given the neutral/alkaline pH of this soil material.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.4.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-407 – 9-436) show the following main findings:

- The inundation of this neutral soil material by seawater or River Murray water did not appreciably affect the pH of the inundating waters over the duration of the 35 day inundation period (Figure 5-52).
- Reducing conditions rapidly developed in the underlying sediments inundated by both waters and this decreased the Eh in the inundating waters to a lesser extent.
- Alkalinity in the pore-waters was generally higher than those of the inundating waters during the inundation. The alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the incubation (Figure 5-53).
- Iron mobilisation increased during the inundation in the pore-waters and was not observable in the inundating waters (Figure 5-54).
- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-780, Appendix 6).
- NO_3^- concentrations increased considerably during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-55).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The NH_3 concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-56). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-57 – 5-58).

- There were marked depletions of SO_4 in the surface layer pore-waters during inundation with River Murray water (Figure 5-59).

- The water soluble chemistry of the pore-waters of the soil materials at this Meningie site – as for the other Meningie site – indicate that these soil materials were strongly affected by seawater prior to inundation.

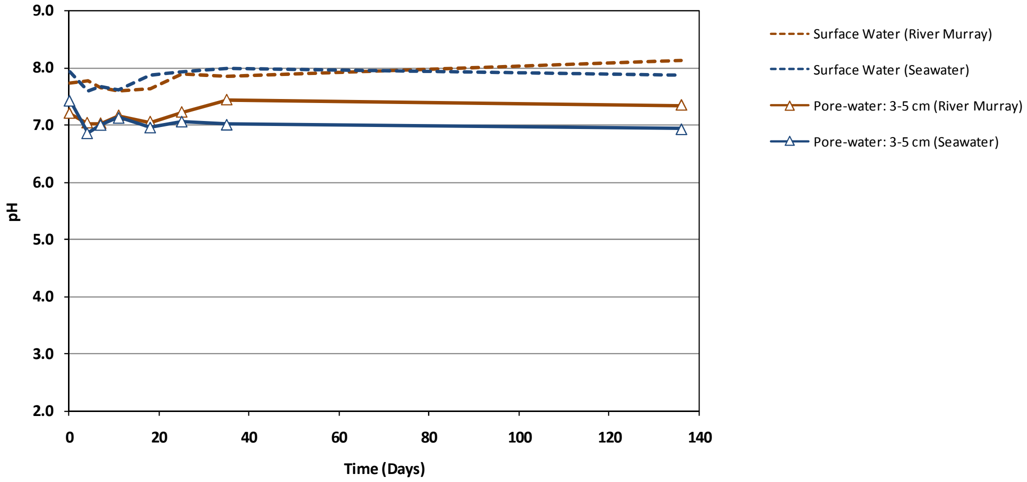

Figure 5-52. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

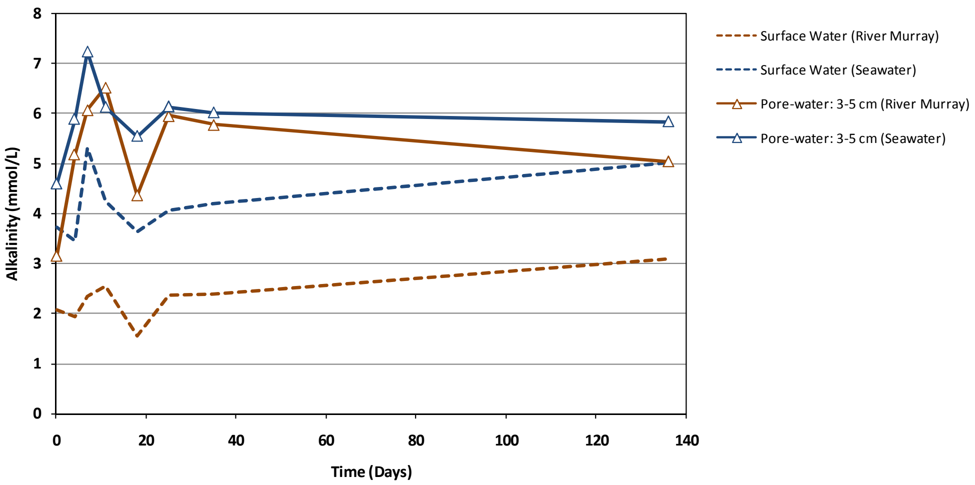

Figure 5-53. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

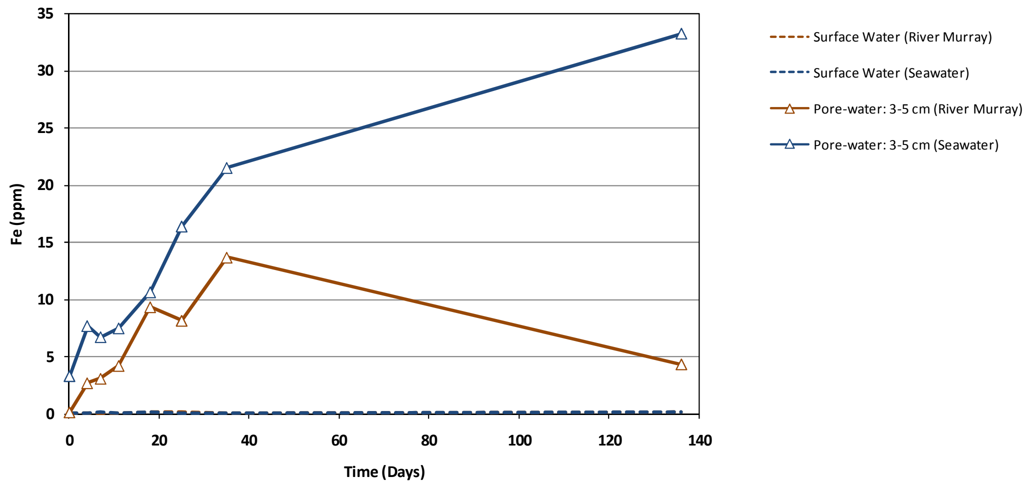

Figure 5-54. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

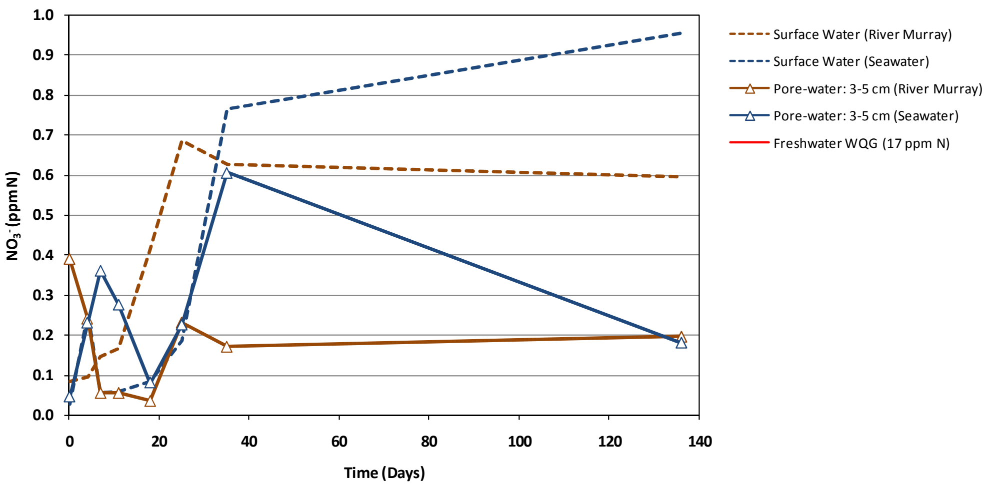

Figure 5-55. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. all values below the freshwater WQG trigger value).

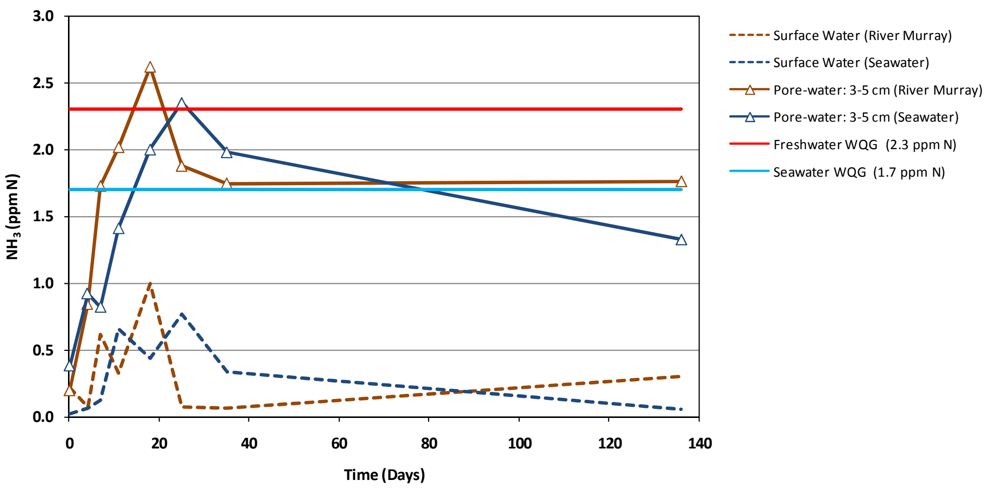

Figure 5-56. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

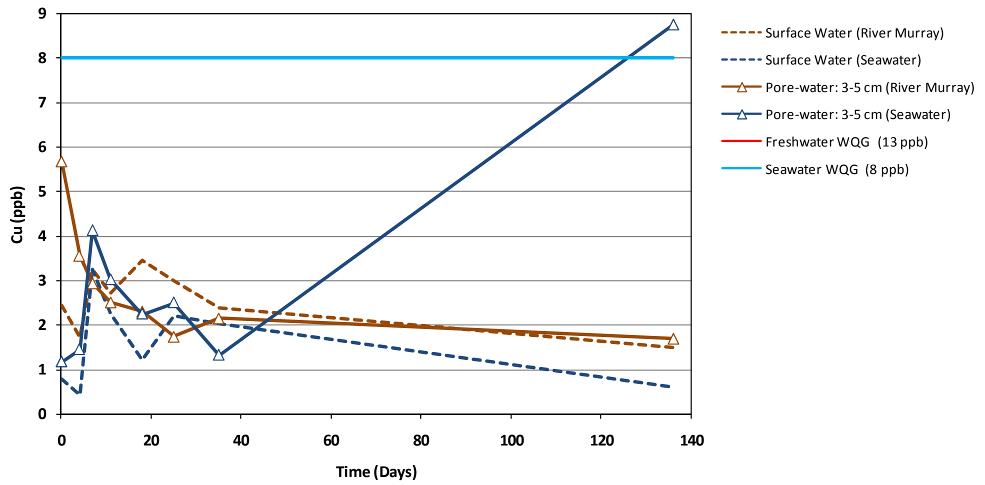

Figure 5-57. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

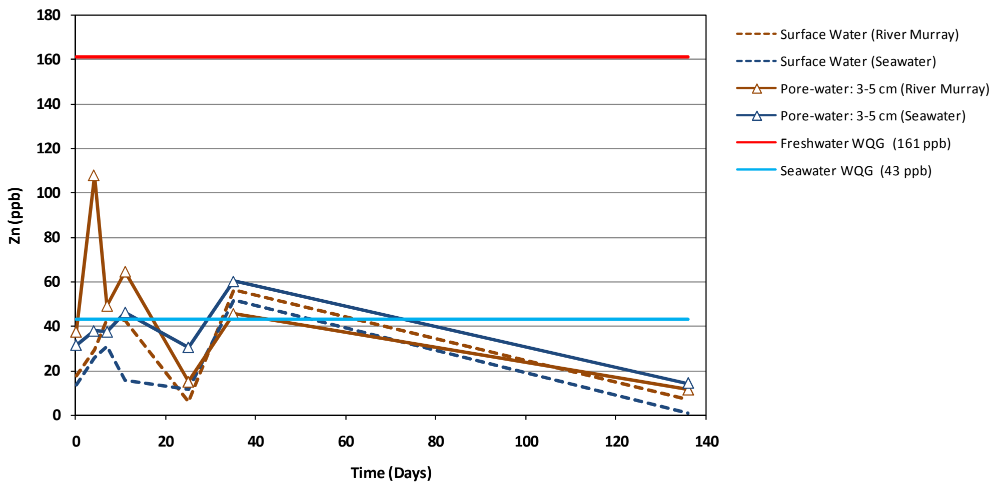

Figure 5-58. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. data below the laboratory LOD plotted).

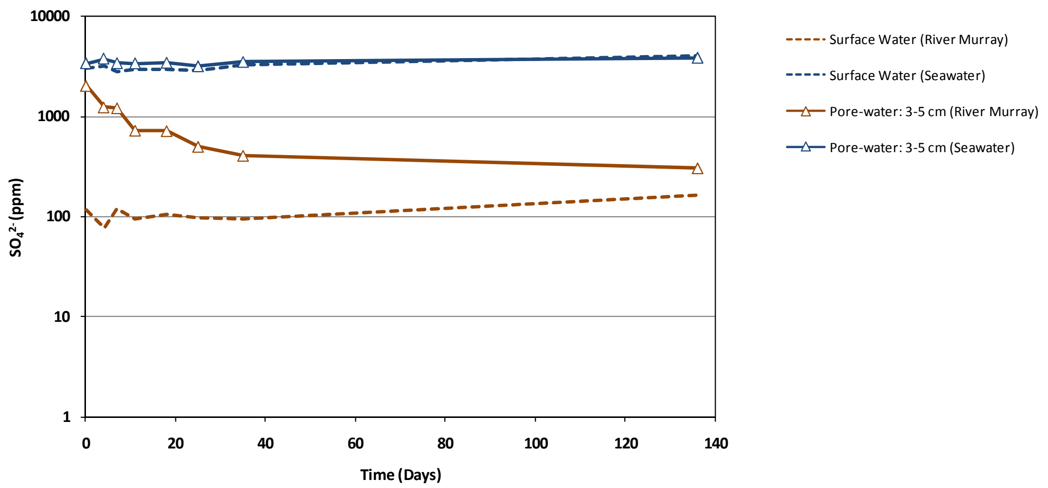

Figure 5-59. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

5.3.4.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Mn, NH_3, Cu, and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 35 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as investigated in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.4.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This salinity caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The uppermost pore-waters in these sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) made only minor impacts on acidification and the mobilisation of potential contaminants into the inundating waters during the experimental timescale.

5.3.5 Inundation of the Tolderol soil material (Site 5)

5.3.5.1 Sediment characteristics

The sediment characteristics of the Tolderol soil material (Site 5) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-97 – 9-116).

5.3.5.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Tolderol soil material (Site 5) with both River Murray water and seawater are given in Appendix 4 (Tables 9-437 – 9-466).

5.3.5.3 Discussion of results of inundation

5.3.5.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-97 – 9-116)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer (with abundant diffuse orange segregations) 0-5 cm thick with a pH of 5.6, with the remaining 10 cm consisting of a beige sand (with occasional orange segregations) with a pH of 5.6.
- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. < 2.2 mol H^+/tonne) as would be expected given the neutral/alkaline pH of this soil material.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.5.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-437 – 9-466) show the following main findings:

- The inundation of this neutral soil material by seawater or River Murray water did not appreciably affect the pH of the inundating waters over the duration of the 136 day inundation period (Figure 5-60).
- Reducing conditions rapidly developed in the underlying sediments inundated by both waters and this decreased the Eh in the inundating waters to a lesser extent.
- Alkalinity in the upper pore-waters was generally similar to those of the inundating waters during the inundation. The alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the incubation (Figure 5-61).
- Iron mobilisation was very slight during the inundation in the pore-waters and was not observable in the inundating waters (Figure 5-62).
- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-781, Appendix 6).
- NO_3^- concentrations increased considerably - and more so in the inundating seawater water than in the inundating River Murray - during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^-

concentrations were lower than the ANZECC trigger value, but appeared to be still increasing after the 35 days of inundation (Figure 5-63).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The NH_3 concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-64). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-65 – 5-69).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-70).

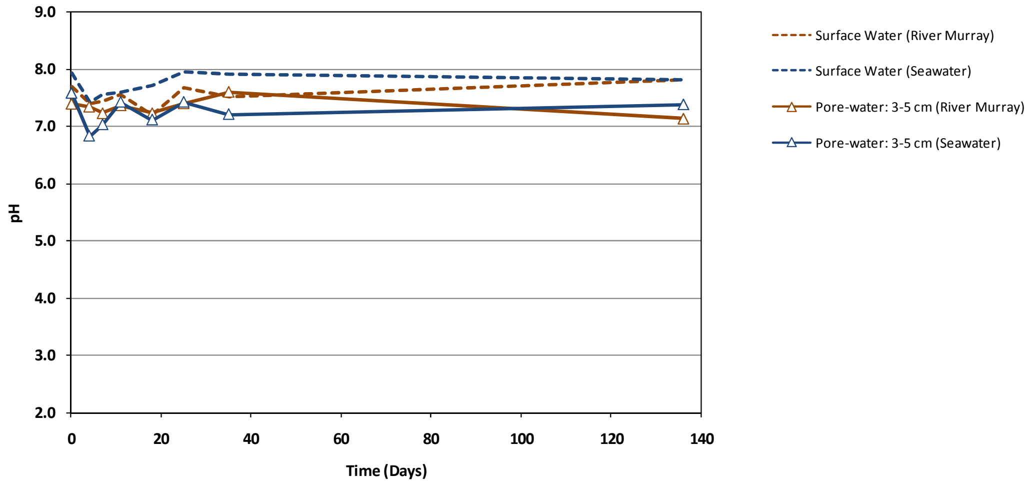

Figure 5-60. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

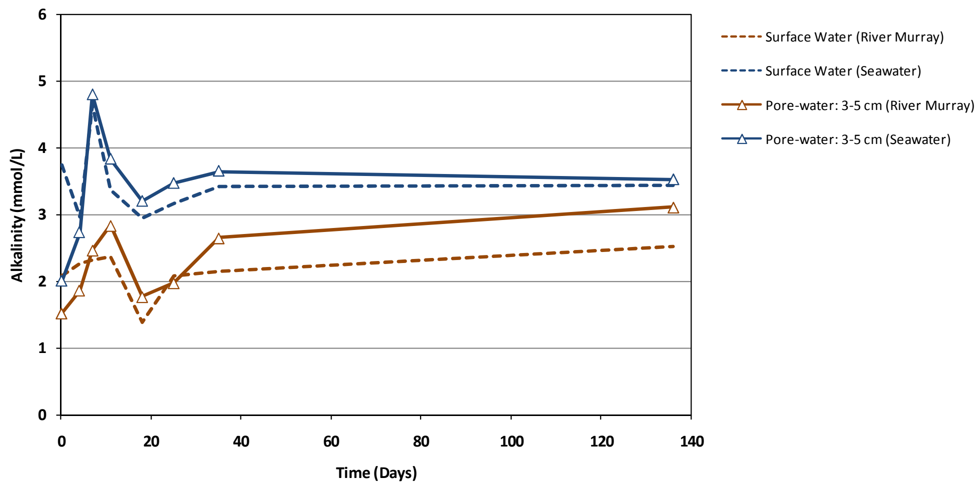

Figure 5-61. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

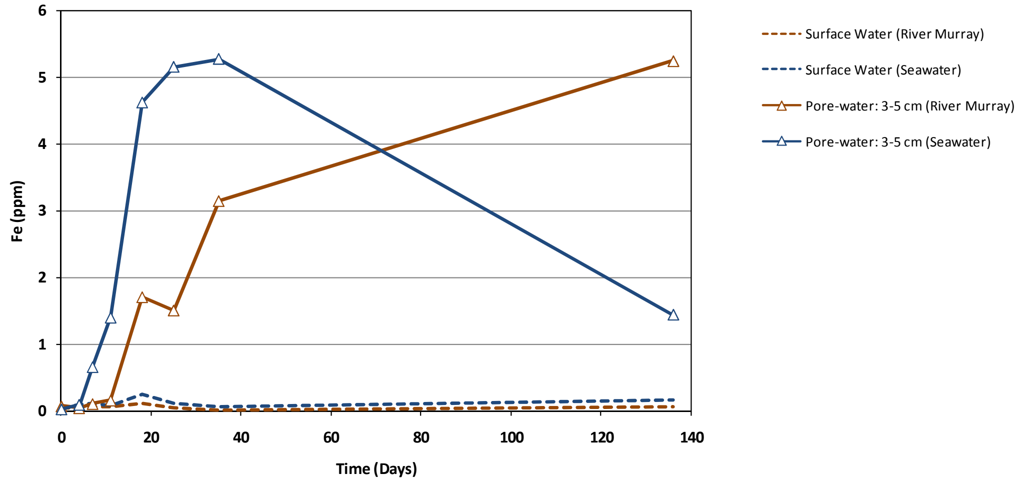

Figure 5-62. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

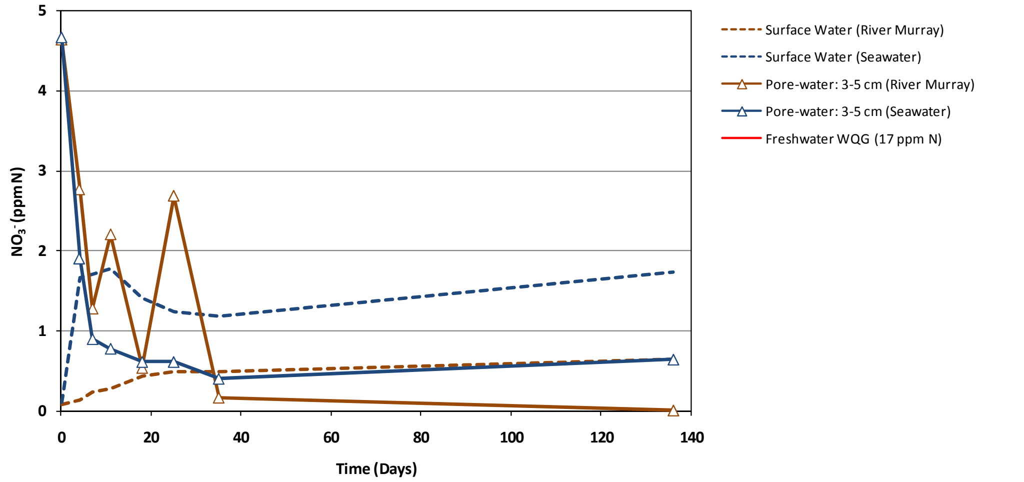

Figure 5-63. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. all values below the freshwater WQG trigger value).

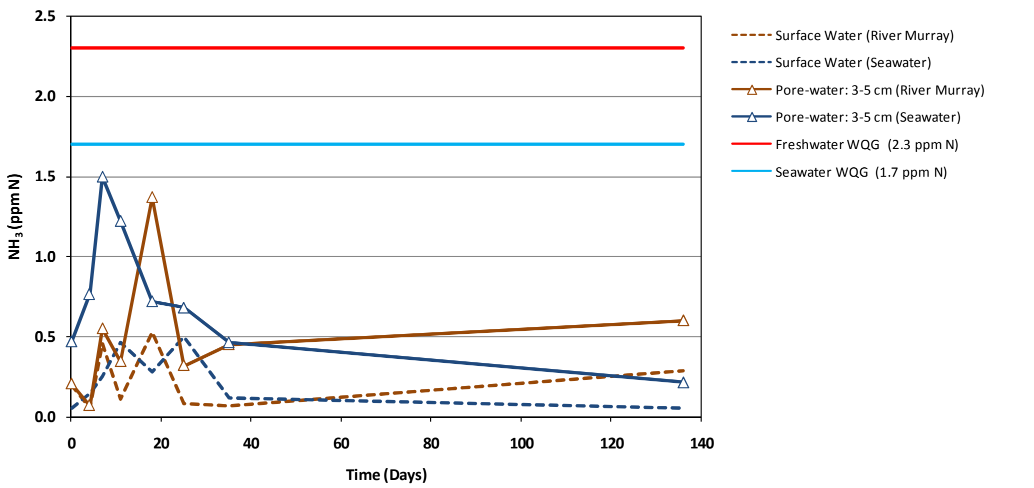

Figure 5-64. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

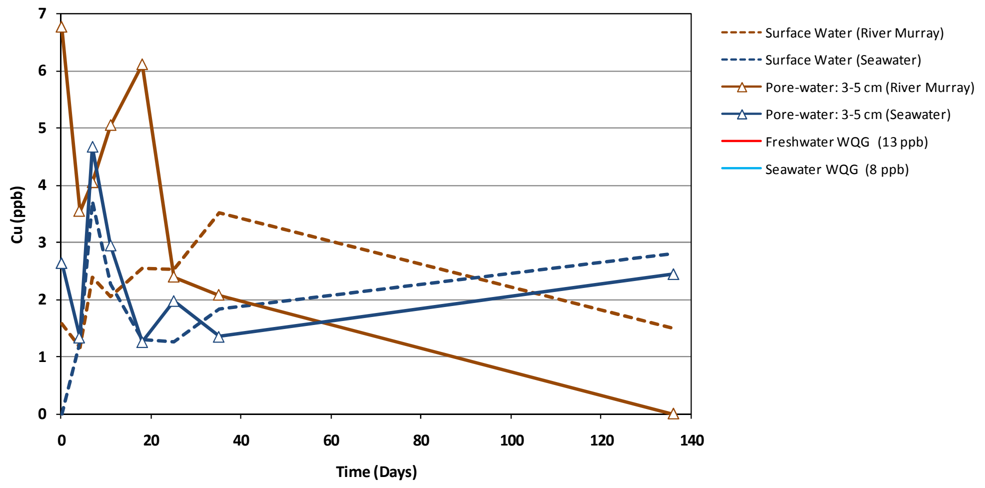

Figure 5-65. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

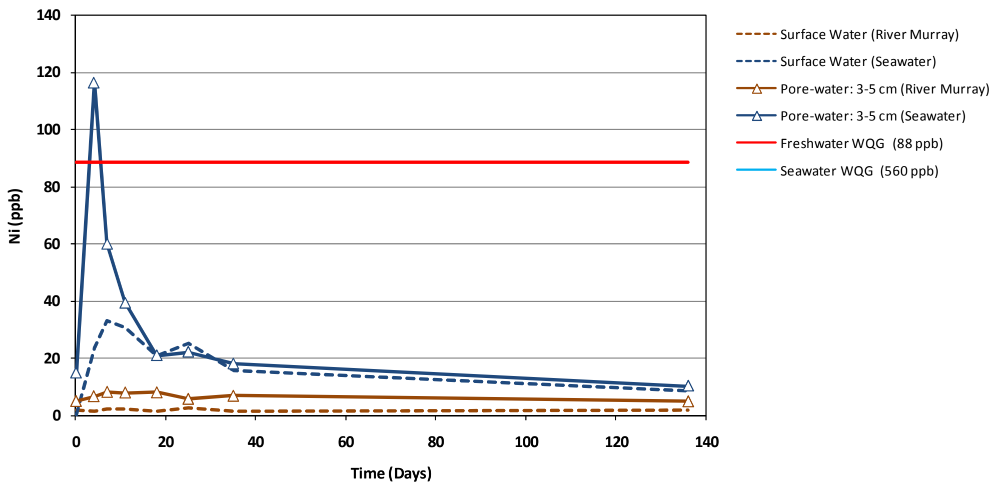

Figure 5-66. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

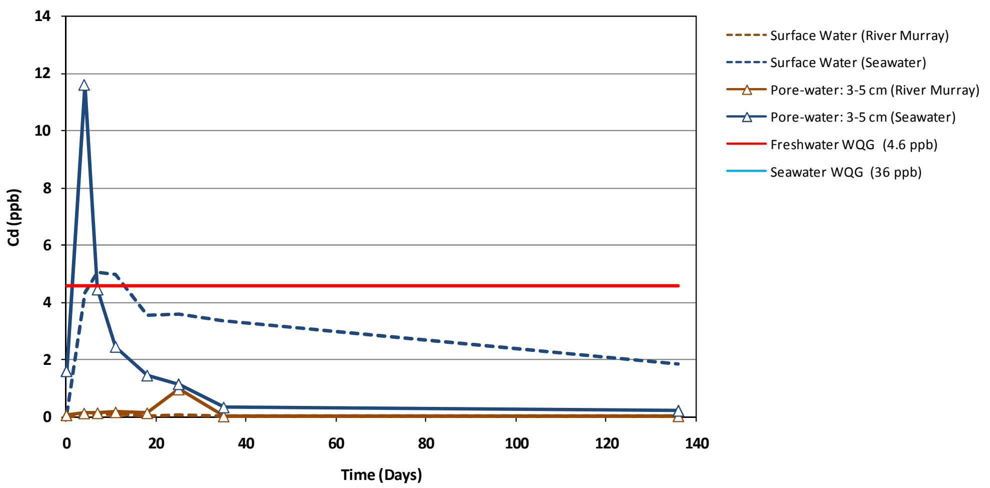

Figure 5-67. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

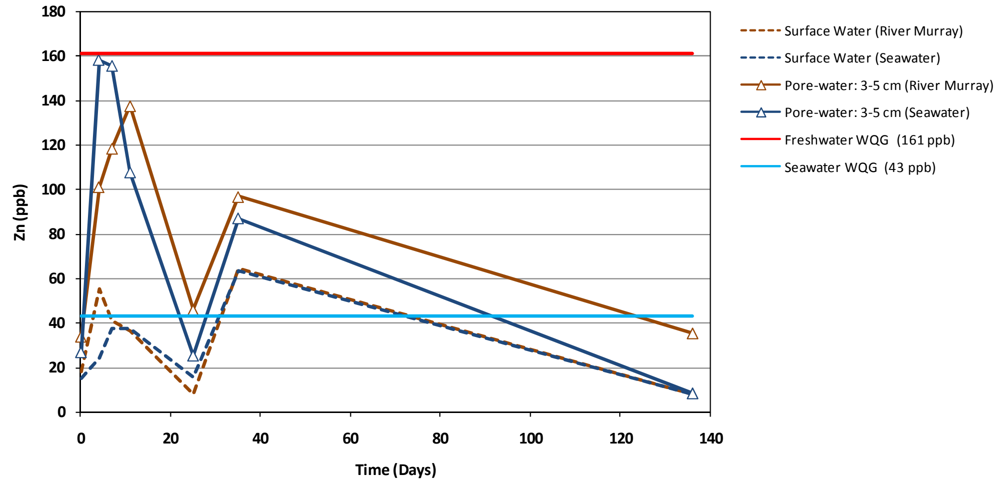

Figure 5-68. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

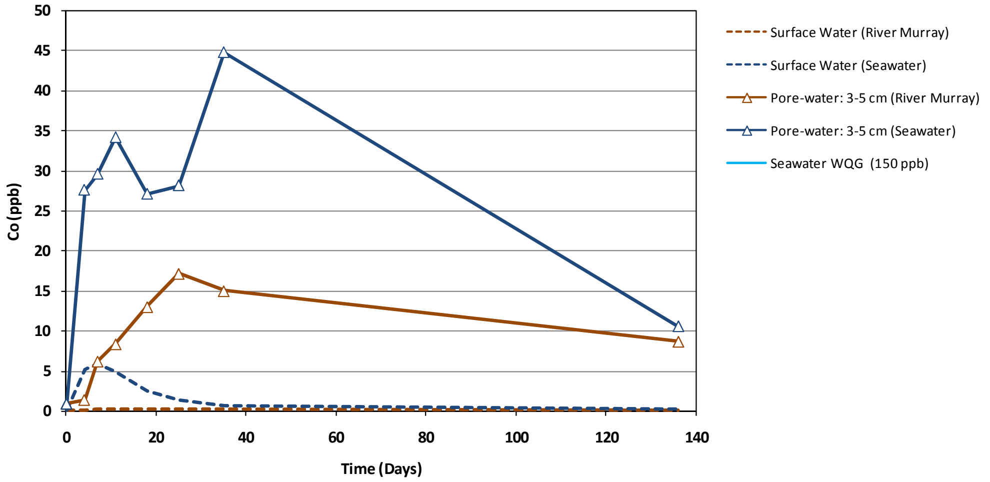

Figure 5-69. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

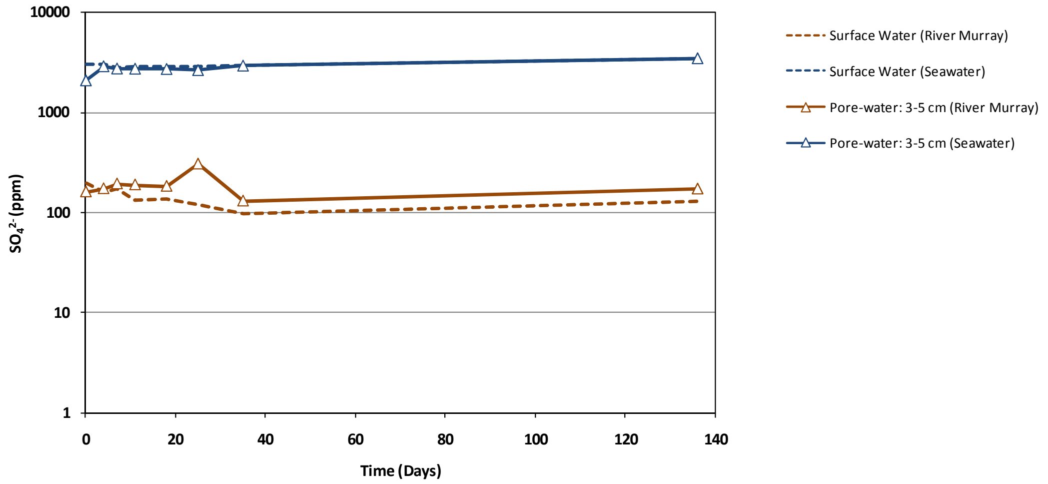

Figure 5-70. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

5.3.5.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Ni, Cd and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations (such as those described here) of the response to inundation of these materials to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.5.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments were becoming relatively depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) made only minor impacts on acidification and the mobilisation of potential contaminants into the inundating waters during the experimental timescale. The exceptions to this were the mobilisation of Ni and Cd into the overlying water which was much more effective when seawater was used to inundate these sediments.

5.3.6 Inundation of the Tolderol soil material (Site 6)

5.3.6.1 Sediment characteristics

The sediment characteristics of the Tolderol soil material (Site 6) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-117 to 9-136).

5.3.6.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Tolderol soil material (Site 6) with both River Murray water and seawater are given in Appendix 4 (Tables 9-467 to 9-496).

5.3.6.3 Discussion of results of inundation

5.3.6.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-117 to 9-136)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer (with abundant diffuse orange segregations) 0-7 cm thick with a pH of 6.4, with the remaining 8 cm consisting of a beige sand (with occasional orange segregations) with a pH of 3.5.

- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.

- Titratable Actual Acidity (TAA) were negligible for the upper soil layers (i.e. < 3.0 mol H^+/tonne) as would be expected given the neutral/alkaline pH of these soil materials. However, the TAA was also < 3.0 mmol H^+/ tonne for the lower soil layer which had initially very acidic pore-waters (pH of ~3.4).

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality - the main apparent changes to the solid phase observed during this relatively short inundation were:

    - Decreases in both total and HCl-extractable Zn in the soils inundated with either seawater or River Murray water.

5.3.6.3.1 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-467 to 9-496) show the following main findings:

- The inundation of this soil material by River Murray water induced a small reduction in the pH of the inundating waters from ~7.7 to 6.6 at day 18 after which the pH started to increased back to 7.7 after 136 days of inundation (Figure 5-71).

- The inundation of this soil material by seawater induced an immediate and substantial reduction in the pH of the inundating water down to ~5.0 after 2 hours, after which the pH steadily increased to ~7.6 by day 136 of inundation (Figure 5-71).

- Reducing conditions rapidly developed in the underlying sediments inundated by both waters and this decreased the Eh in the inundating waters to a lesser extent. This effect was much more pronounced in the upper sediment pore-waters when the inundating water was River Murray water.

- Alkalinity in the pore-waters (especially the acidic lower pore-waters) was much lower than in the inundating waters during the initial period of inundation. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the inundation (Figure 5-72).

- Iron mobilisation was only slight during the initial stages of inundation in the pore-waters. During the latter stages of inundation iron mobilsation was strong in the pore-waters of the soils inundated by River Murray. Iron mobilisation was not observable in the inundating waters (Figure 5-73).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-782, Appendix 6).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 25 days for the seawater, respectively) but to levels below the appropriate ANZECC trigger values (Figure 5-74). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion. The mobilisation of NH_3 was more pronounced when seawater was the inundating water.

- NO_3 concentrations increased markedly in the inundation waters throughout the 136 day incubation in the inundating waters.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-75 - 5-79). The concentrations of these metals in the pore-waters suggest that the increase of the metals in the inundating waters was via upwards diffusion.

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-80).

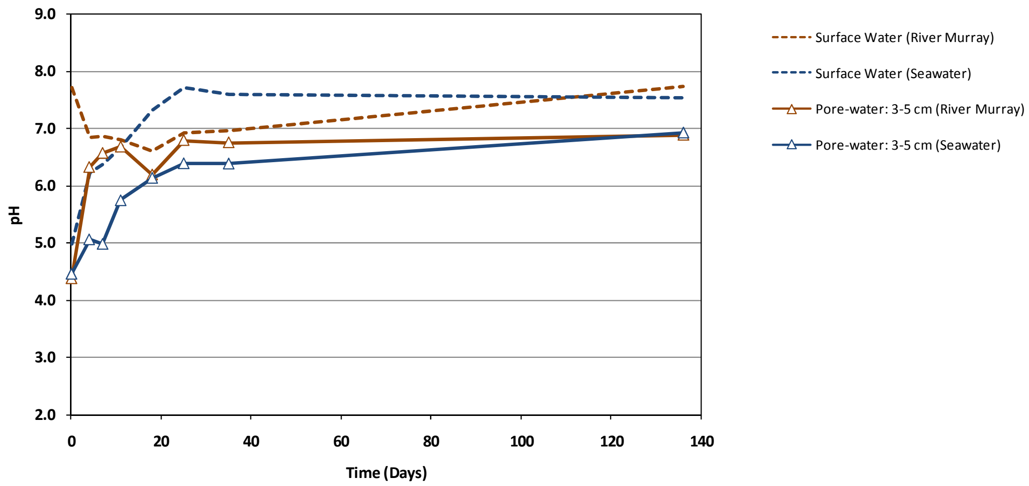

Figure 5-71. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

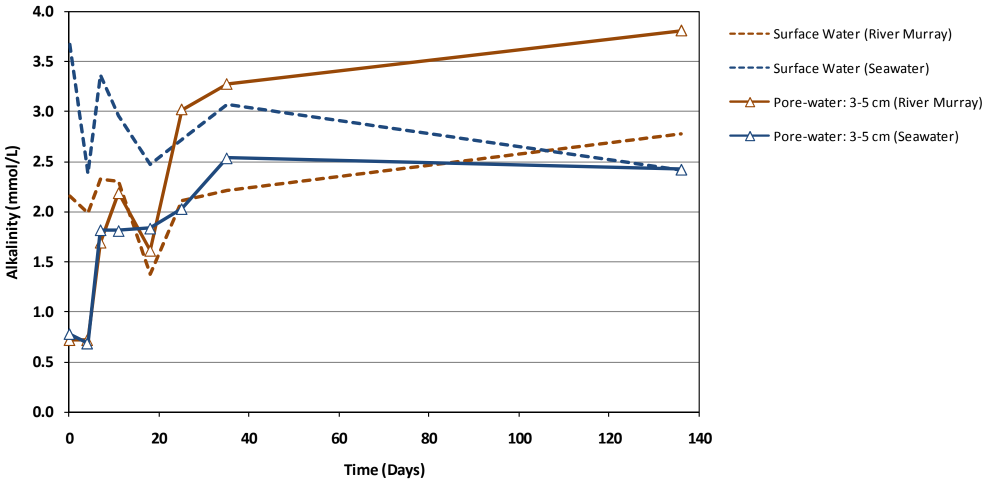

Figure 5-72. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

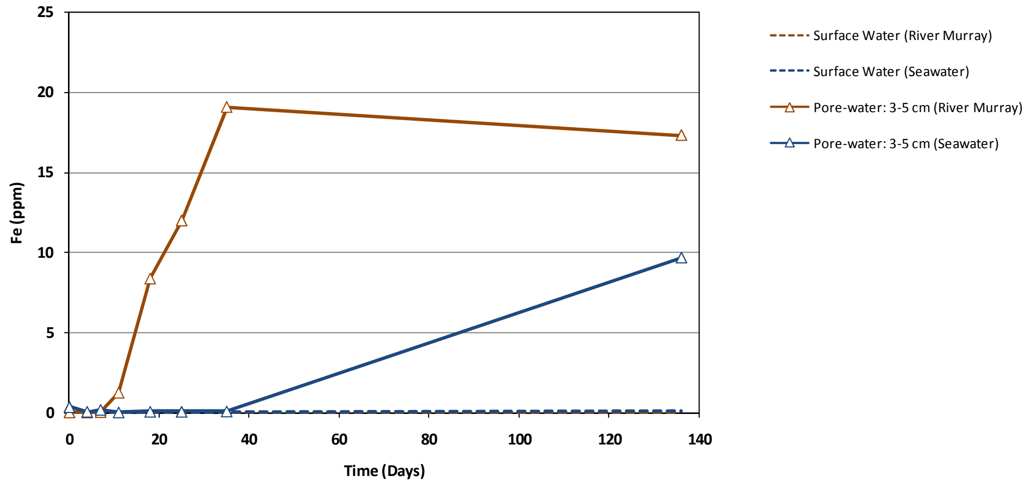

Figure 5-73. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

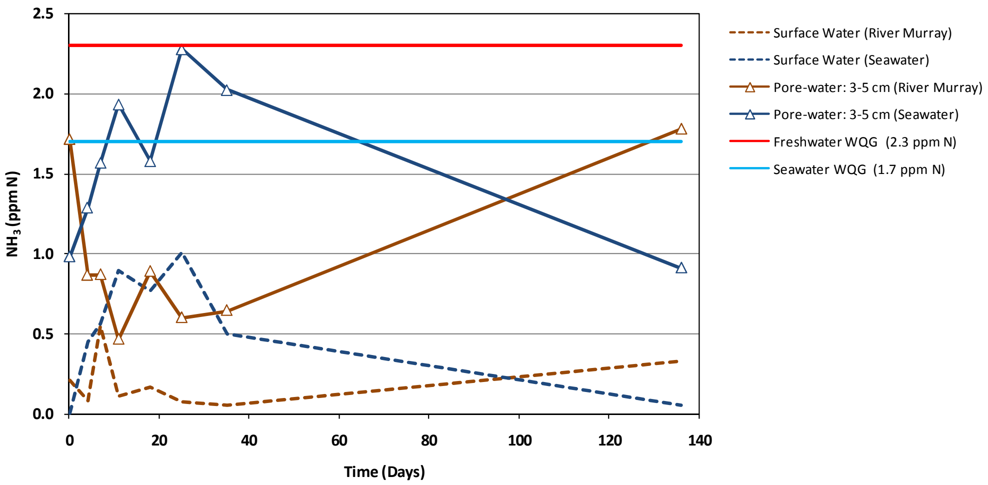

Figure 5-74. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

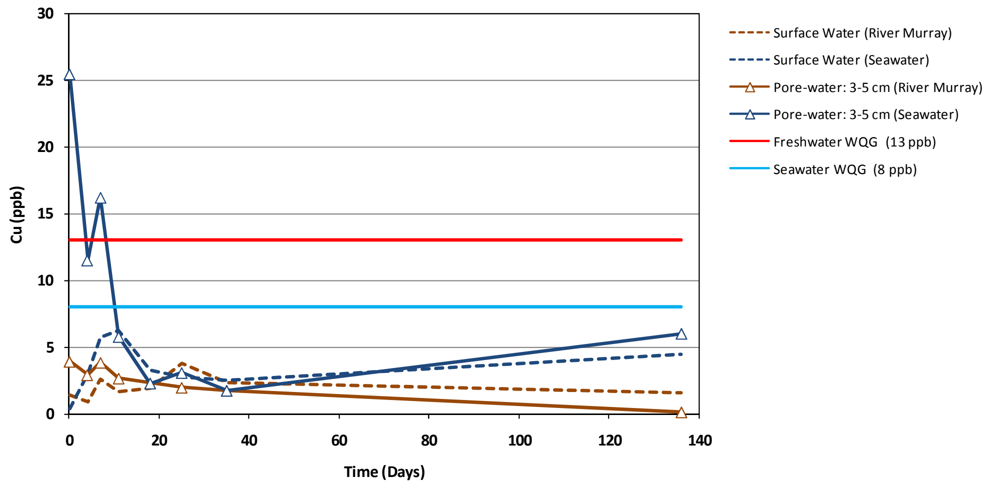

Figure 5-75. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

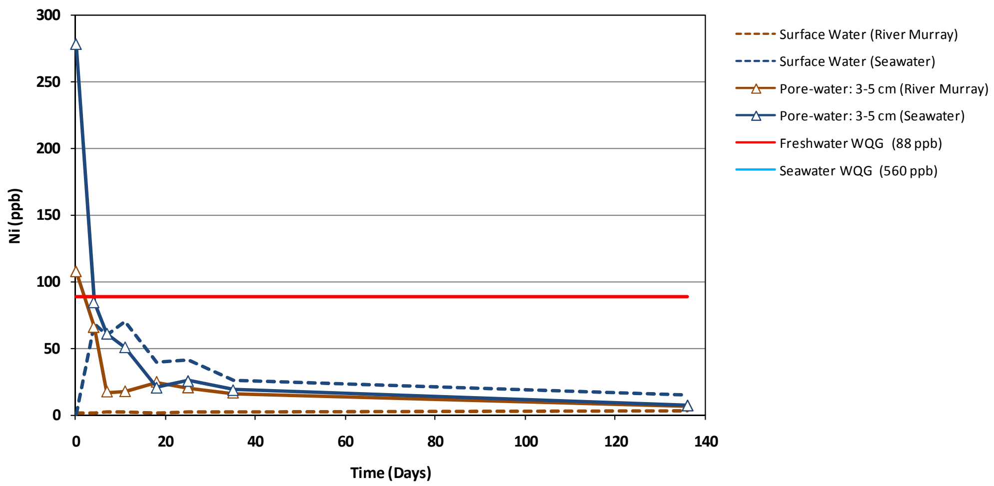

Figure 5-76. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

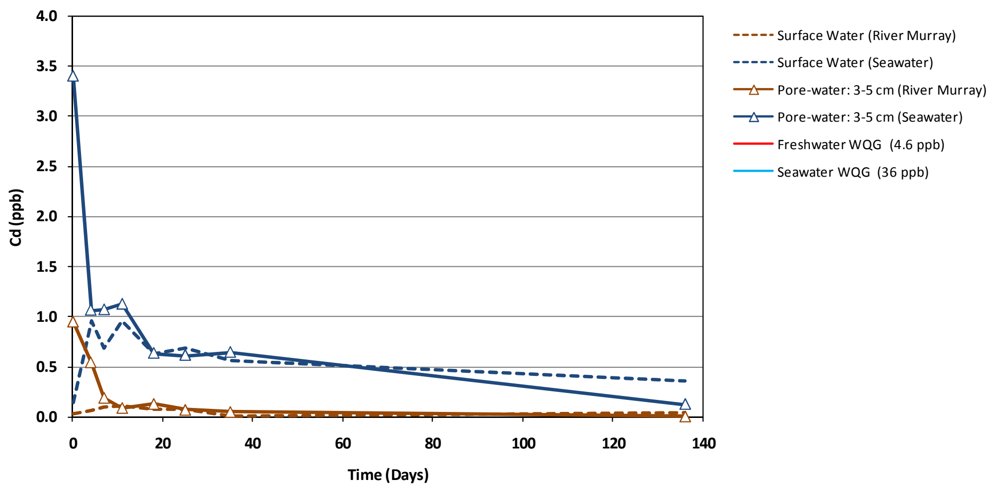

Figure 5-77. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

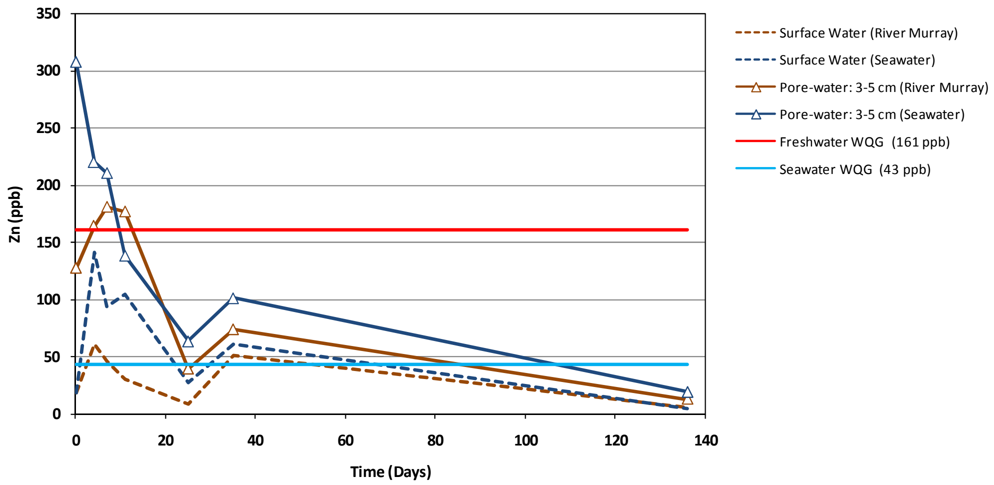

Figure 5-78. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

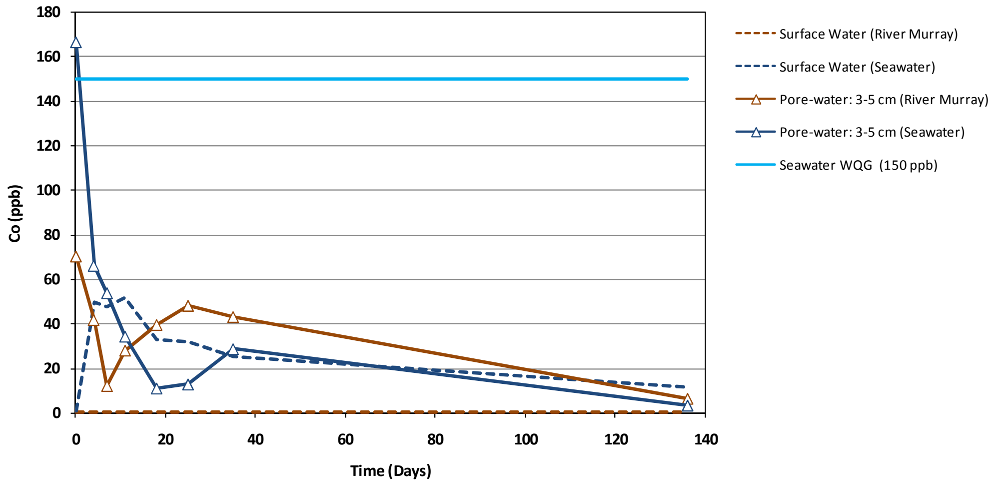

Figure 5-79. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

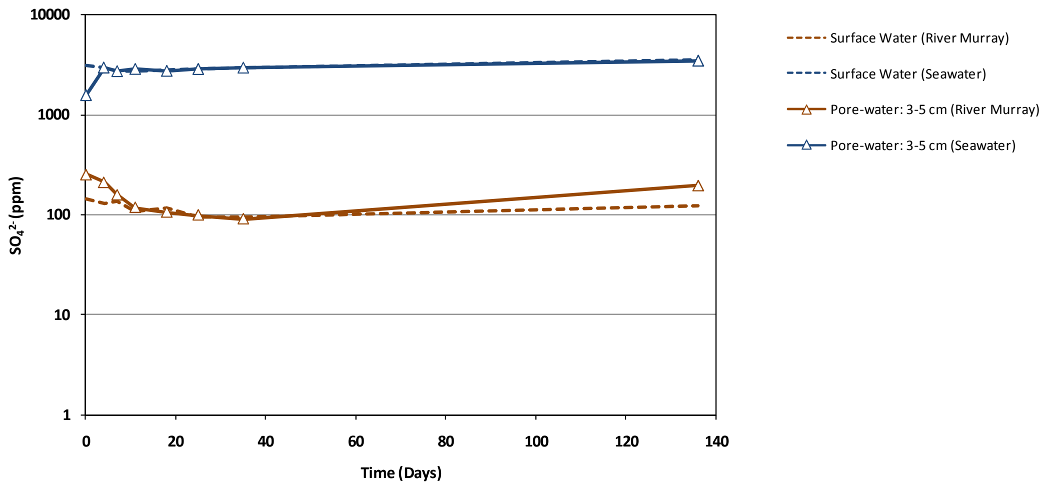

Figure 5-80. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

5.3.6.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters during the inundation.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Ni, NH_3, Cu, Mn, Cd, Pb, Co and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as this one) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.6.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) affected the acidification and the mobilisation of potential contaminants into the inundating waters during the experimental timescale. Acidification of the inundating seawater was stronger (down to pH 4.98) after 2 hours of inundation than with the River Murray water. Mobilisation of Mn, Cu, As, Cd, Pb and NO_3 into the inundating waters were stronger when seawater was used. Conversely, Fe mobilisation into the pore-water was much stronger after inundation with River Murray water.

5.3.7 Inundation of the Point Sturt (South) soil material (Site 7)

5.3.7.1 Sediment characteristics

The sediment characteristics of the Point Sturt (South) soil material (Site 7) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-137 – 9-156).

5.3.7.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Point Sturt (South) soil material (Site 7) with both River Murray water and seawater are given below in Appendix 4 (Tables 9-497 – 9-526).

5.3.7.3 Discussion of results of inundation

5.3.7.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-137 – 9-156)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer (with abundant orange segregations) 0-5 cm thick with a pH of 3.6, with the remaining 8 cm consisting of a light grey sand (with occasional orange segregations) with a pH of 3.5.
- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water. (Longer term sulfide accumulation trends will be investigated by an associated study of these columns separate from this report.)
- Titratable Actual Acidity (TAA) were low (i.e. < 10.0 mol H^+/tonne) despite the very acidic pore-waters in these soil materials (e.g. pH of ~2.5).
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.7.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-497 – 9-526) show the following main findings:

- The inundation of this soil material by River Murray water induced a small reduction in the pH of the inundating waters from ~6.7 to 6.2 at day 25 followed by a slow increase to a pH of ~7.0 by day 136 (Figure 5-81).
- The inundation of this soil material by seawater induced an immediate and substantial reduction in the pH of the inundating water down to ~6.0 after 2 hours, after which the pH slowly increased by day 35 to 6.4 and decreased to ~5.0 by day 136 (Figure 5-81).
- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the more alkaline inundating waters decreased to a greater extent.
- Alkalinity in the pore-waters (especially the acidic lower pore-waters) was much lower than in the inundating waters during the initial period of inundation. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the inundation (Figure 5-82).
- Iron mobilisation was relatively slight during the initial 25 days of inundation in the uppermost pore-waters but rapidly increased thereafter. Iron mobilisation was not observable in the inundating waters (Figure 5-83).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-783, Appendix 6).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and after 25 days for the seawater, respectively) but to levels below the appropriate ANZECC trigger values (Figure 5-84). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentrations of Zn and Cu (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-85 - 5-88). The concentrations of these metals in the pore-waters suggest that the increase of the metals in the inundating waters was via upwards diffusion.

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-89).

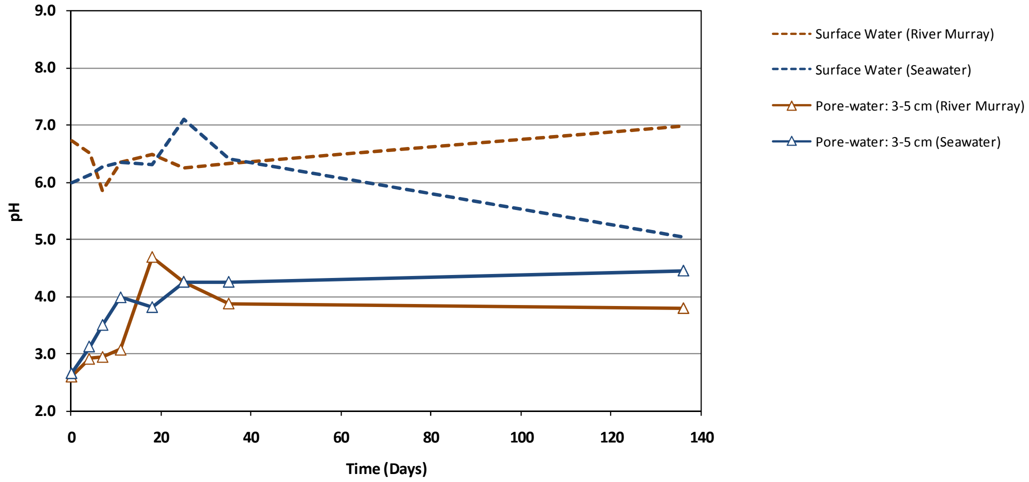

Figure 5-81. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

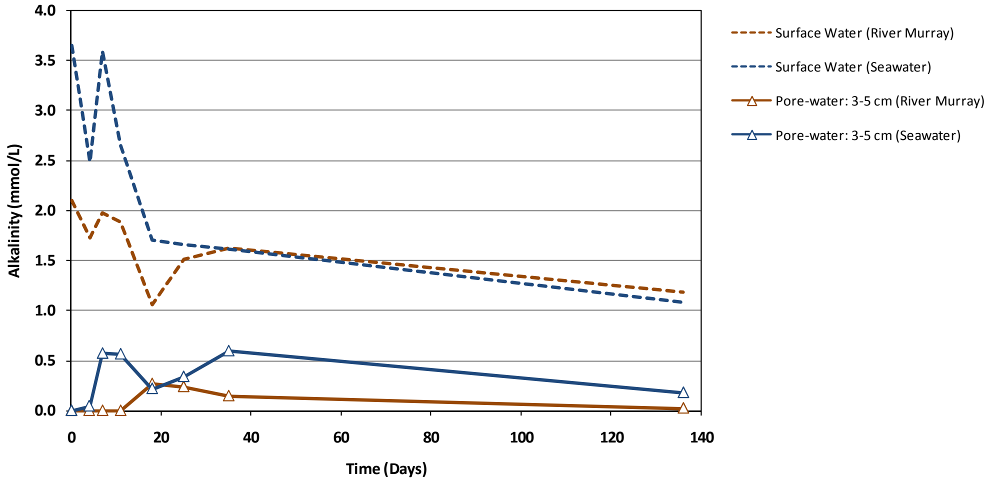

Figure 5-82. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

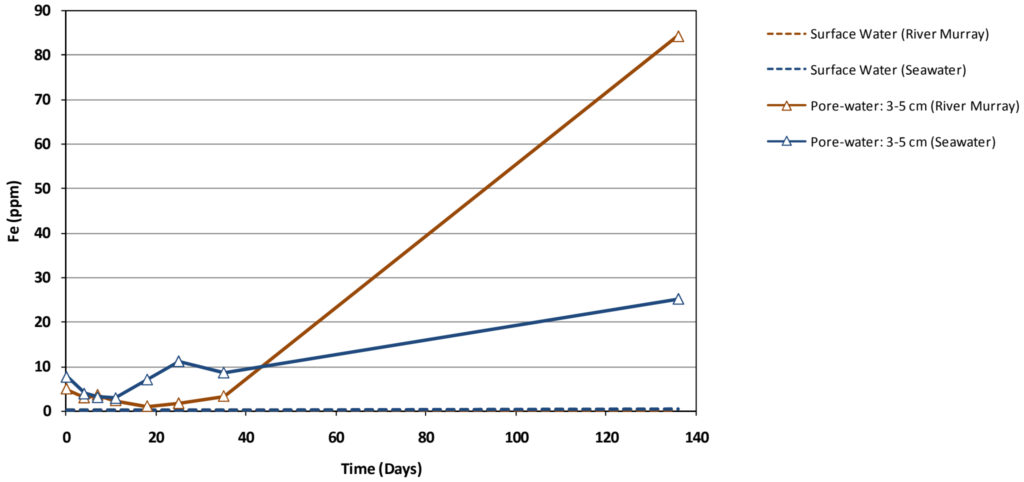

Figure 5-83. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

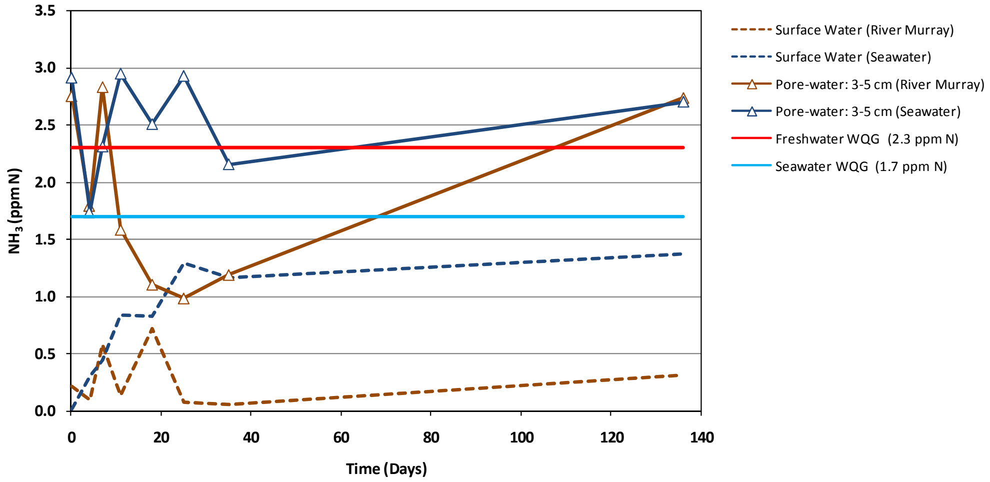

Figure 5-84. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

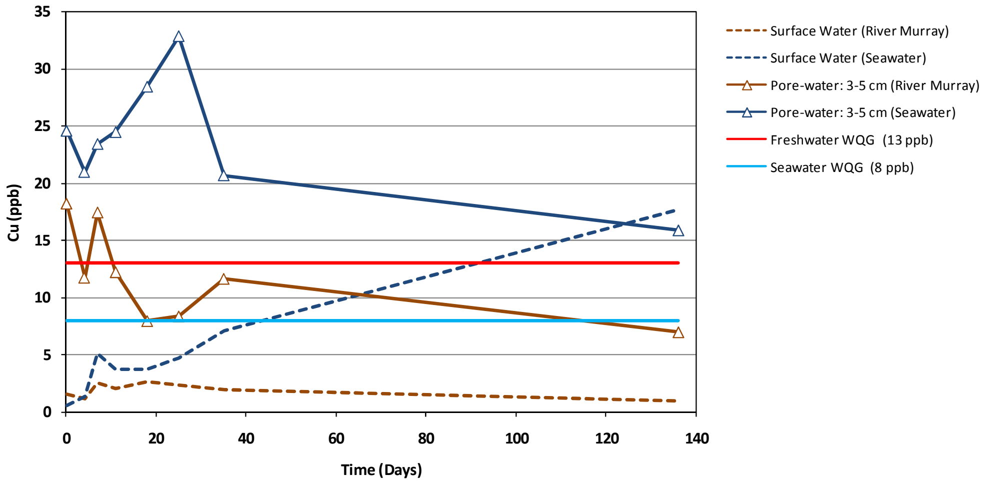

Figure 5-85. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted).

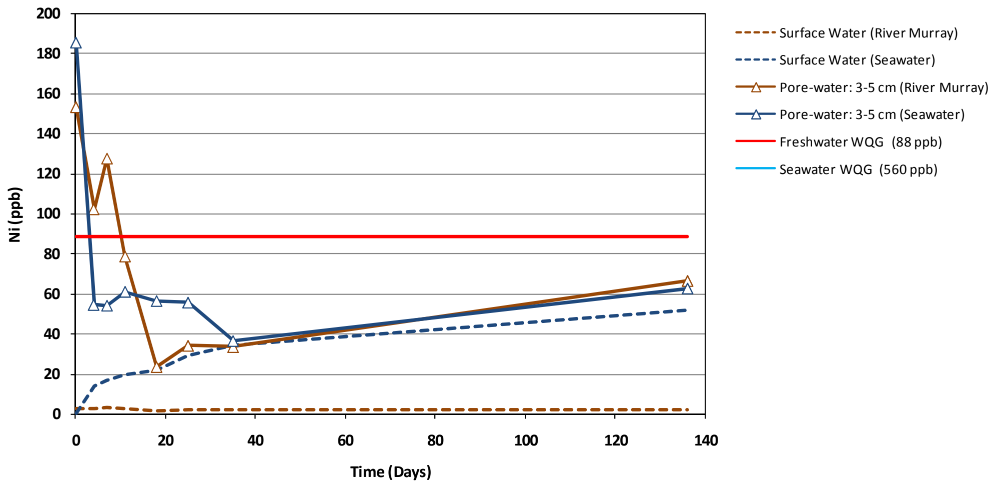

Figure 5-86. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

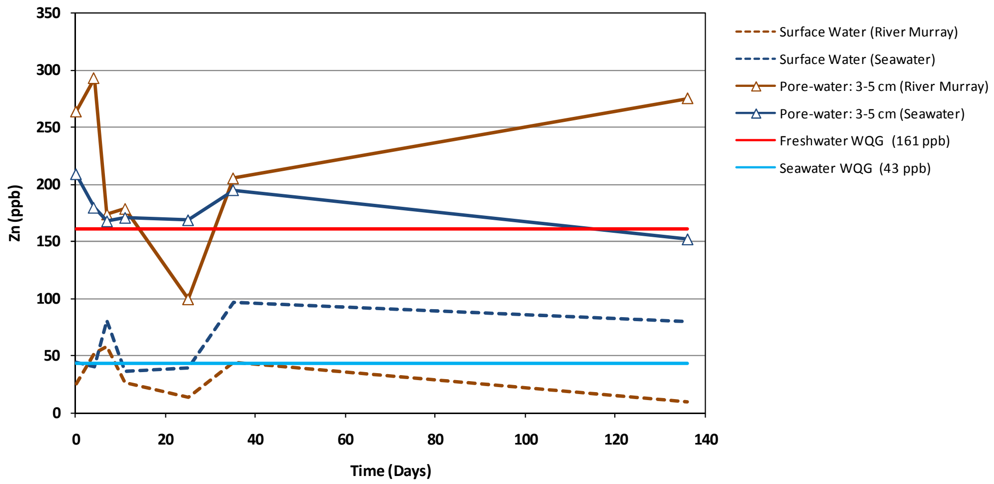

Figure 5-87. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

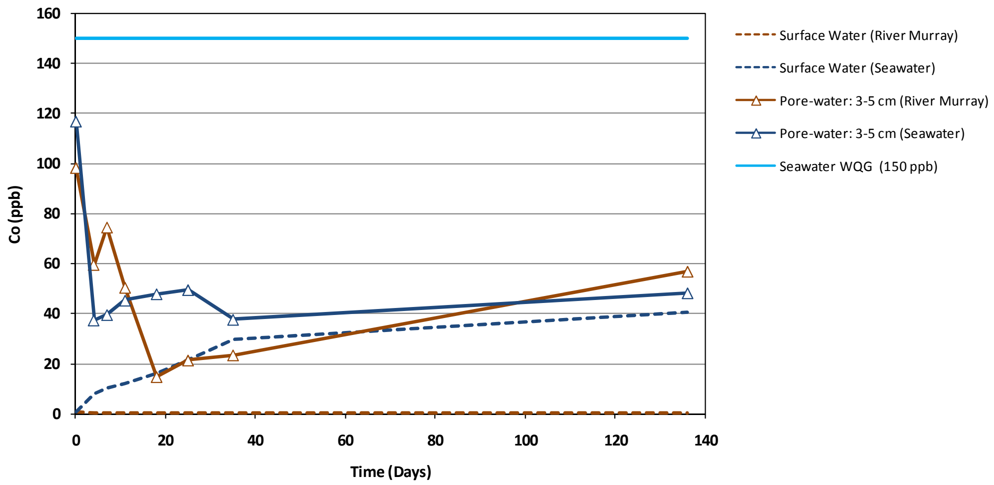

Figure 5-88. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted).

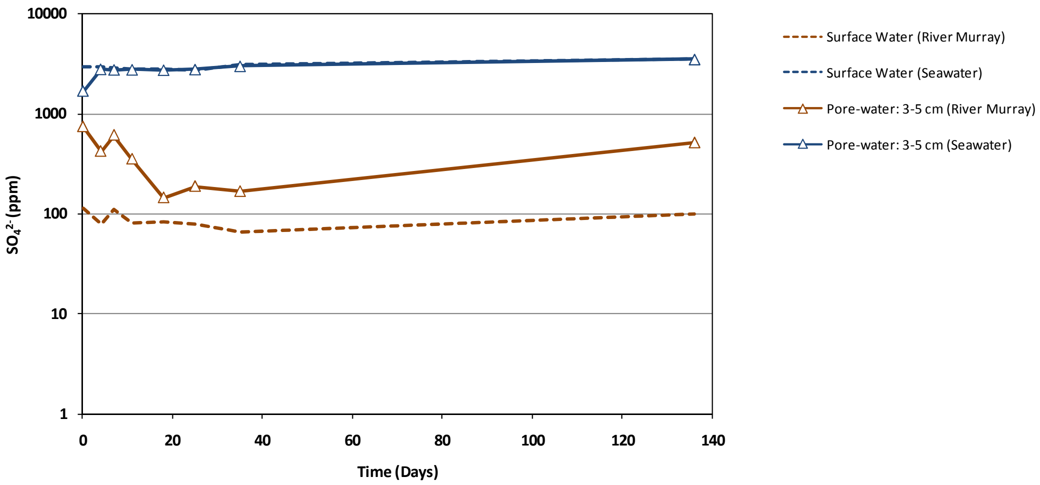

Figure 5-89. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

5.3.7.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale are the elevated concentrations of Cu and Zn (both in inundating seawater only) in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Cr, Co, Cd, Ni and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as this one) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.7.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This salinity caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The uppermost pore-waters in these sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) affected the acidification and the mobilisation of potential contaminants into the inundating waters during the experimental timescale. Acidification of the inundating seawater was slightly stronger (down to pH 5.98) after 2 hours of inundation than with the River Murray water. Mobilisation of Ni, NH_3 and Cu into the inundating waters were stronger when seawater was used. Conversely, Mn mobilisation into the inundating waters was much stronger after inundation with River Murray water.

5.3.8 Inundation of the Point Sturt (North) soil material (Site 8)

5.3.8.1 Sediment characteristics

The sediment characteristics of the Point Sturt (North) soil material (Site 8) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-157 – 9-176).

5.3.8.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Point Sturt (North) soil material (Site 8) with both River Murray water and seawater are given in Appendix 4 (Tables 9-527 – 9-556).

5.3.8.3 Discussion of results of inundation

5.3.8.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-157 – 9-176)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer 0-6 cm thick with a pH of 3.4, underlain by a 5 cm thick beige sand layer with a pH of 3.1, with the remaining 8 cm consisting of a beige sand layer (with abundant jarositic mottles) with a pH of 3.0.

- Sulfides were at very low levels in the soil materials prior to inundation and had only accumulated in very minor amounts in the upper soil layers during the 136 days of inundation with River Murray water.

- Titratable Actual Acidity (TAA) were low (i.e. < 8.0 mol H^+/tonne) despite the very acidic pore-waters in these soil materials (e.g. pH of ~2.5).

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.8.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-527 – 9-556) show the following main findings:

- The inundation of this soil material by River Murray water induced reduction in the pH of the inundating waters from ~7.0 after 2 hours to 5.89 at the end of the 35 days of inundation and thereafter to 6.26 after 136 days of inundation (Figure 5-90).

- The inundation of this soil material by seawater induced an immediate and substantial reduction in the pH of the inundating water down to ~6.0 after 2 hours, after which the pH slowly decreased to 5.43 at day 11. Thereafter the pH of the inundating seawaters then increased to 6.42 by day 35 and thereafter decreased to a pH of 4.3 after 136 days of inundation. (Figure 5-90).

- The pH of the uppermost pore-waters after River Murray water inundation increased from ~2.7 after 2 hours to 3.56 by day 35 and to 4.61 by day 136. The uppermost pore-waters after seawater inundation increased from ~4.0 to 5.70 by day 35 and then 4.52 by day 136 (Figure 5-90).

- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the inundating waters decreased to a similar extent.

- Alkalinity in the pore-waters (especially the acidic lower pore-waters) was much lower than in the inundating waters during the initial period of inundation. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water throughout the inundation (Figure 5-91).

- Iron mobilisation was strong during the inundation in the pore-waters and was observable in albeit at very small concentrations in the inundating waters (Figure 5-92).

- NO_3^- mobilisation was much stronger in the inundating River Murray water than the seawater (Figure 5-93).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-784, Appendix 6).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 136 days for the seawater, respectively). The NH_3 concentrations just exceeded the appropriate ANZECC trigger value for seawater at days 11 to 35 only (Figure 5-94). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Cu (seawater inundation only) and Zn (seawater inundation only) exceeded the appropriate ANZECC trigger values (e.g. Figures 5-95 – 5-99). The concentrations of these metals in the pore-waters suggest that the increase of the metals in the inundating waters was via upwards diffusion.

- There were marked depletions of SO_4 in the surface soil layer pore-waters during inundation with River Murray water (Figure 5-100).

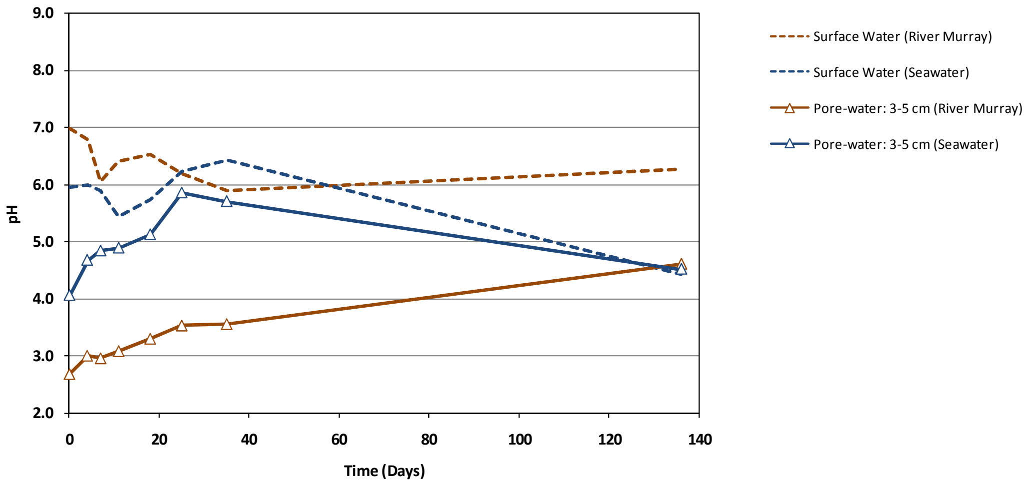

Figure 5-90. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

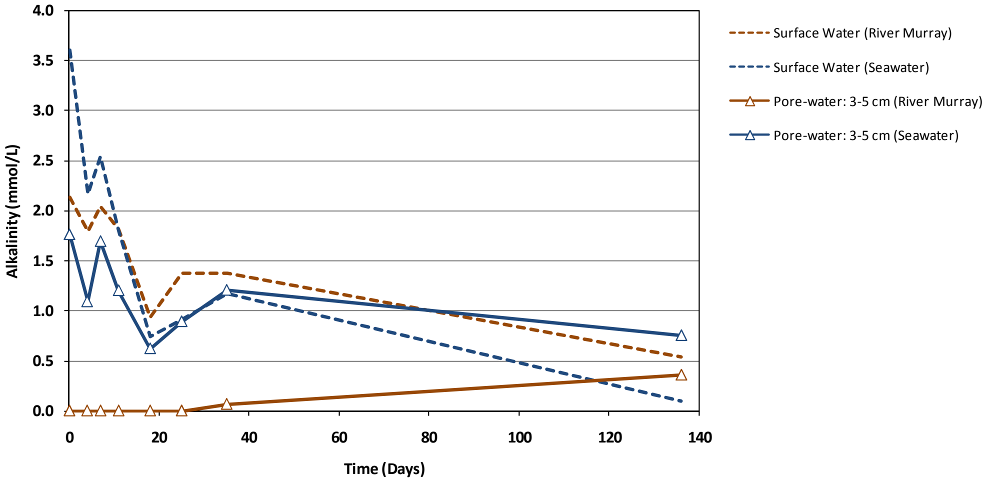

Figure 5-91. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

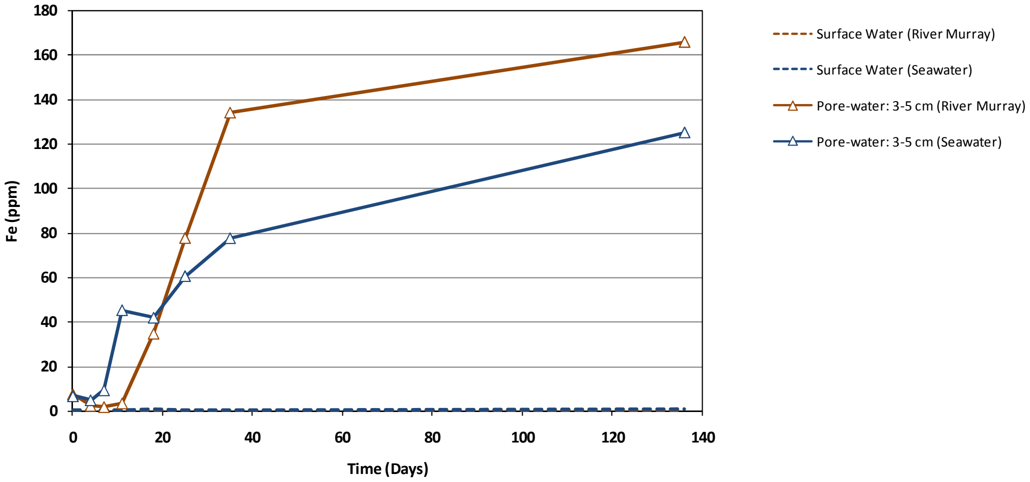

Figure 5-92. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

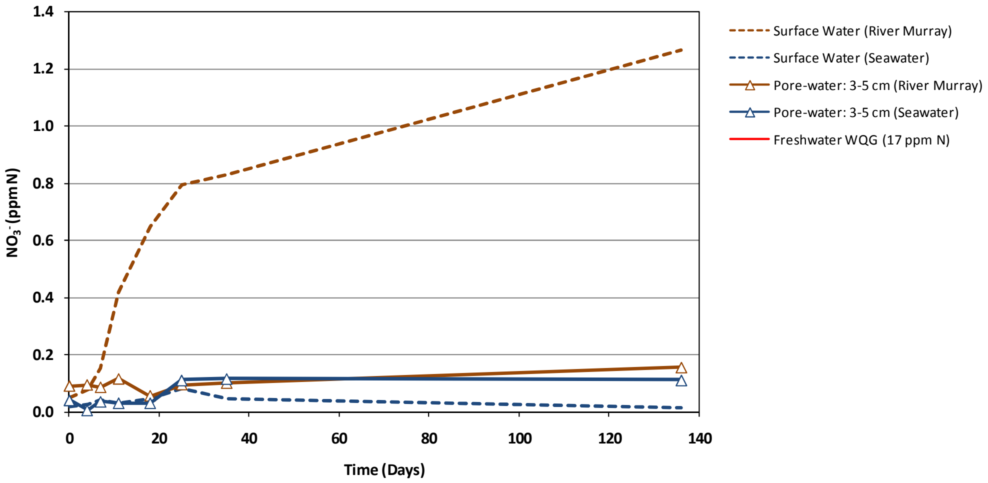

Figure 5-93. Nitrate (NO_3^-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. all values below the freshwater WQG trigger value).

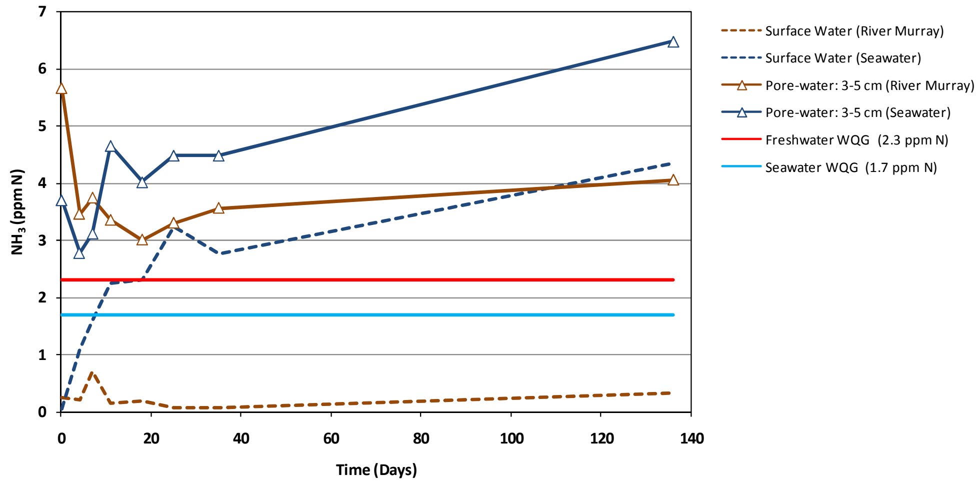

Figure 5-94. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

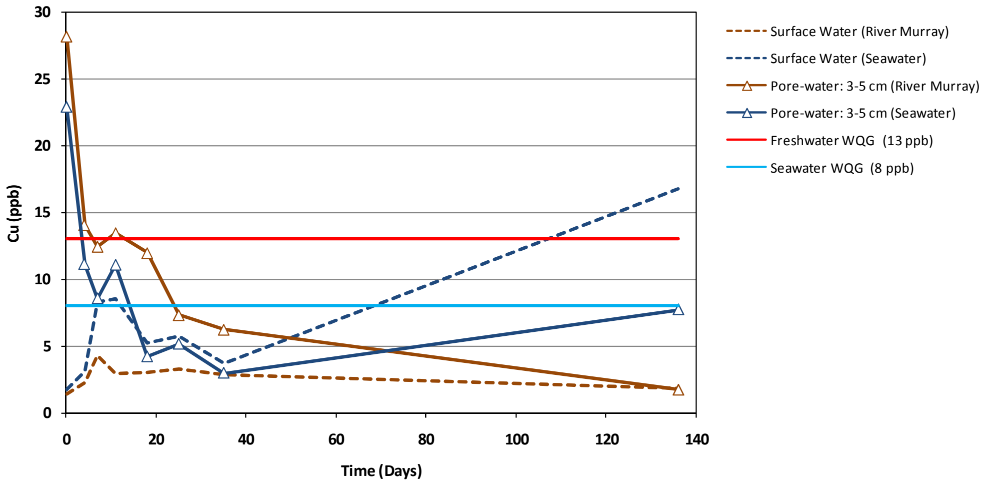

Figure 5-95. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted).

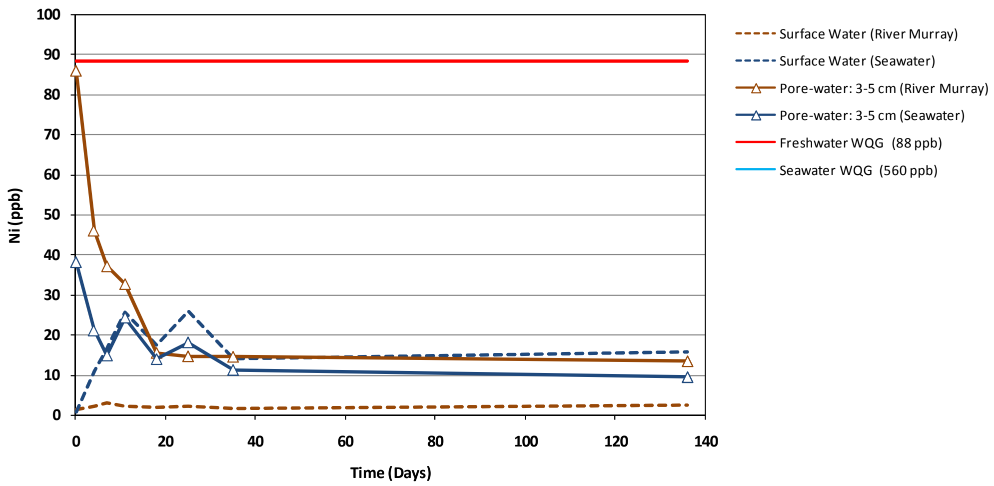

Figure 5-96. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

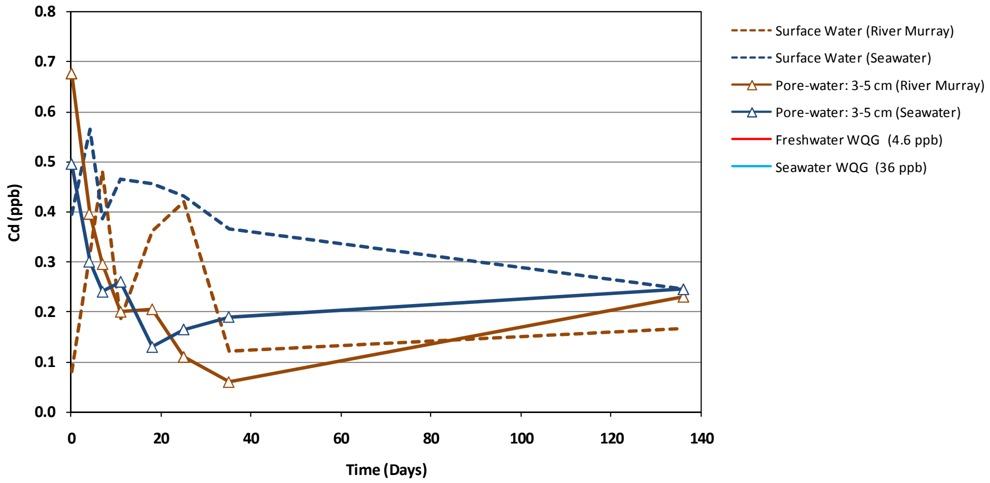

Figure 5-97. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

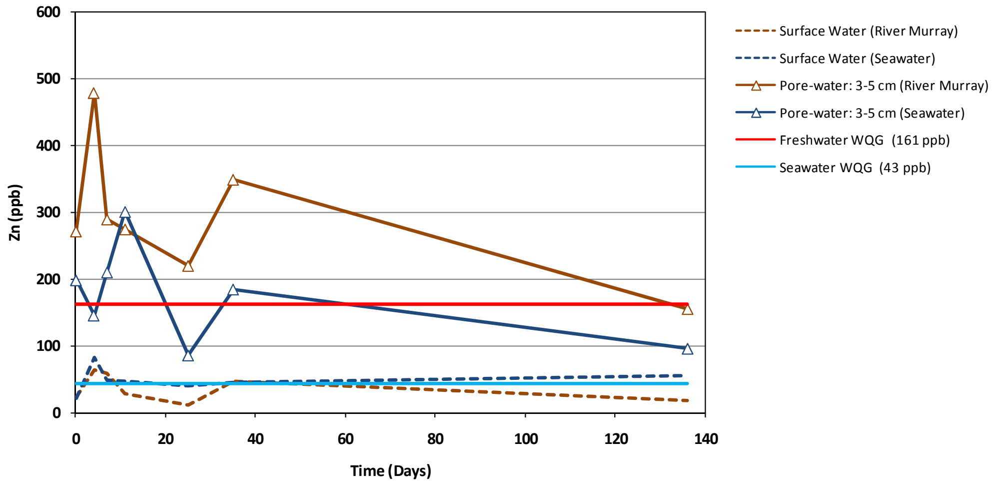

Figure 5-98. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

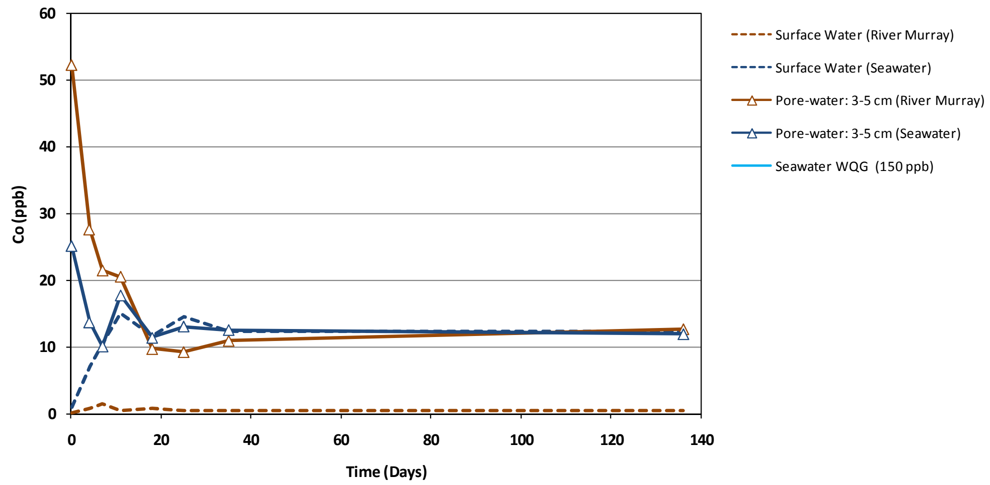

Figure 5-99. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

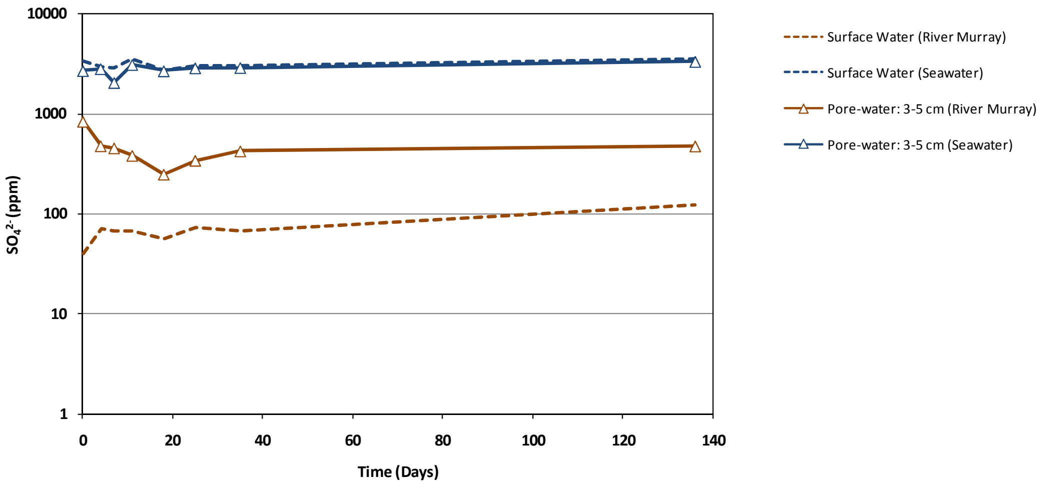

Figure 5-100. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

5.3.8.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale are the elevated concentrations of NH_3, Cu and Zn, and the diminishing alkalinities in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of As, Ni, NH_3, Mn, Cu and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.8.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in the upper layer of the sediment were becoming relatively depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) affected the acidification and the mobilisation of potential contaminants into the inundating waters during the experimental timescale. Acidification of the inundating waters was stronger until 136 days of inundation when seawater was used than when River Murray water was used. Mobilisation of Ni, NH_3, and Cu into the inundating waters were stronger when seawater was used. Conversely, mobilisation NO_3^- into the inundating waters were stronger when River Murray was used.

5.3.9 Inundation of the Point Sturt (North) soil material (Site 9)

5.3.9.1 Sediment characteristics

The sediment characteristics of the Point Sturt (North) soil material (Site 9) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-177 – 9-196).

5.3.9.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Point Sturt (North) soil material (Site 9) with both River Murray water and seawater are given in Appendix 4 (Tables 9-557 – 9-586).

5.3.9.3 Discussion of results of inundation

5.3.9.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-177 – 9-196)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer 0-11 cm thick with a pH of 5.7, with the remaining 4 cm consisting of a beige sand layer (with frequent orange segregations) with a pH of 6.3.
- Sulfides were at very low levels in the soil materials prior to inundation and had not formed nor accumulated during the 136 days of inundation with either seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. <0-5 mol H^{+}/ tonne) as would be expected given the neutral pH of these soil materials.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.9.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-557 – 9-586) show the following main findings:

- The inundation of this soil material by River Murray water induced a slight reduction in the pH of the inundating waters from ~7.0 after 2 hours to ~6.4 at the end of the 35 days of inundation and 7.5 at day 136 (Figure 5-101).
- The inundation of this soil material by seawater induced an immediate and substantial reduction in the pH of the inundating water down to ~5.8 after 2 hours, after which the pH slowly increased to ~7.8 by day 35 and 7.1 at day 136 (Figure 5-101).
- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the waters decreased more when seawater was used to inundate the sediments.
- Alkalinity in the pore-waters increased during the inundation. Whereas the alkalinity in the inundating water remained relatively constant during the incubation. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the inundation (Figure 5-102).
- Iron mobilisation into the pore-waters was slight during the inundation and was generally not observable in the inundating waters (Figure 5-103).
- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-785, Appendix 6).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The NH_3 concentrations did not exceed the appropriate ANZECC trigger value (Figure 5-104).

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-105 – 5-106).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-107).

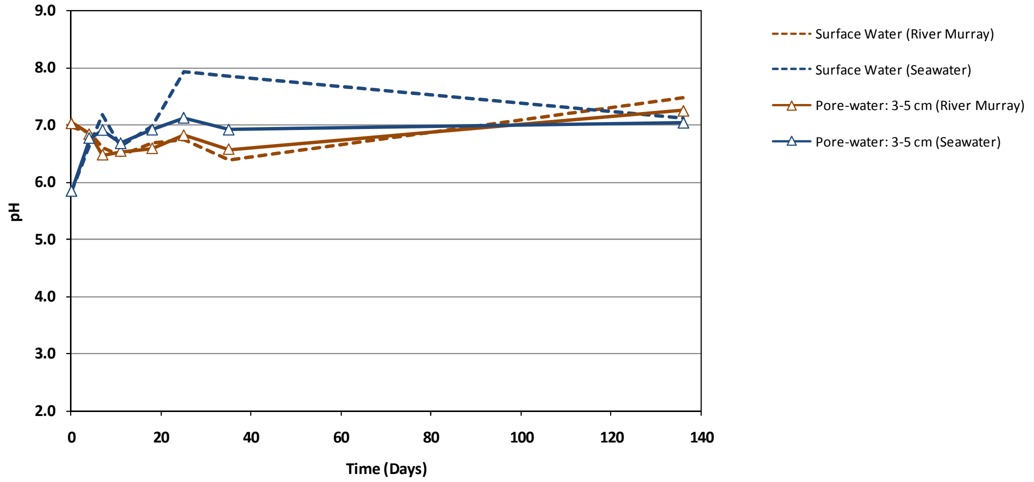

Figure 5-101. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

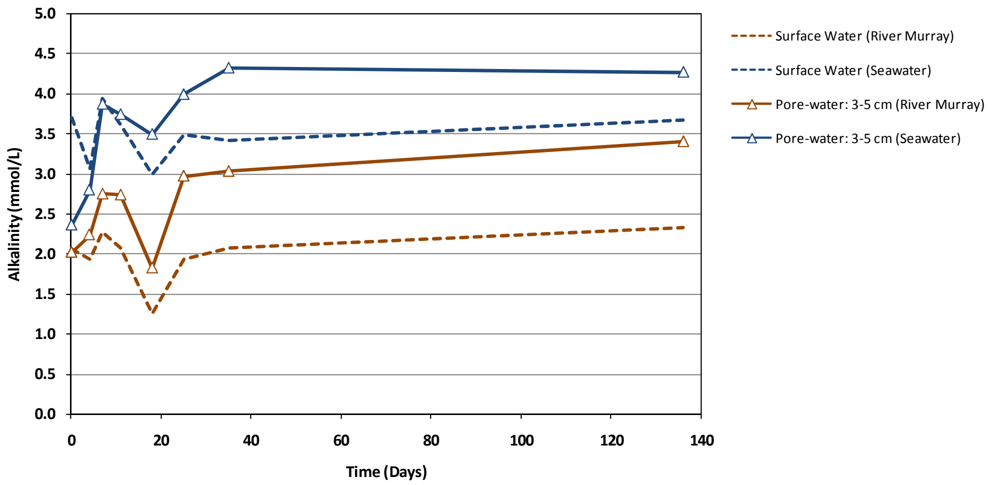

Figure 5-102. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

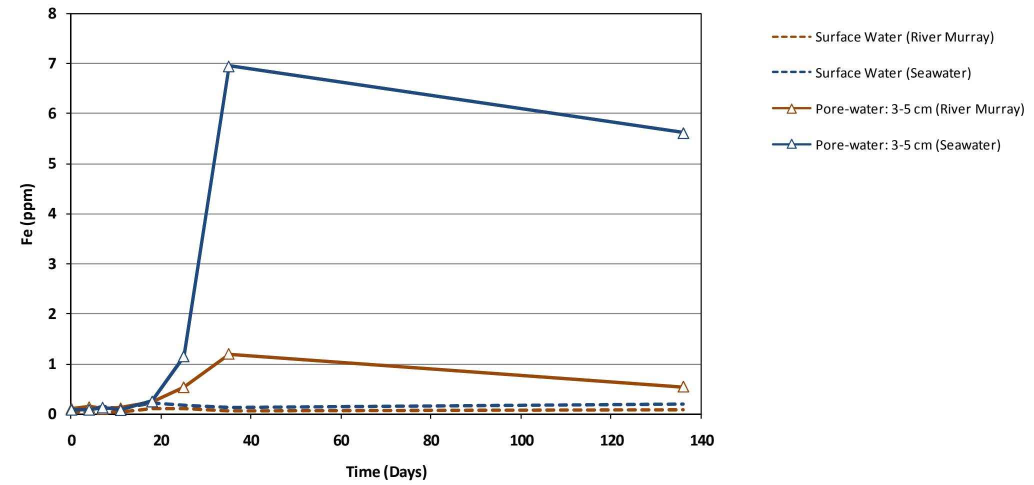

Figure 5-103. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

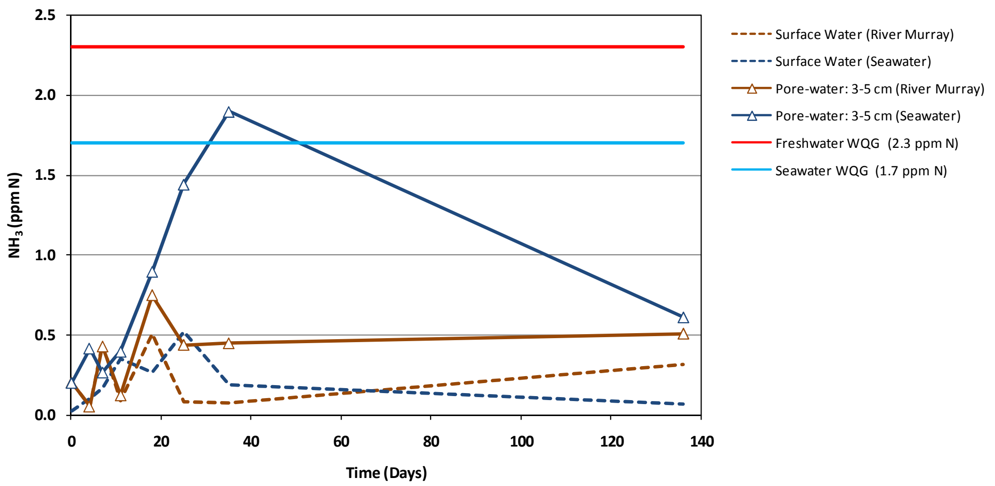

Figure 5-104. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

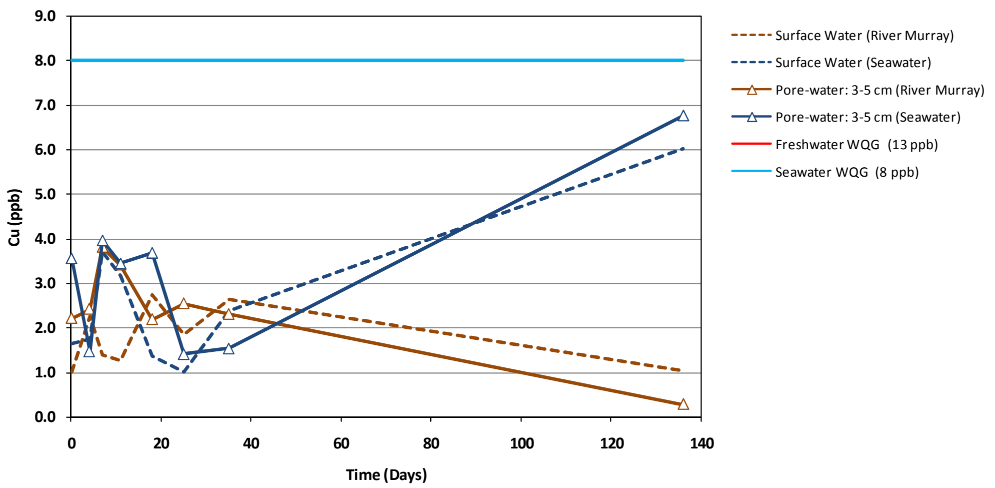

Figure 5-105. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

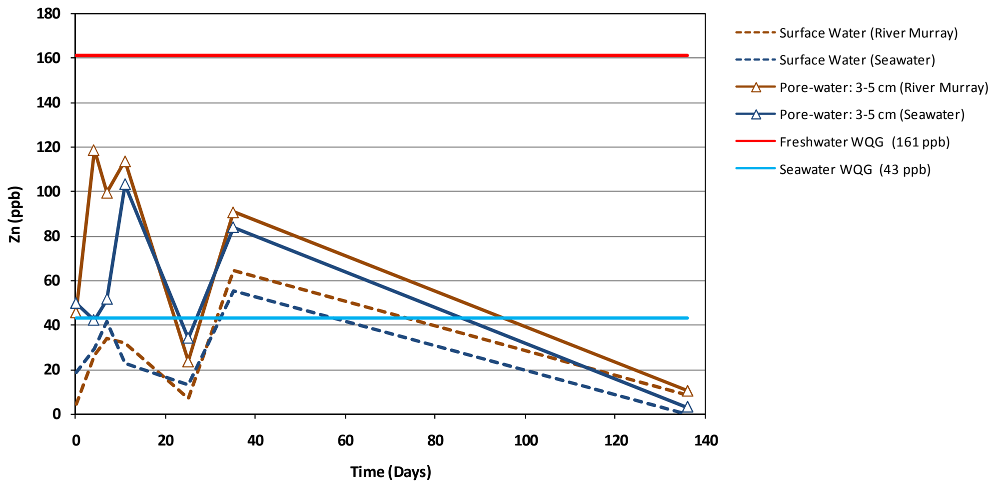

Figure 5-106. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9 (n.b. data below the laboratory LOD plotted).

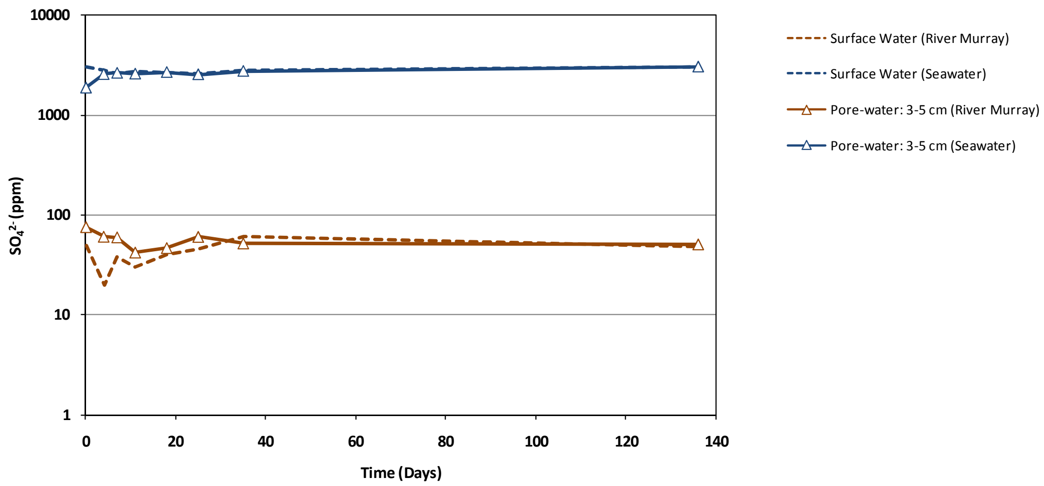

Figure 5-107. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

5.3.9.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the concentration of Zn in the overlying seawater.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of NH_3 and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.9.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the type of inundating water (i.e. River Murray water or seawater) only slightly affected the acidification and the mobilisation of potential contaminants from the sediments into the inundating waters during the experimental timescale.

5.3.10 Inundation of the Milang soil material (Site 10)

5.3.10.1 Sediment characteristics

The sediment characteristics of the Milang soil material (Site 10) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-197 – 9-216).

5.3.10.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Milang soil material (Site 10) with both River Murray water and seawater are given in Appendix 4 (Tables 9-587 – 9-616).

5.3.10.3 Discussion of results of inundation

5.3.10.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-197 – 9-216)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer 0-5 cm thick with a pH of 4.1, underlain by a beige sand layer 6 cm thick with a pH of 3.8, with the remaining 4 cm consisting of a light gray and dark grey banded sand layer with a pH of 4.8.
- Sulfides were at very low levels in the soil materials prior to inundation and had accumulated only slightly during the 136 days of inundation with both seawater or River Murray water.
- Titratable Actual Acidity (TAA) were low (i.e. < 4.0 mol H^+/tonne) despite the very acidic pore-waters in these soil materials especially in the lower sediment layer (e.g. pH as low as 3.3).
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase observed during the inundation.

5.3.10.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-587 – 9-616) show the following main findings:

- The inundation of this soil material by River Murray water induced a slight reduction in the pH of the inundating waters from ~6.7 after 2 hours to ~6.4 after 18 days of inundation followed by a rise in pH to 7.4 after 136 days (Figure 5-108).
- The inundation of this soil material by seawater induced an immediate reduction in the pH of the inundating water down to ~6.4 after 2 hours, after which the pH slowly increased to a stable~7.1 by day 35 (Figure 5-108).
- The pH of the uppermost sediment layer sampled increased rapidly from ~3.9 after 2 hours to ~6.6 after 136 days in the case of the sediment inundated by River Murray water and from ~5.7 after 2 hours to 6.7 after 136 days in the case of the sediment inundated by seawater (Figure 5-108).
- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the inundating waters decreased to a slightly lesser extent.

- The alkalinity in the inundating waters remained relatively constant during the inundation but the alkalinity of the pore-waters was substantially lowered immediately after the initial inundation; this was more pronounced in the sediments inundated by River Murray water. The alkalinity of these pore-waters gradually increased with duration of inundation (Figure 5-109).

- Iron mobilisation was strong during the initial 35 days of inundation in the pore-waters, after which it diminished, but was not observable in the inundating waters throughout the experimental period(Figure 5-110).

- NO_3^- concentrations increased considerably - and more so in the inundating seawater water than in the inundating River Murray - during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-111).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 11 days for the seawater, respectively). The NH_3 concentrations exceeded the appropriate ANZECC trigger values for seawater at days 4 to 25 only (Figure 5-112). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the surface waters tested. However, sulfide was detected at concentrations of up to 151 ppb in the pore-waters of the inundated sediments (see Table 9-786, Appendix 6).

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentrations of Cu and Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-113 – 5-116).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-117).

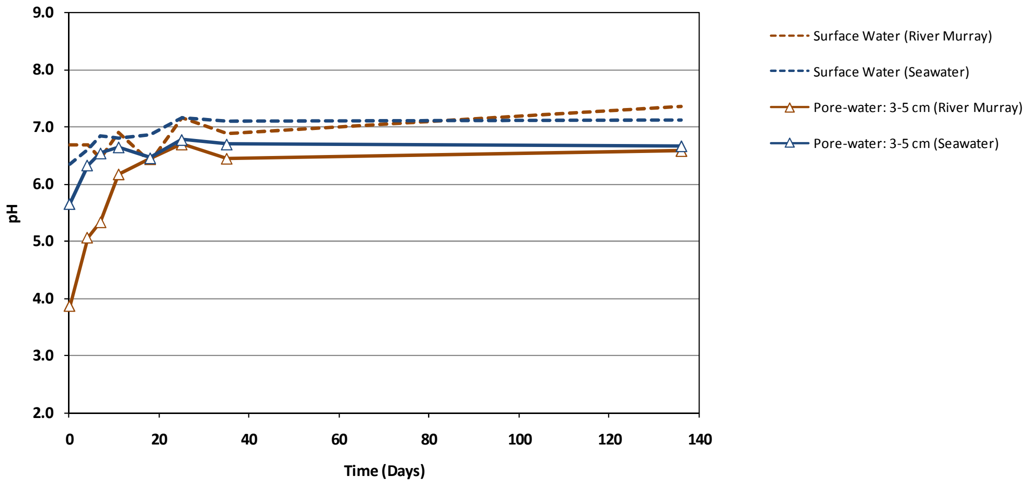

Figure 5-108. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

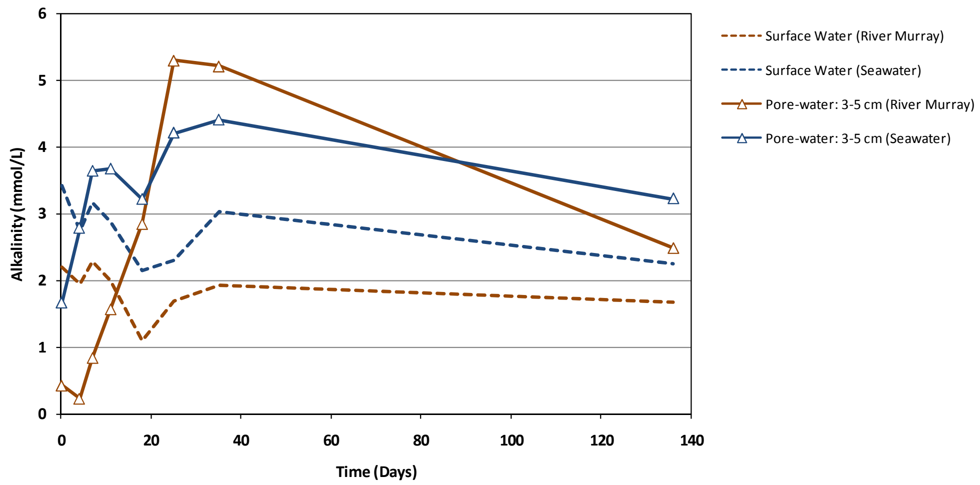

Figure 5-109. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

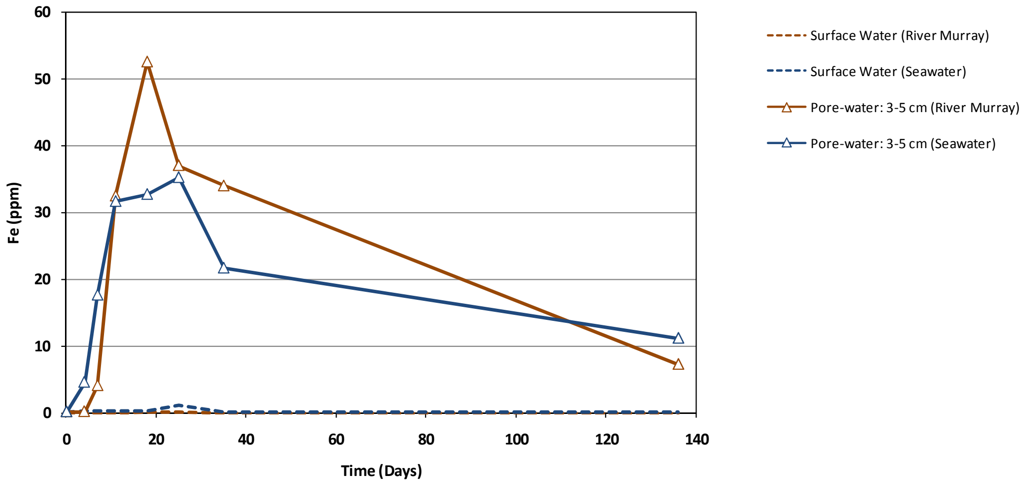

Figure 5-110. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

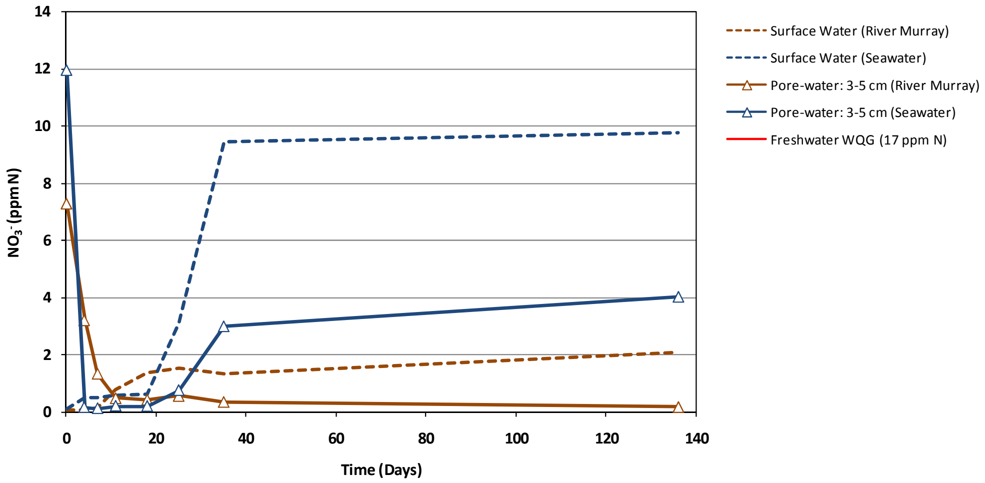

Figure 5-111. Nitrate (NO_3^-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. all values below the freshwater WQG trigger value).

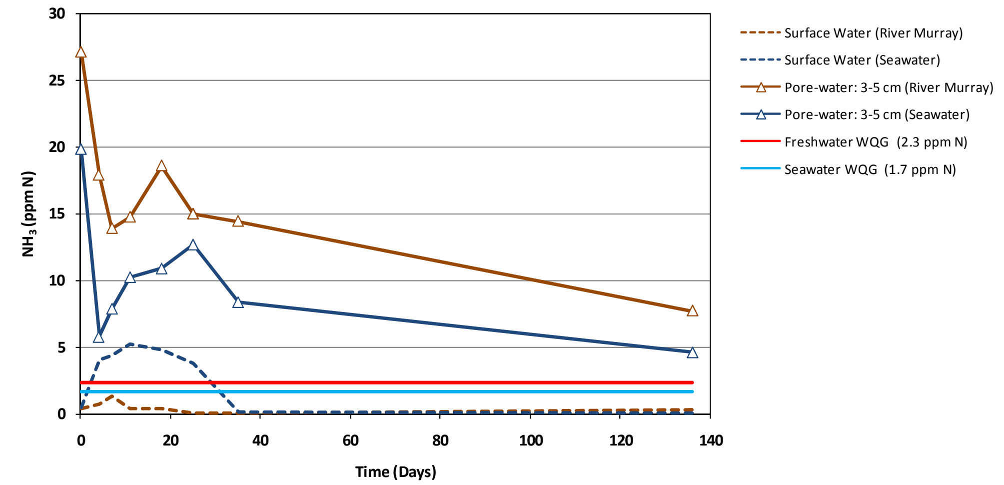

Figure 5-112. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

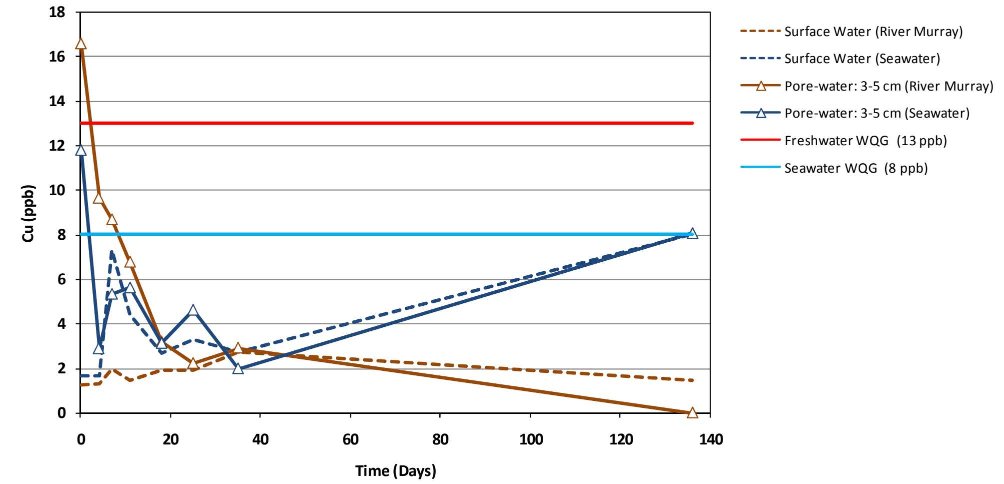

Figure 5-113. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

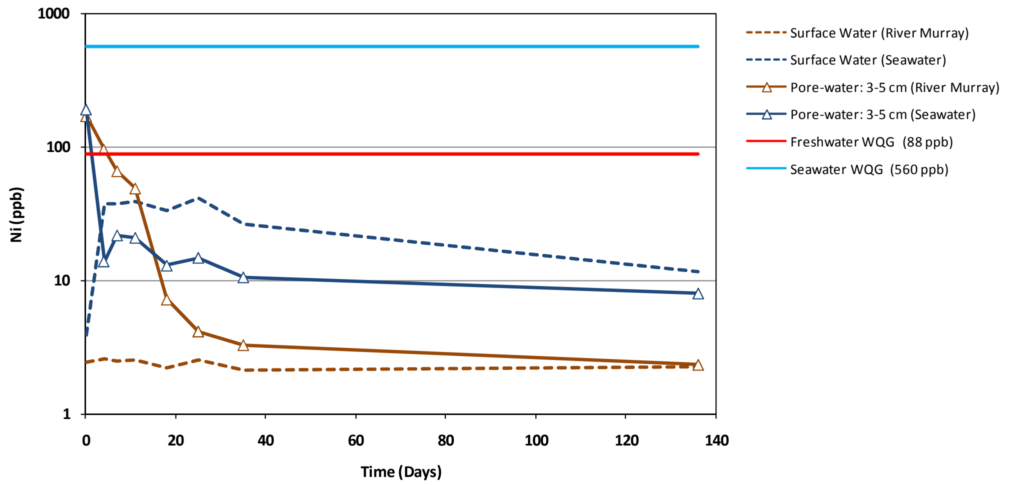

Figure 5-114. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

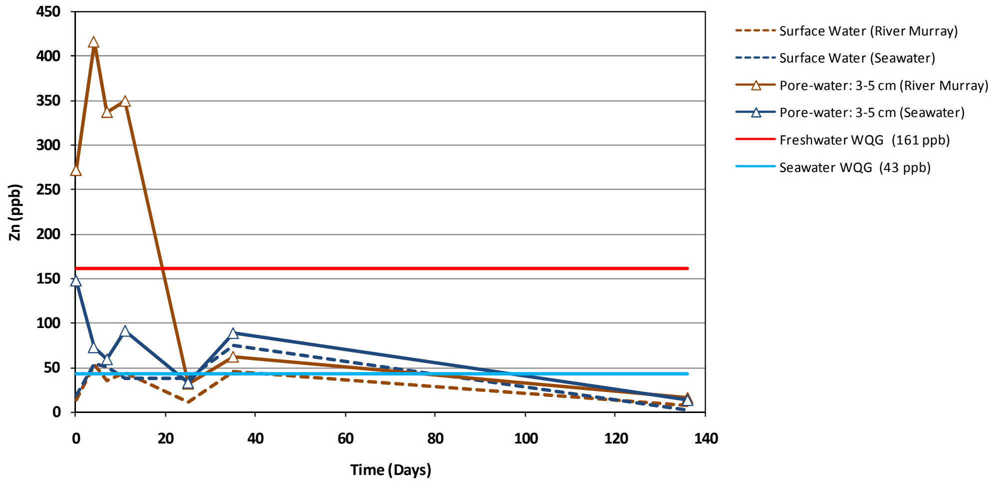

Figure 5-115. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

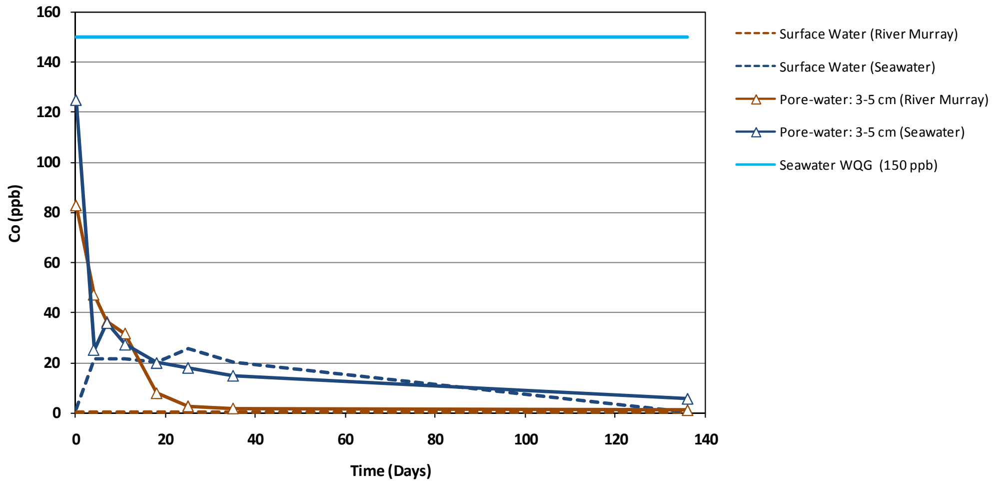

Figure 5-116. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

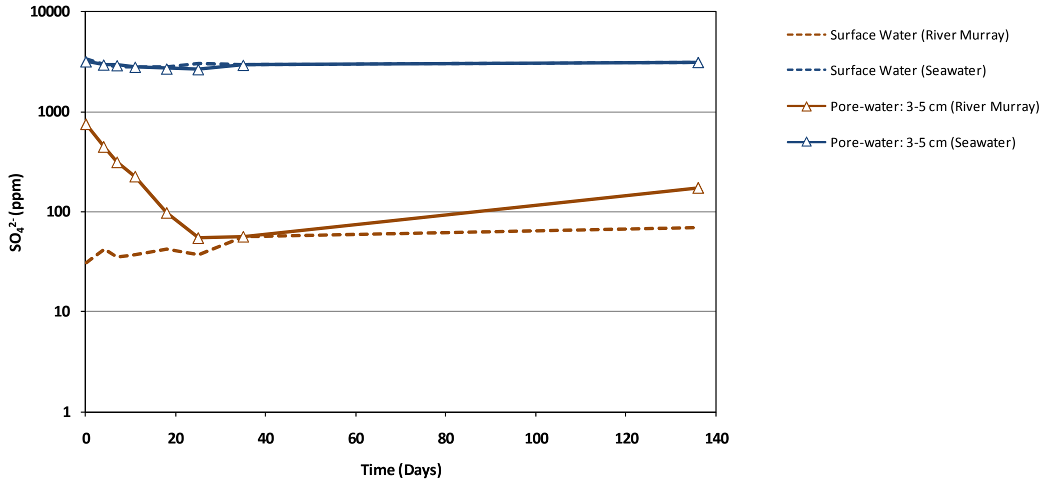

Figure 5-117. Sulfate (SO_4^{2-}) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

5.3.10.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale are the elevated concentrations of NH_3, Cu and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of NH_3, Cu, Mn, Ni, Pb and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as in this study) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.10.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This salinity caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the type of inundating water (i.e. River Murray water or seawater) affected only minimally the pH of the inundating waters during the experimental timescale. Mobilisation of Ni, Cu, As and NH_3 into the inundating waters were stronger when seawater was used.

5.3.11 Inundation of the Milang soil material (Site 11)

5.3.11.1 Sediment characteristics

The sediment characteristics of the Milang soil material (Site 11) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-217 – 9-236).

5.3.11.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Milang soil material (Site 11) with both River Murray water and seawater are given in Appendix 4 (Tables 9-617 – 9-646).

5.3.11.3 Discussion of results of inundation

5.3.11.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-217 – 9-236)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a beige sand layer 0-6 cm thick with a pH of 6.7, underlain by a beige sand layer 6 cm thick with a pH of 6.0, with the remaining 3 cm consisting of a light grey and dark grey banded sand layer with a pH of 3.7.
- Sulfides were at very low levels in the soil materials prior to inundation and had accumulated as a result of sulfate reduction during the 136 days of inundation with both seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. <1.3 mol H^+/tonne) as would be expected given the neutral pH of this soil material.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality - the main apparent changes to the solid phase observed during this relatively short inundation were:
    - An increase in the total and HCl-extractable Fe content of the surface layers.

5.3.11.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-617 – 9-646) show the following main findings:

- The inundation of this soil material by River Murray water induced a general slow increase in the pH of the inundating waters during the 136 days of inundation from a pH of ~6.8 at 2 hours to ~7.9 by day 136 (Figure 5-118).
- The inundation of this soil material by seawater induced an immediate reduction in the pH of the inundating water down to ~6.3 after 2 hours, after which the pH slowly increased to ~7.7 by day 136 (Figure 5-118).
- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the inundating waters decreased to a similar extent.
- The alkalinity in the inundating waters remained relatively constant during the inundation but the alkalinity of the pore-waters gradually increased with duration of inundation especially under River Murray water (Figure 5-119).
- Iron mobilisation was strong during the inundation in the lowermost pore-waters but was not clearly observable in the inundating waters (Figure 5-120).

- NO_3^- concentrations increased considerably during the inundation period especially in the inundating seawaters. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-121).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 11 days for the seawater, respectively). The NH_3 concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-122). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-787, Appendix 6).

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (Figures 5-123 – 5-126).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-127).

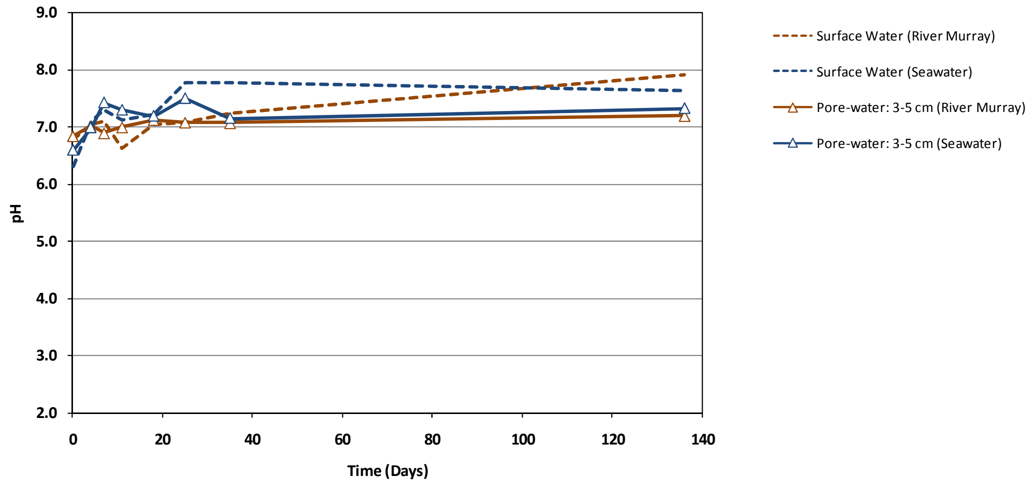

Figure 5-118. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

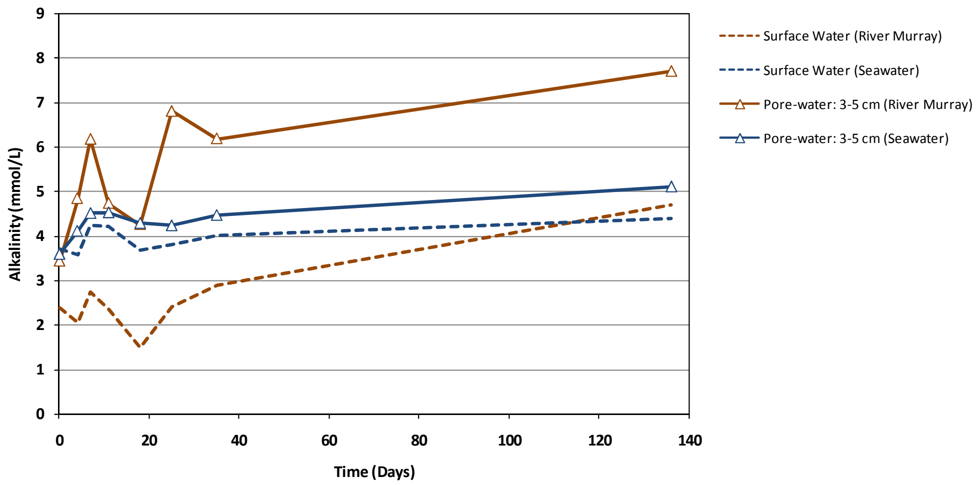

Figure 5-119. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

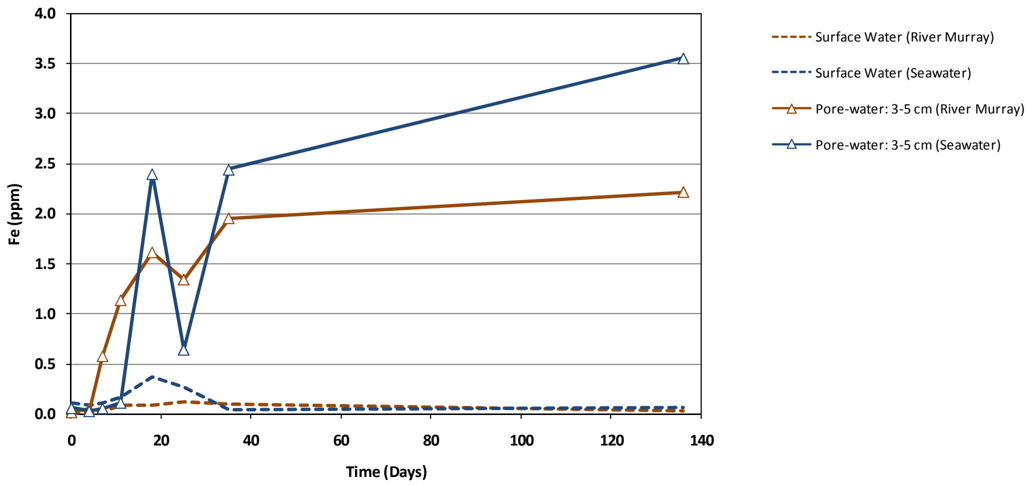

Figure 5-120. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

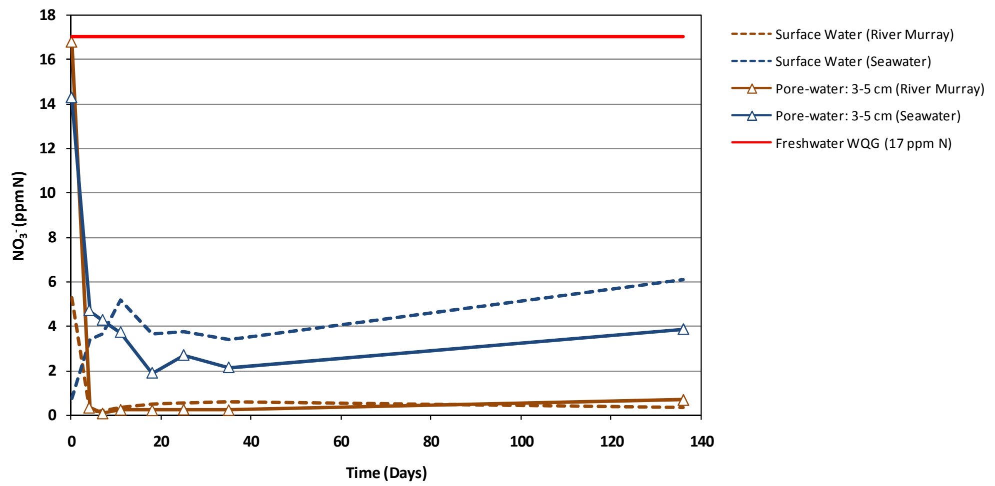

Figure 5-121. Nitrate (NO_3^-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

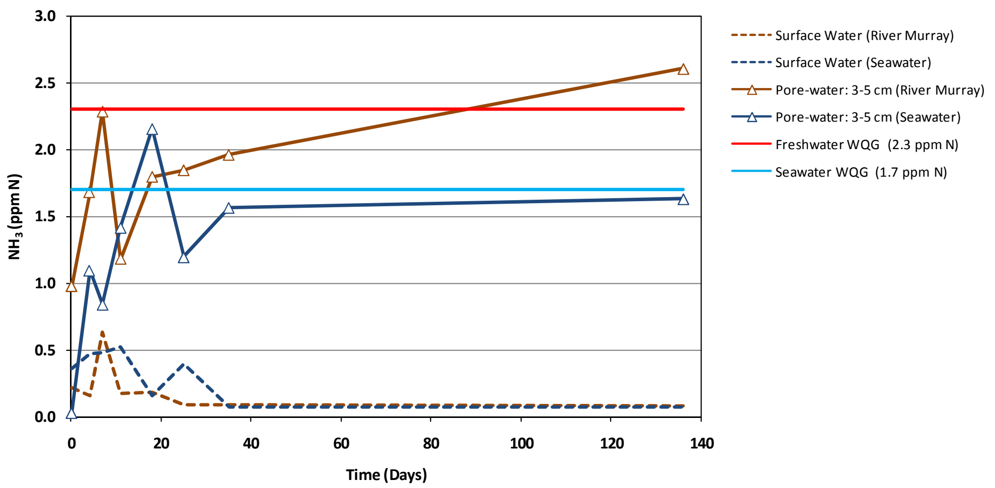

Figure 5-122. Ammonia (NH_3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

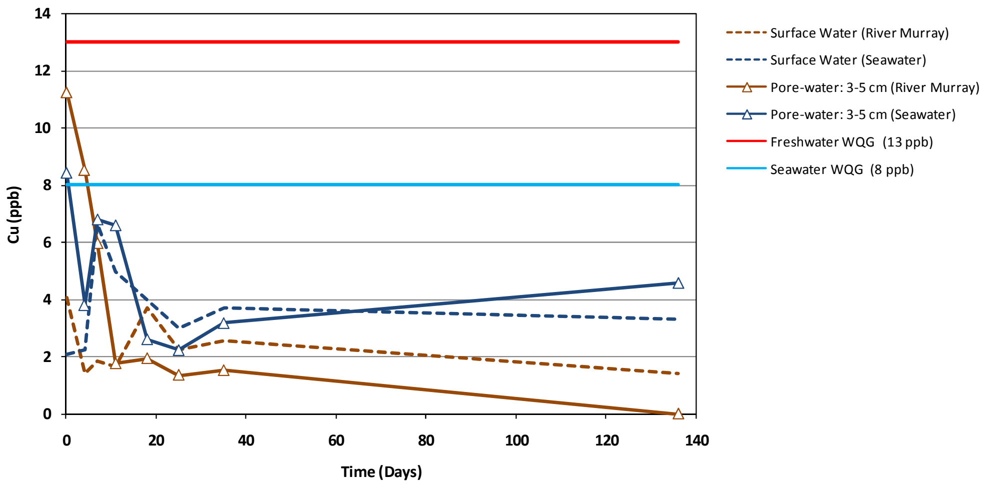

Figure 5-123. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted).

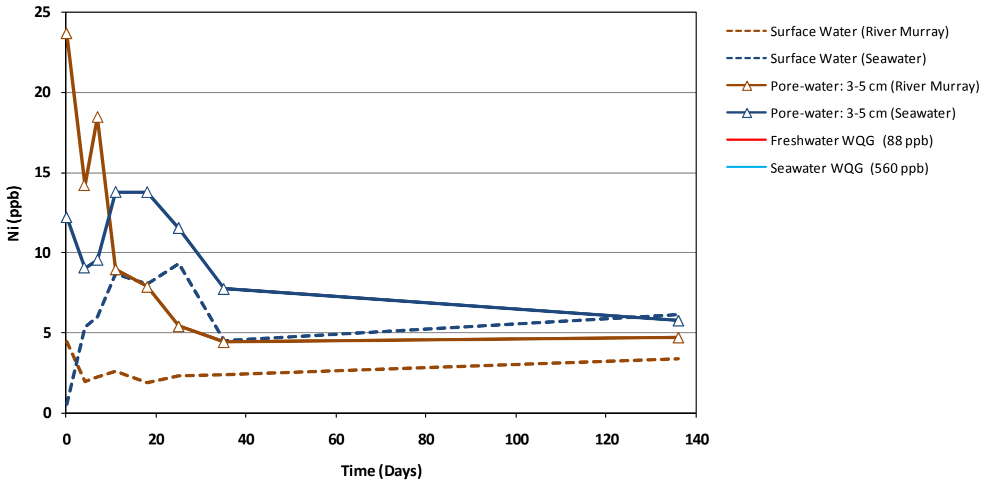

Figure 5-124. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

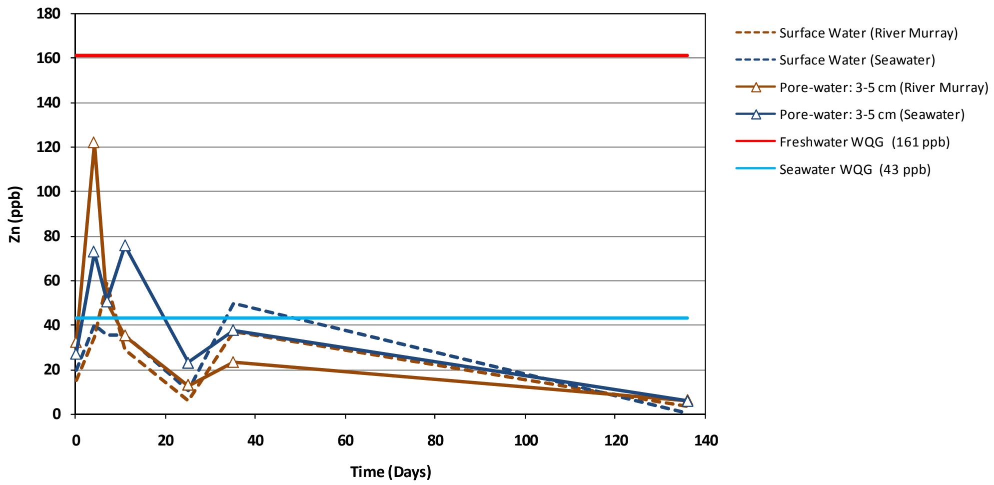

Figure 5-125. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted).

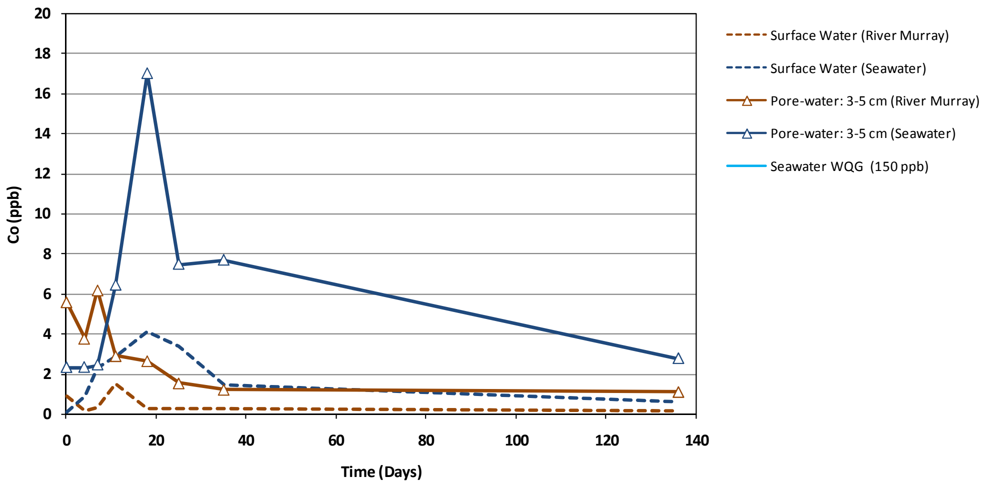

Figure 5-126. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

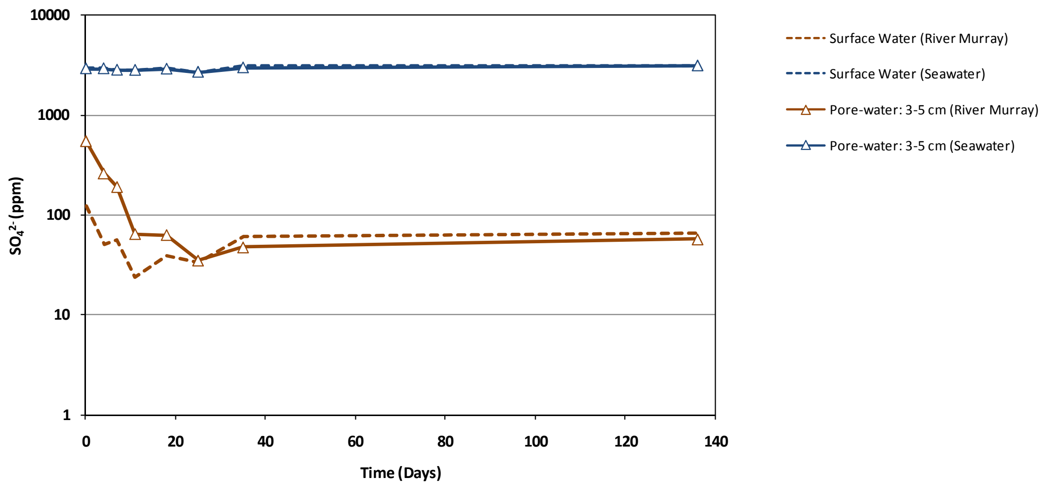

Figure 5-127. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

5.3.11.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of NH_3, Cu, Mn and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as in these experiments) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.11.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the type of inundating water (i.e. River Murray water or seawater) affected only minimally the pH of the inundating waters during the experimental timescale. Mobilisation of Ni, NO_3 and Cd into the inundating waters were stronger when seawater was used.

5.3.12 Inundation of the Ewe Island Barrage soil material (Site 12)

5.3.12.1 Sediment characteristics

The sediment characteristics of the Ewe Island Barrage soil material (Site 12) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-237 – 9-256).

5.3.12.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Ewe Island Barrage soil material (Site 12) with both River Murray water and seawater are given in Appendix 4 (Tables 9-647 – 9-676).

5.3.12.3 Discussion of results of inundation

5.3.12.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-237 – 9-256)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a thin crust with an olive green colour with a pH of 8.2, underlain by a dark grey MBO accumulation 1.5 cm thick layer with a pH of 8.4, underlain by a grey sand layer 8 cm thick with a pH of 8.5, underlain by a beige sand layer 6 cm thick with a pH of 6.0, with the remaining 3 cm consisting of a grey sand layer with a pH of 8.6.
- Sulfides were at low levels in the soil materials prior to inundation and had accumulated appreciably during the 136 days of inundation with either seawater or River Murray water.
- Titratable Actual Acidity (TAA) were negligible (i.e. <0 mol H^+/tonne) as would be expected given the neutral/alkaline pH of this soil material.
- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.
- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality - the main apparent changes to the solid phase observed during this relatively short inundation were:
  - An increase in the HCl-extractable Fe content of the surface layers.

5.3.12.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-647 – 9-676) show the following main findings:

- Inundation of this soil material by either River Murray water or seawater did not appreciably affect the pH of the inundating waters over the duration of the 35 day inundation period (Figure 5-128).
- The pH of the pore-waters was relatively stable over the 35 days of inundation for both inundation water types (Figure 5-128).
- Alkalinity in both the inundating and pore-waters increased considerably during the 35 days of inundation (Figure 5-129).
- Eh of the inundated sediments and the overlying water decreased considerably and steadily during the inundation.
- Iron mobilisation was negligible in the pore-waters of both treatments (except the lower-most sediment layer for the seawater inundation where there was appreciable iron mobilisation into the pore-water when inundated by seawater) and was observable at very low levels in the inundating waters (Figure 5-130).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-788, Appendix 6).

- NO_3^- concentrations increased considerably after 25 days of inundation when River Murray water was used. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-131).

- NH_3 concentrations increased markedly in the inundation waters to levels well above the appropriate ANZECC trigger values (Figure 5-132). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of many metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but none of the metals exceeded the appropriate ANZECC trigger values (e.g. Figures 5-133 - 5-135).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-136).

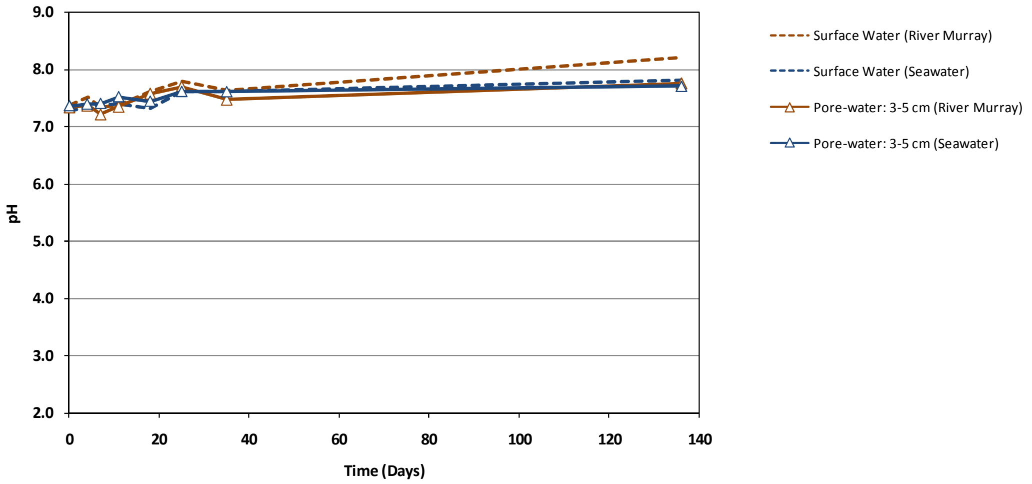

Figure 5-128. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

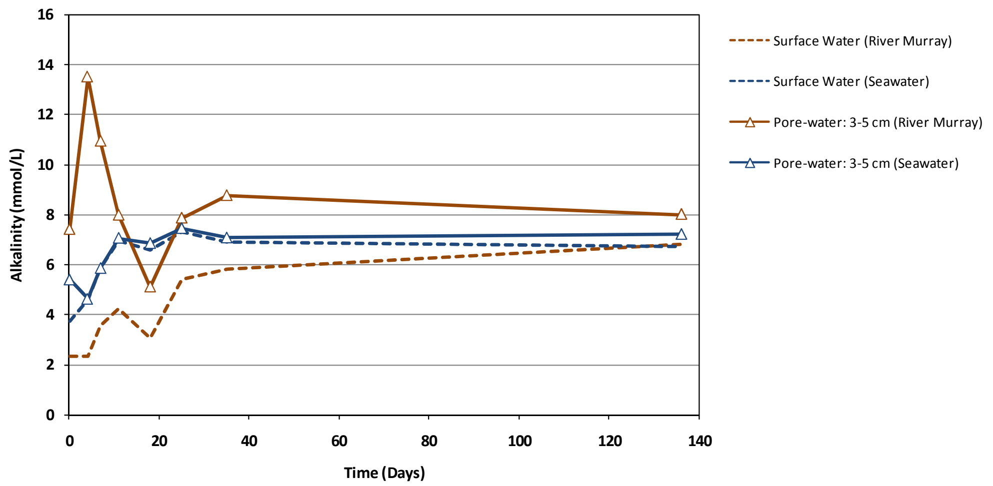

Figure 5-129. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

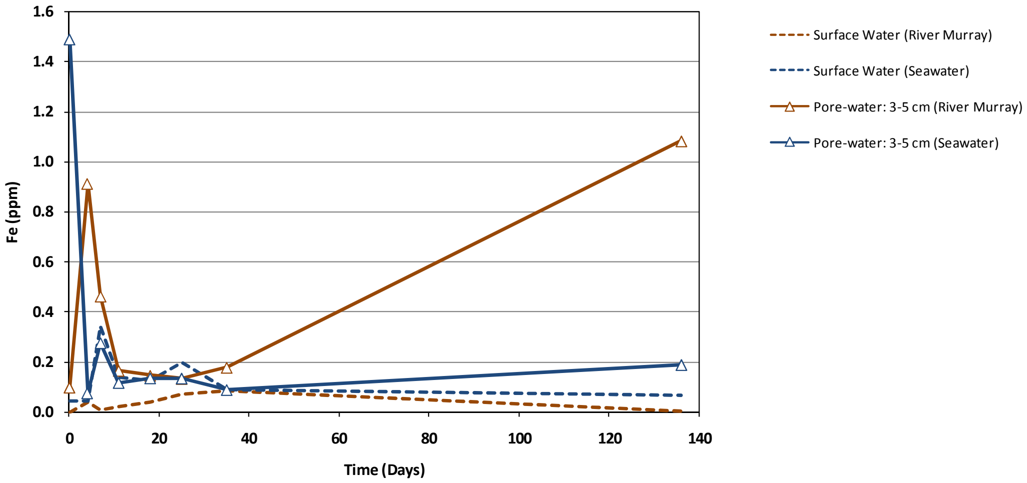

Figure 5-130. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

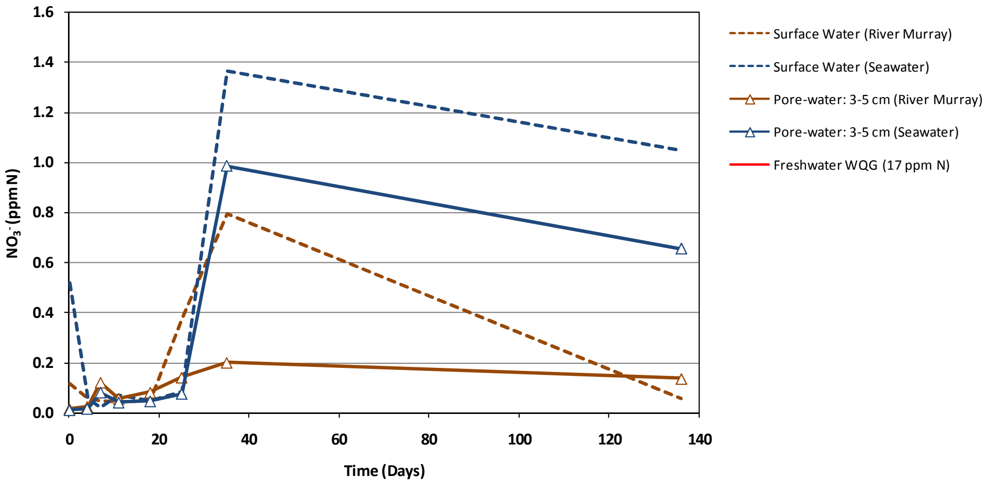

Figure 5-131. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. all values below the freshwater WQG trigger value).

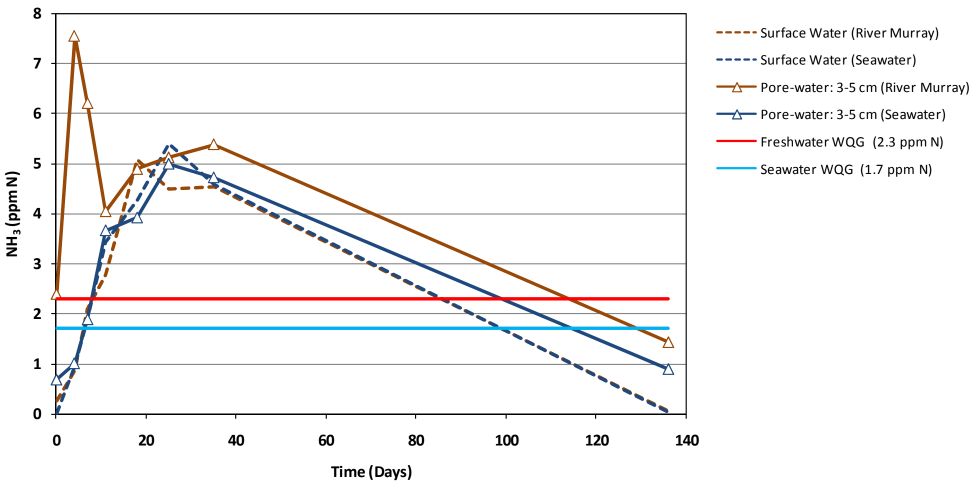

Figure 5-132. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

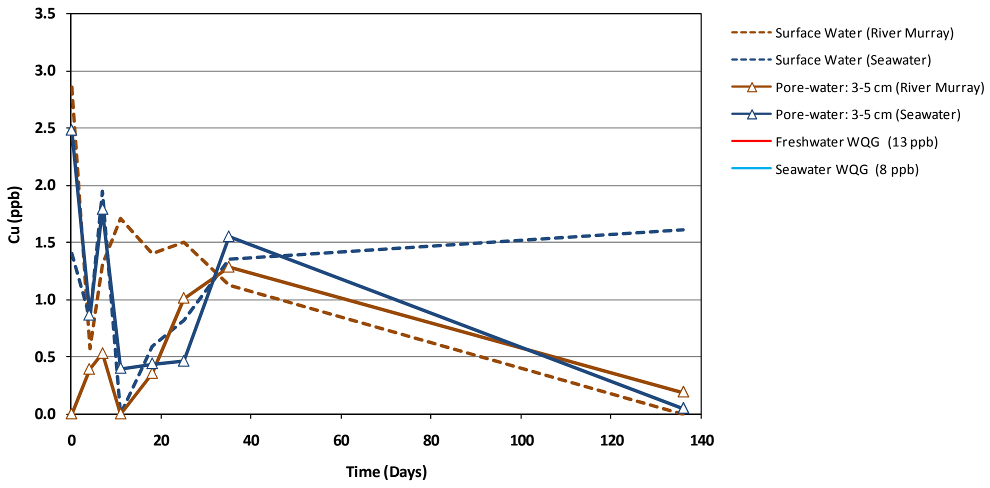

Figure 5-133. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

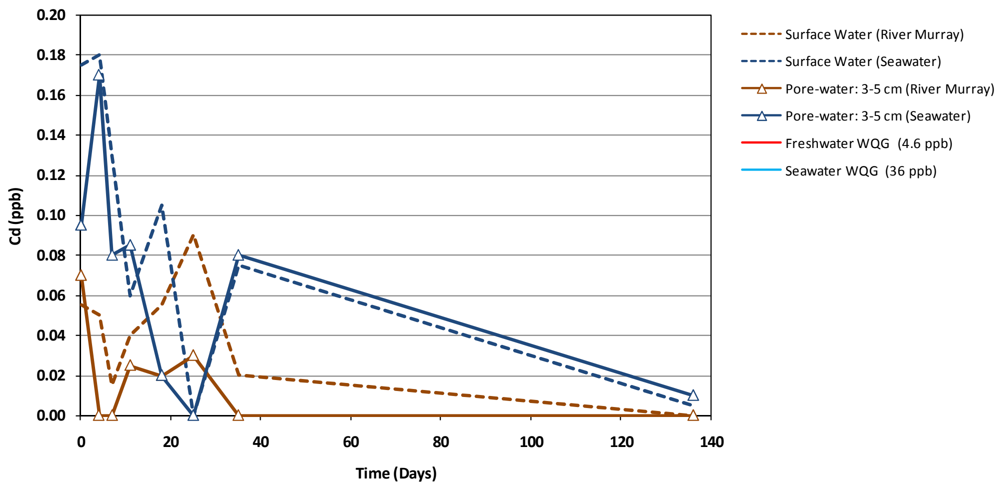

Figure 5-134. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

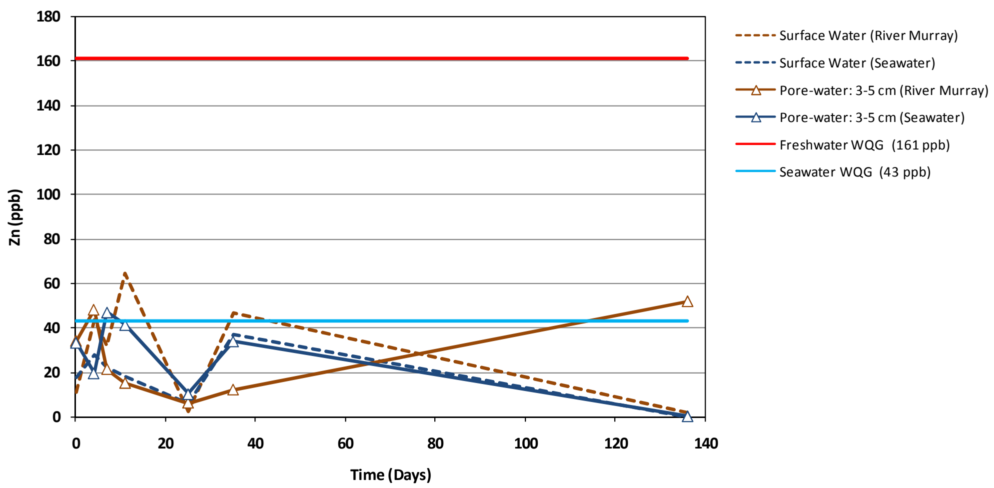

Figure 5-135. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted).

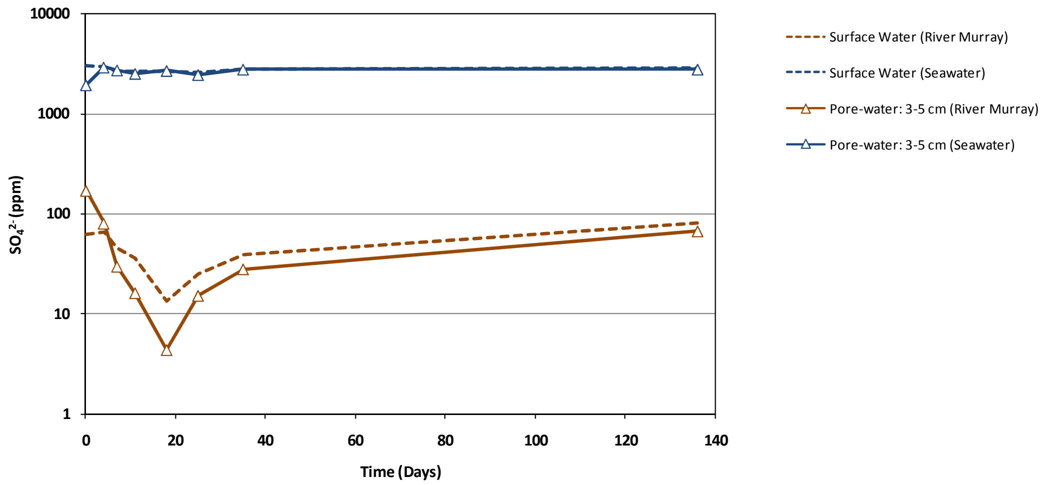

Figure 5-136. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

5.3.12.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality even if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issue identified in this study over this timescale is the elevated concentration of NH_3 in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment) then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Zn and NH_3 to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as done in this experiment) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.12.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the type of inundating water (i.e. River Murray water or seawater) on this sediment made only very minor impacts on the pH and alkalinity of the overlying waters and on the mobilisation of potential contaminants into the inundating waters during the experimental timescale.

5.3.13 Inundation of the Currency Creek soil material (Site 13)

5.3.13.1 Sediment characteristics

The sediment characteristics of the Currency Creek soil material (Site 13) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-257 – 9-276).

5.3.13.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Currency Creek soil material (Site 13) with both River Murray water and seawater are given in Appendix 4 (Tables 9-677 – 9-706).

5.3.13.3 Discussion of results of inundation

5.3.13.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-257 – 9-276)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a 0-5 cm thick dark grey sand with a pH of 3.0, underlain by a light grey sandy layer 4 cm thick with a pH of 8.4 and containing abundant jarosite mottles, with the remaining 6 cm consisting of a grey light clay layer with a pH of 3.2 and containing abundant jarosite accumulations around fine (~1 mm diameter) root holes.

- Sulfides were at very low levels in the soil materials prior to inundation and accumulated slightly in the lower-most sediment layer during the 136 days of inundation with both seawater and River Murray water.

- Titratable Actual Acidity (TAA) were appreciable in the lower soil layer (i.e. 56 mol H^+/tonne) as would be expected given the highly acidic nature of this soil material (i.e. pH ~2.4). The TAAs decreased with duration of inundation by both seawater and River Murray water.

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase during the inundation.

5.3.13.3.2 Surface and pore-water results

The surface water and pore-water results Appendix 4 (i.e. Tables 9-677 – 9-706) show the following main findings:

- The inundation of this soil material by both seawater and River Murray water had a slowly acidifying effect on the inundating waters. The starting pH of both inundating waters was ~7.0 after 2 hours of inundation but after 136 days of inundation was ~ 3.5 for both inundating waters (Figure 5-137).

- Acidification was initially more severe when the inundating waters were seawater rather than River Murray water (Figure 5-137).

- Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the inundating waters was relatively constant over the duration of the inundation.

- The alkalinity in the inundating waters was reduced to nil after 136 days of inundation. The alkalinity of the pore-waters was extremely low throughout the duration of inundation (Figure 5-138).
- Iron mobilisation in the pore waters was very strong, especially in the lowermost pore-waters, during the inundation but was only very slight in the inundating waters. (Figure 5-139).

- NO_3^- concentrations increased considerably during the inundation period when River Murray water was used. However, the NO_3^- concentrations – which peaked at 35 days inundation - were lower than the ANZECC trigger value (Figure 5-140).

- NH_3 concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 25 days for the seawater, respectively). The NH_3 concentrations only exceed the appropriate ANZECC trigger values for the day 136 inundation when seawater was used (Figure 5-141). The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-789, Appendix 6).

- The concentrations of some of the metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentrations of Cu and Zn (seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-142 – 5-146).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-147).

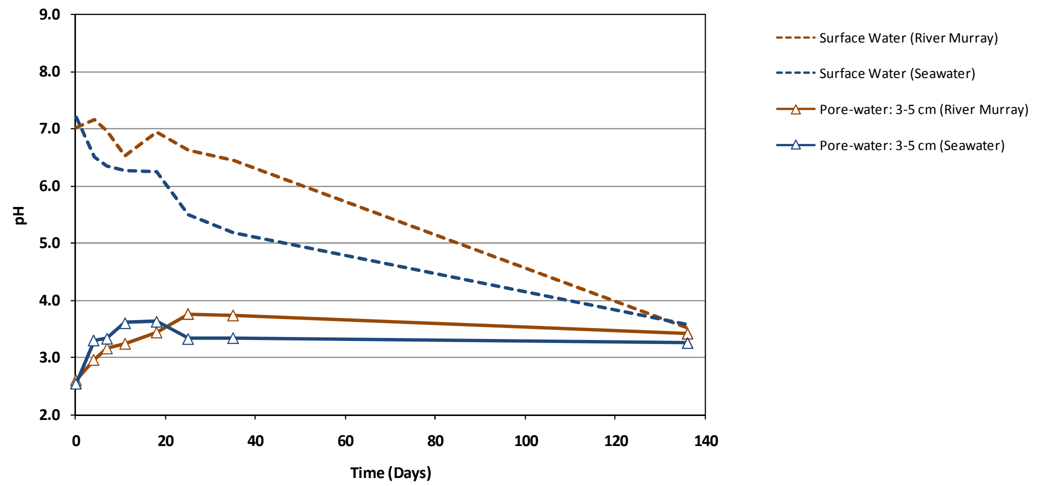

Figure 5-137. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

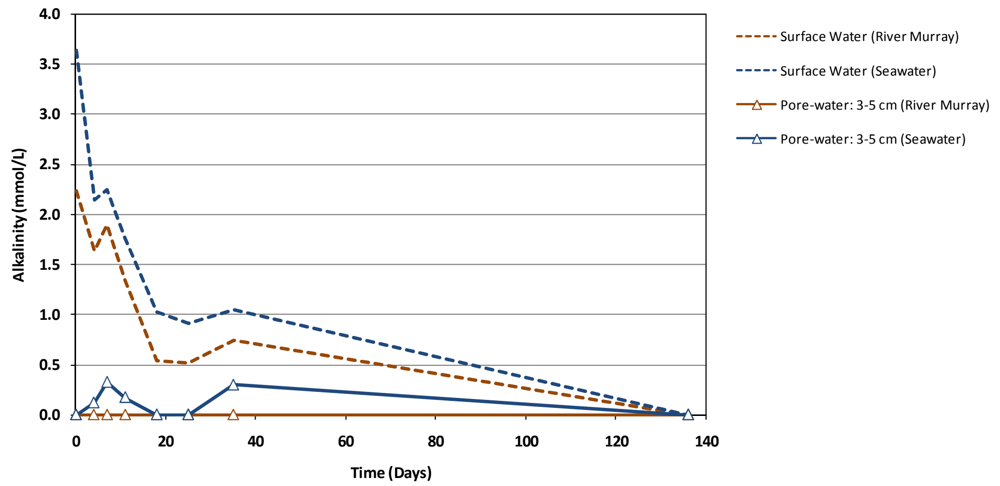

Figure 5-138. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

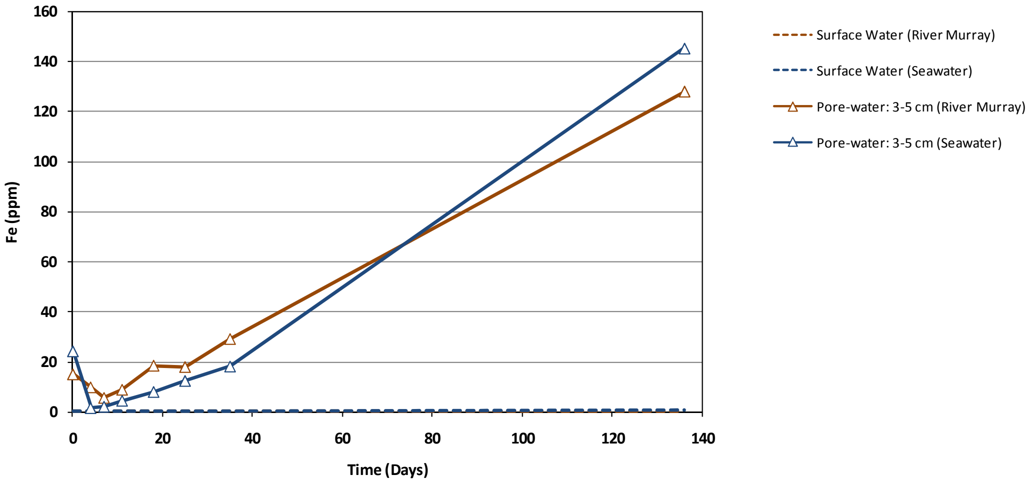

Figure 5-139. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

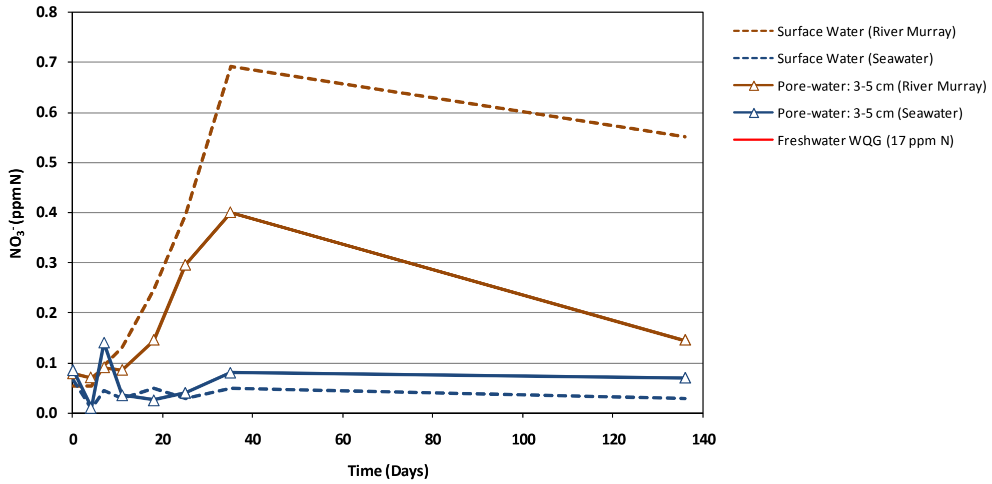

Figure 5-140. Nitrate (NO3-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. all values below the freshwater WQG trigger value).

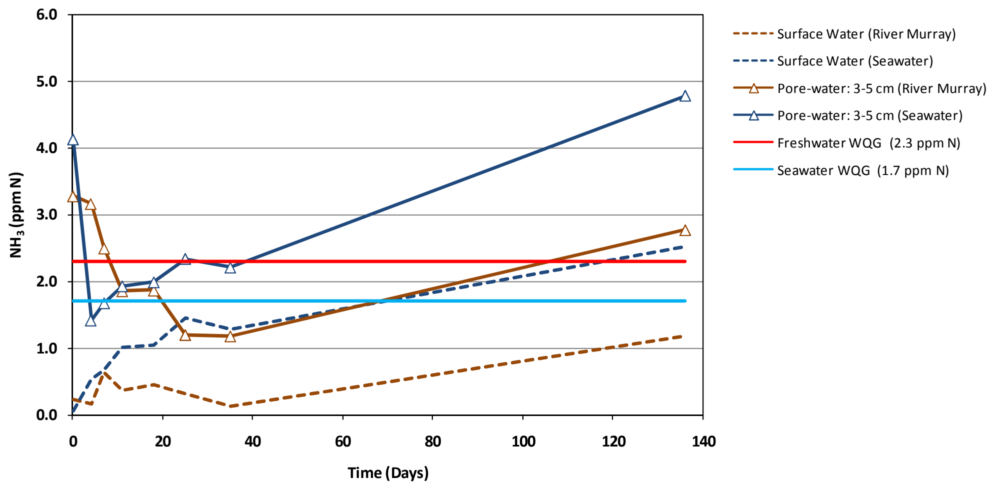

Figure 5-141. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

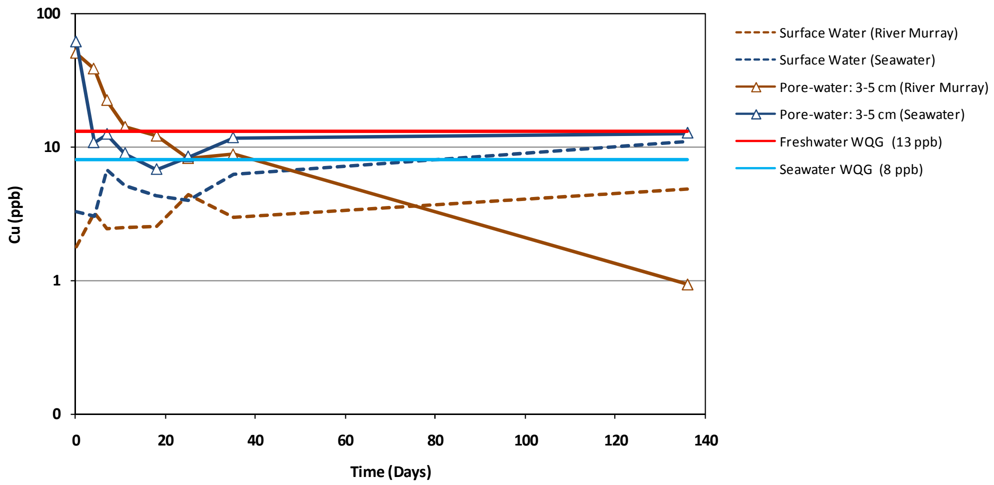

Figure 5-142. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted).

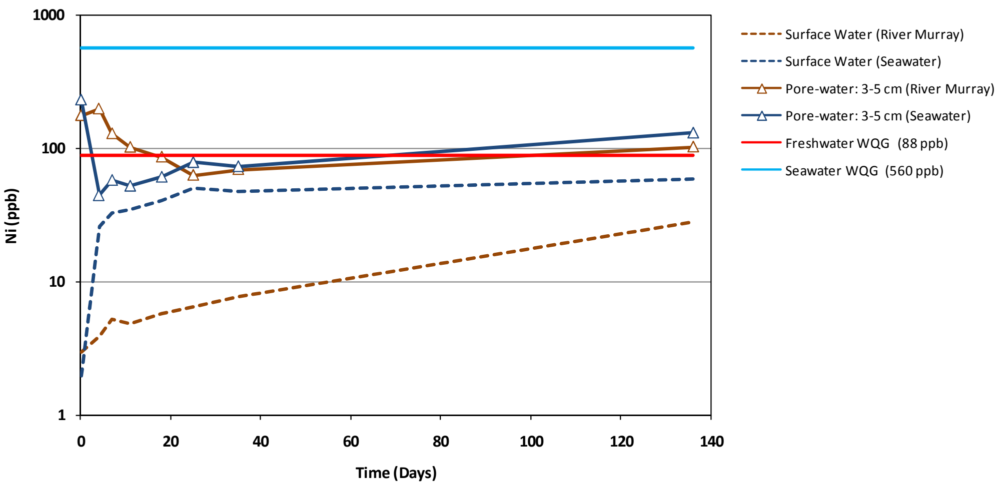

Figure 5-143. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted).

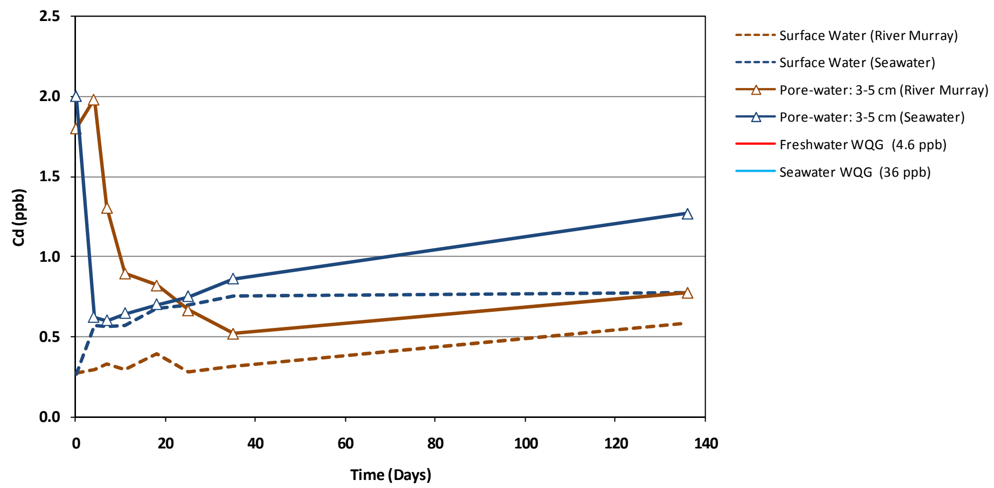

Figure 5-144. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13. (n.b. all values below the WQG trigger values).

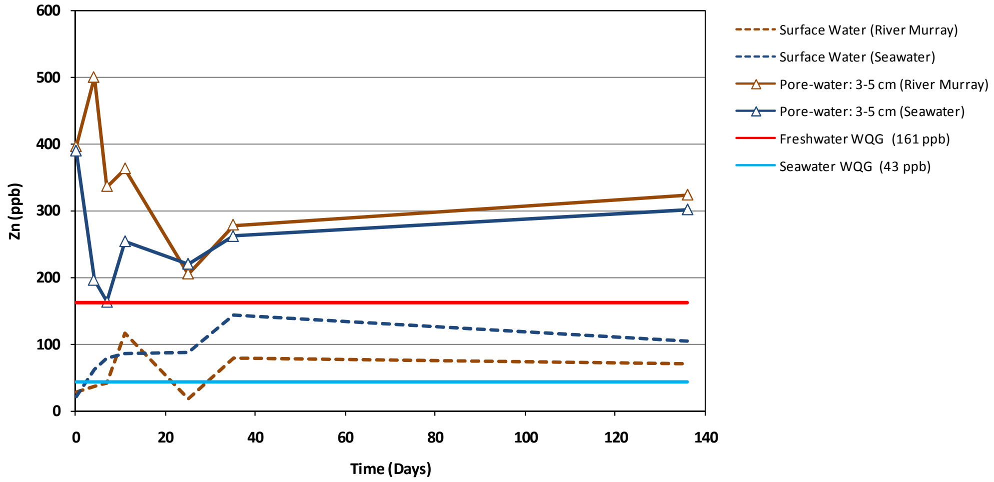

Figure 5-145. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

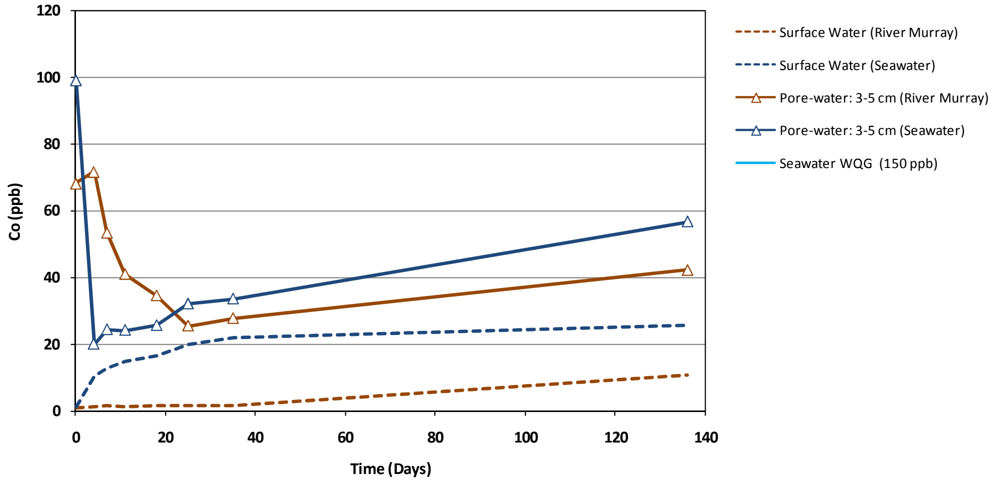

Figure 5-146. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

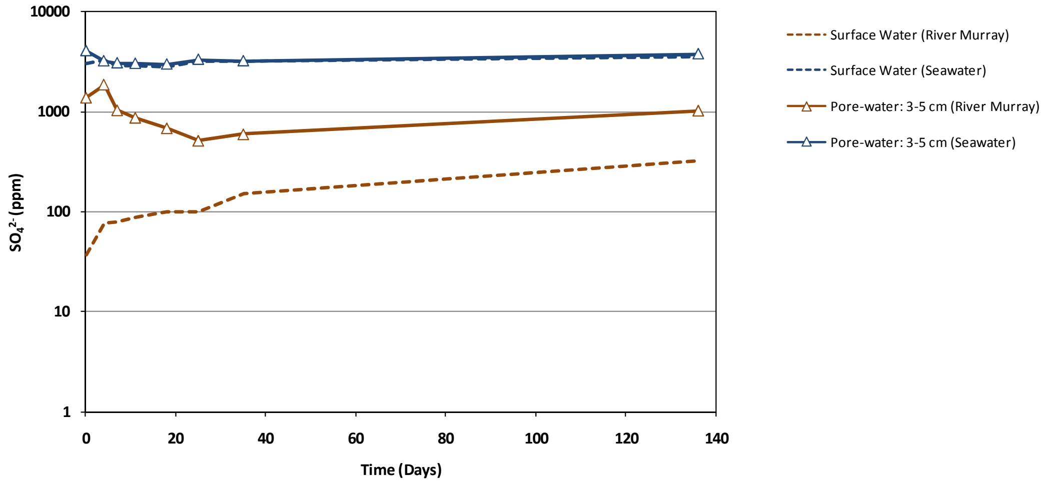

Figure 5-147. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

5.3.13.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale are acidification of the overlying waters and the elevated concentration of NH_3, Cu and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of NH_3, Cu, Mn, Ni, Cd, Co, Cr and Zn to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as was undertaken in this experiment) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.13.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This salinity caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. In comparison the uppermost pore-waters in these sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the type of inundating water (i.e. River Murray water or seawater) strongly affected the initial pH of the inundating waters, however this effect diminished by day 136 days of inundation. Acidification occurred more rapidly and more severely when seawater was used. Mobilisation of NH_3, Ni, Cu, As and Cd into the inundating waters were stronger when seawater was used.

5.3.14 Inundation of the Poltalloch Station soil material (Site 14)

5.3.14.1 Sediment characteristics

The sediment characteristics of the Poltalloch Station soil material (Site 14) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-277 – 9-296).

5.3.14.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Poltalloch Station soil material (Site 14) with both River Murray water and seawater are given in Appendix 4 (Tables 9-707 – 9-736).

5.3.14.3 Discussion of results of inundation

5.3.14.3.1 Soil material results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-277 – 9-296)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a 0-6 cm thick beige sandy layer with a pH of 3.6, underlain by a slightly darker beige sandy layer 8 cm thick with a pH of 3.3, with the remaining 1 cm thick layer consisting of a dark beige sandy layer with a pH of 3.1 and containing abundant jarosite mottles.

- Sulfides were at very low levels in the soil materials prior to inundation and had accumulated appreciably during the 136 days of inundation with both seawater or River Murray water.

- Titratable Actual Acidity (TAA) were appreciable (i.e. up to 19 mol H^+/tonne) just over the action trigger for acid sulfate soils. However, in general these TAA values were very low considering the highly acidic nature of this soil material (i.e. pH as low as 2.4). The TAA values decreased during the 136 days of inundation especially with seawater inundation.

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase during the inundation.

5.3.14.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-707 – 9-736) show the following main findings:

- Inundation of this sulfuric soil material by both seawater and River Murray water appreciably acidified the inundating waters over the duration of the 136 day inundation period (Figure 5-148). This effect was more rapid and more pronounced for the seawater treatment where the pH decreased from ~6.6 after 2 hours of inundation to ~ 3.5 after 35 days. For comparison the pH of the River Murray water was ~4.8 after 35 days inundation. In both cases the pH of the inundating waters was ~ 3.0 after 136 days of inundation.

- The pH of the upper sediment pore-waters showed an increasing trend to ~ pH 4.6 after 35 days of inundation and thereafter a decreasing trend to pH 3.9 when inundated by River Murray water and to pH 3.4 when inundated by seawater, after 136 days.

- Alkalinity in both the inundating and pore-waters decreased during the inundation with both waters (Figure 5-149). The alkalinity was most likely consumed by upwards diffusion of acidity from the underlying sediment. The alkalinity of the pore-waters was extremely low but was slightly increasing at the end of the inundation period.
- The Eh of the inundated sediments decreased during the inundation. The Eh of the inundating waters initially paralleled the decrease in Eh observed in the uppermost sediment layer, but increased after 18 days (seawater) or 35 days (River Murray water).

- Iron mobilisation into the pore-waters of both treatments was very strong and was observable at low levels in the inundating waters (Figure 5-150).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-790, Appendix 6).

- NO_3^- concentrations increased markedly in the inundating River Murray water during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO_3^- concentrations were below the ANZECC trigger value (Figure 5-151).

- NH_3 concentrations increased markedly in the inundation waters (especially initially in the inundating seawater). The NH_3 concentrations exceeded the appropriate ANZECC trigger value for seawater at days 7 to 136, and for River Murray water at 136 days only (Figure 5-152). The concentration of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of many metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentration of Cu and Zn exceeded the appropriate ANZECC trigger values (e.g. Figures 5-153 – 5-157).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-158).

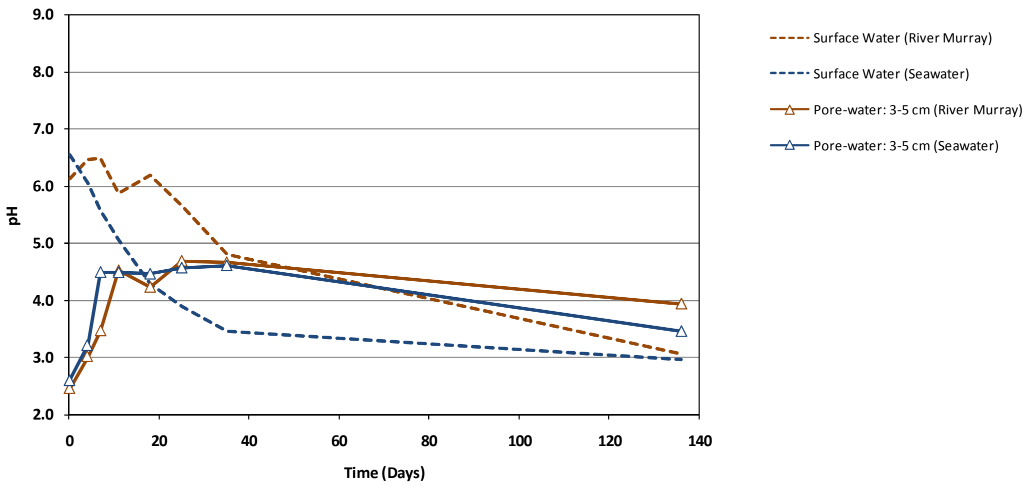

Figure 5-148. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

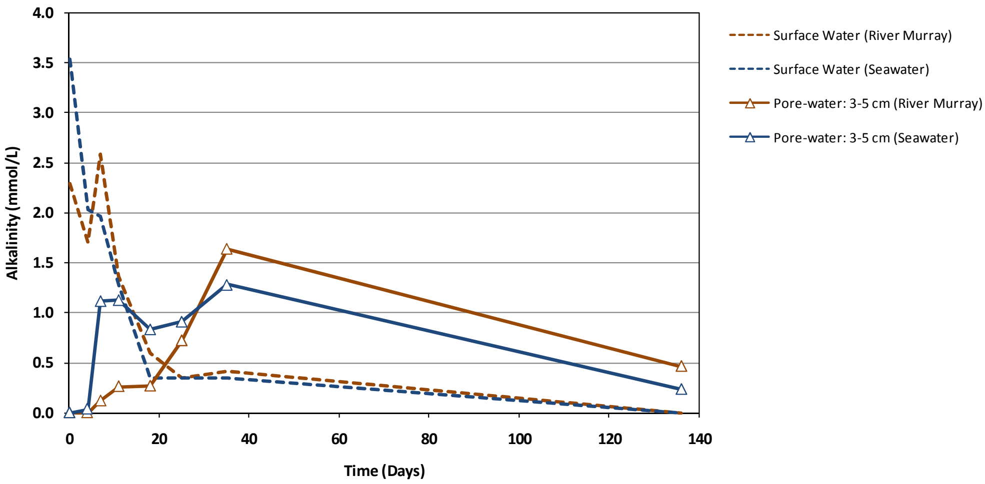

Figure 5-149. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

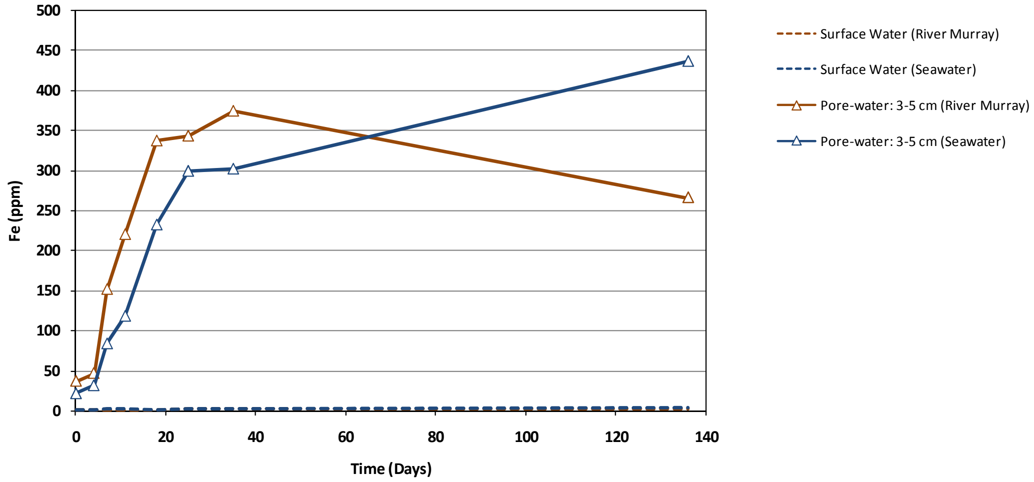

Figure 5-150. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

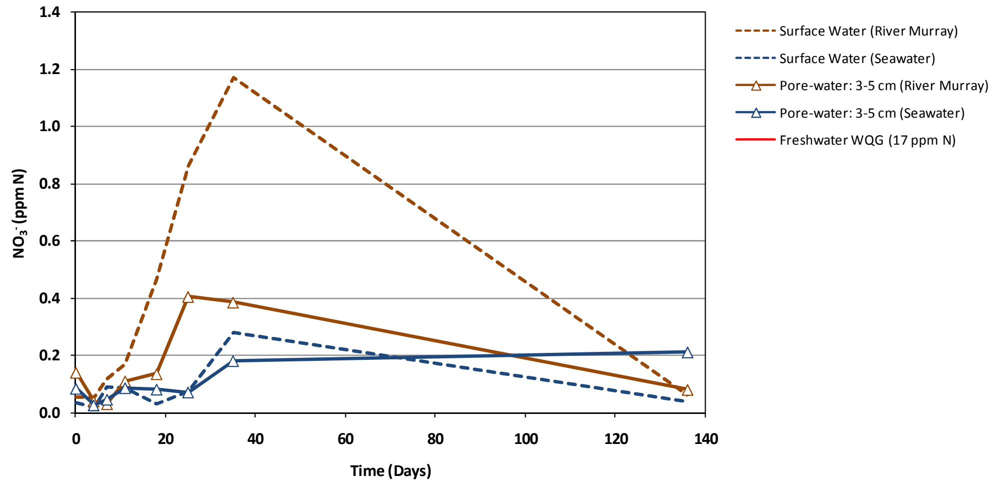

Figure 5-151. Nitrate (NO_3^-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. all values below the freshwater WQG trigger value).

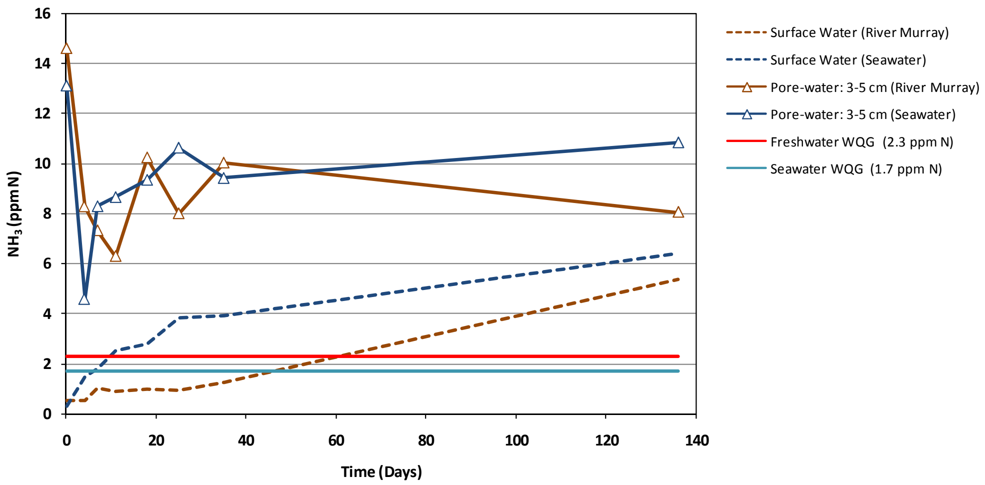

Figure 5-152. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

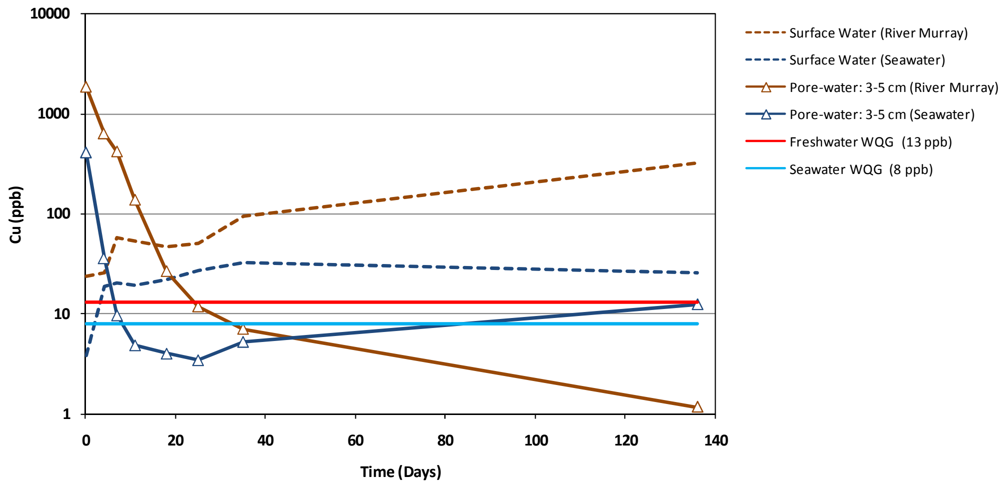

Figure 5-153. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

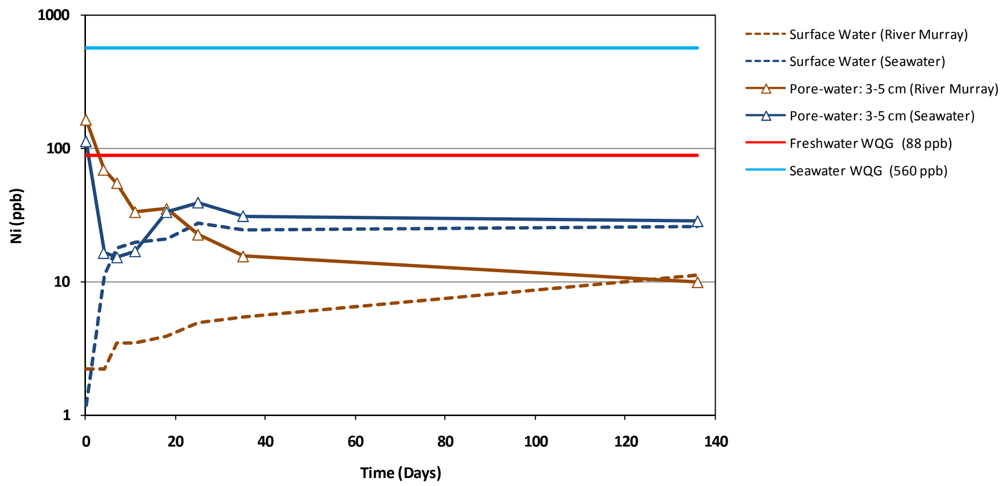

Figure 5-154. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

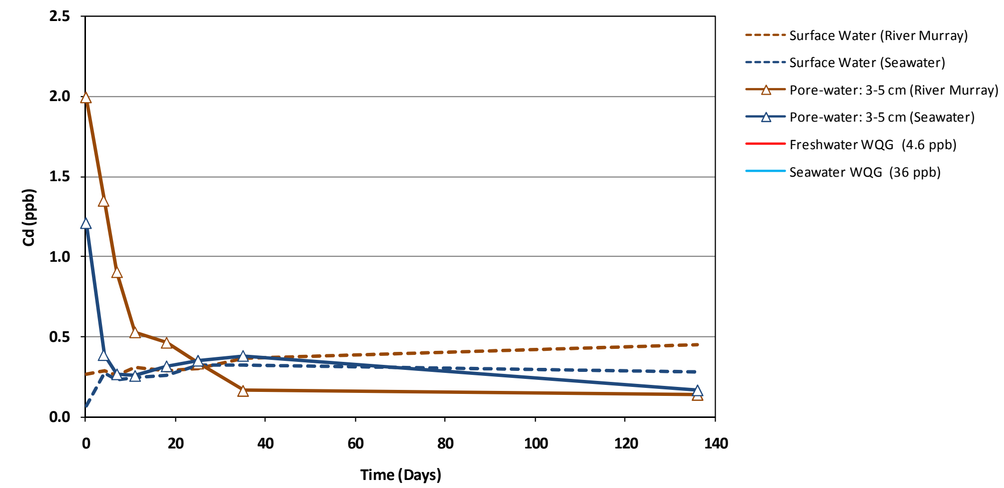

Figure 5-155. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

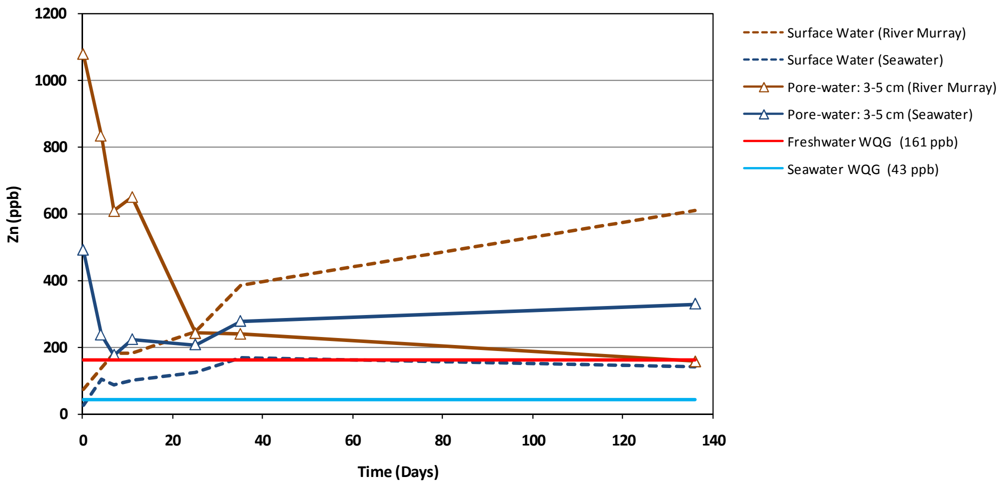

Figure 5-156. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

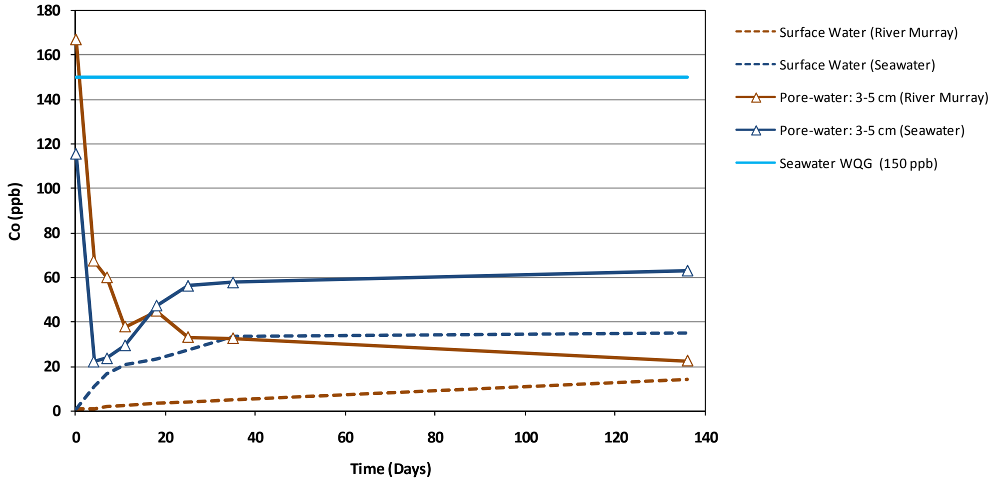

Figure 5-157. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

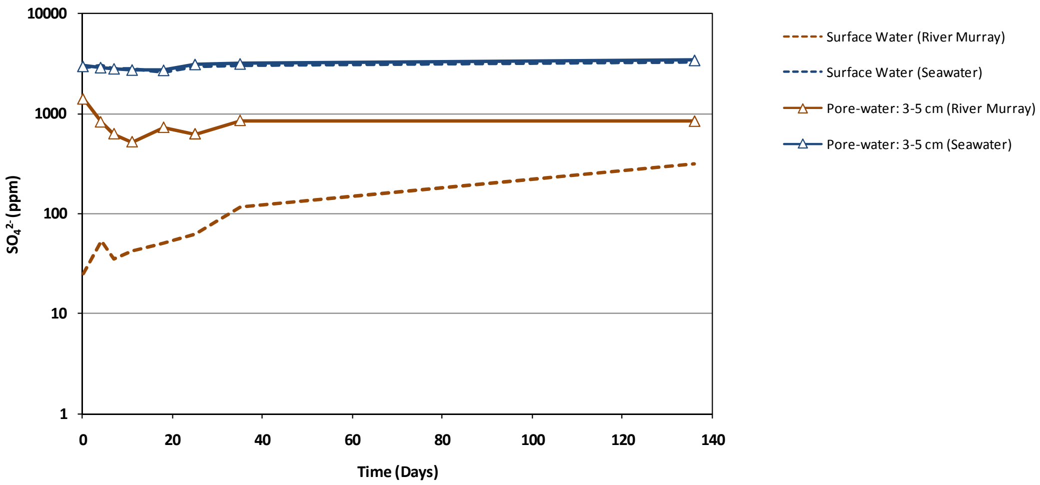

Figure 5-158. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

5.3.14.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale are severe acidification of the overlying waters, the elevated concentrations of Cu, NH_3, and Zn in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment) then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Mn, Cu, Cr, Ni, Co, Pb, Zn and NH_3 to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active after the 136 days of inundation requested for this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as in this experiment) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.14.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. In comparison, the uppermost pore-waters in the sediments were becoming depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, **t**he acidification of the overlying waters was substantial during the 136 day period. The degree and rate of acidification of the inundating waters was initially greater when seawater was used for inundation than when River Murray water was used, but by day 136 of the inundation the pHs of the two inundation waters were similar.

The type of inundating water also had an appreciable impact of the mobilisation of potential contaminants into the inundating waters during the experiment. The rate of mobilisation of Al, Mn, Co and Ni from the sediment into the inundating seawater was higher than that to the inundating River Murray water: however, the reverse was the case for Cu, Mn, NO_3^- and NO_2^-.

5.3.15 Inundation of the Poltalloch Station soil material (Site 15)

5.3.15.1 Sediment characteristics

The sediment characteristics of the Poltalloch Station soil material (Site 15) before and after inundation with both River Murray water and seawater are given in Appendix 3 (Tables 9-297 – 9-316).

5.3.15.2 Surface water and pore-water characteristics

The surface water and pore-water (3-5 cm, 10-12 cm) characteristics following inundation of the Poltalloch Station soil material (Site 15) with both River Murray water and seawater are given in Appendix 4 (Tables 9-737 – 9-766).

5.3.15.3 Discussion of results of inundation

5.3.15.3.1 Soil materials results

The material results (i.e. Appendix 1 (Table 9-1) and Appendix 3 (Tables 9-297 – 9-316)) show the following main findings:

- The uppermost 15 cm of this saline soil material consisted of a 0-6 cm thick beige sandy layer with a pH of 7.0 and abundant orange segregations, underlain by a beige sandy layer 8 cm thick with a pH of 7.0 and very abundant orange segregations, with the remaining 1 cm thick layer consisting of a light grey clay layer with a pH of 7.1.

- Sulfides were at very low levels in the soil materials prior to inundation but had accumulated to low levels during the 136 days of inundation with River Murray water alone.

- Titratable Actual Acidity (TAA) were negligible (i.e. <0 mol H^+/tonne) as would be expected given the neutral/alkaline pH of this soil material.

- None of the solid phase properties measured exceeded the relevant sediment quality guideline triggers.

- Apart from changes in salinity-related properties - these are discussed in the section that deals with water quality – there were no major apparent changes to the solid phase during the inundation.

5.3.15.3.2 Surface and pore-water results

The surface water and pore-water results in Appendix 4 (i.e. Tables 9-737 – 9-766) show the following main findings:

- Inundation of this soil material by River Murray water did not appreciably affect the pH of the inundating waters over the duration of the 136 day inundation period (Figure 5-159).

- The pH of the pore-waters was relatively stable over the 136 days of inundation for both inundation water types (Figure 5-159).

- Alkalinity in both the inundating and pore-waters remained relatively constant during the inundation, excepting that the alkalinity of the lower-most pore waters increased strongly after day 18 of inundation when inundated by River Murray water (Figure 5-160).

- The Eh of the inundated sediments and the overlying water decreased considerably and steadily during the inundation.

- Iron mobilisation was slight in the pore-waters of both treatments and was observable at only very low levels in the inundating waters (presumably due to oxidation and precipitation of any upwards diffusing Fe(II) in those overlying waters) (Figure 5-161).

- The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested (Table 9-791, Appendix 6).

- NH_3 concentrations increased markedly in the inundation waters to levels below the appropriate ANZECC trigger values (Figure 5-162). This effect was greater during inundation with seawater. The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.

- The concentrations of many metals in the inundation waters (and especially the pore-waters) increased during the period of inundation but only the concentrations of Cu and Zn (both seawater inundation only) exceeded the appropriate ANZECC trigger value (e.g. Figures 5-163 - 5-167).

- There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water (Figure 5-168).

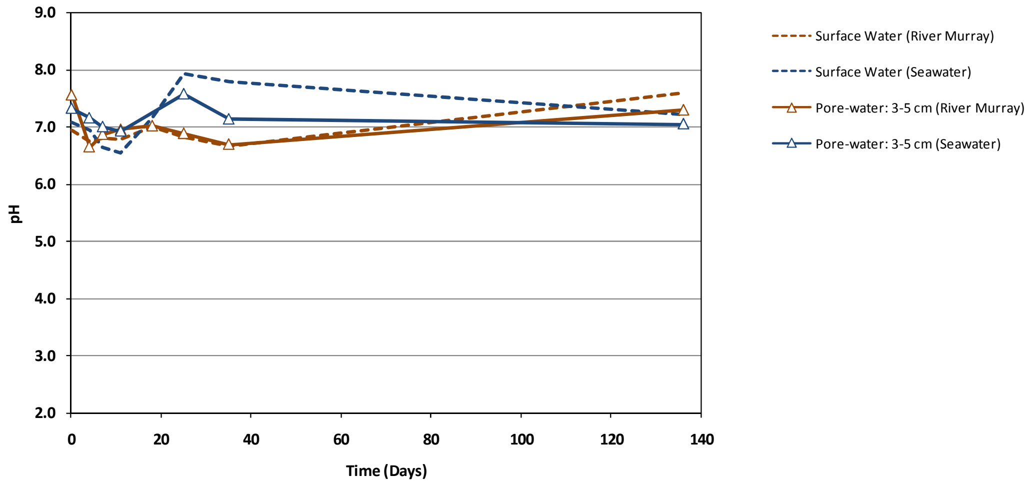

Figure 5-159. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

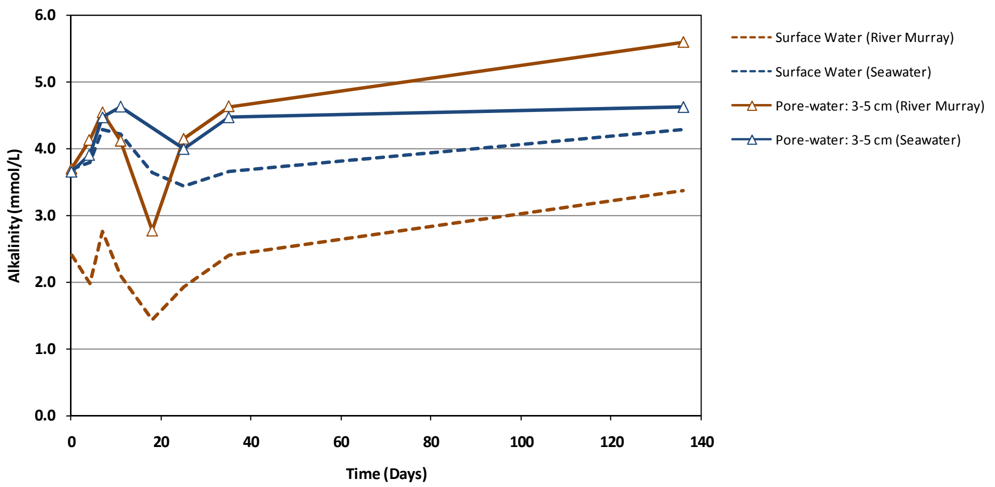

Figure 5-160. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

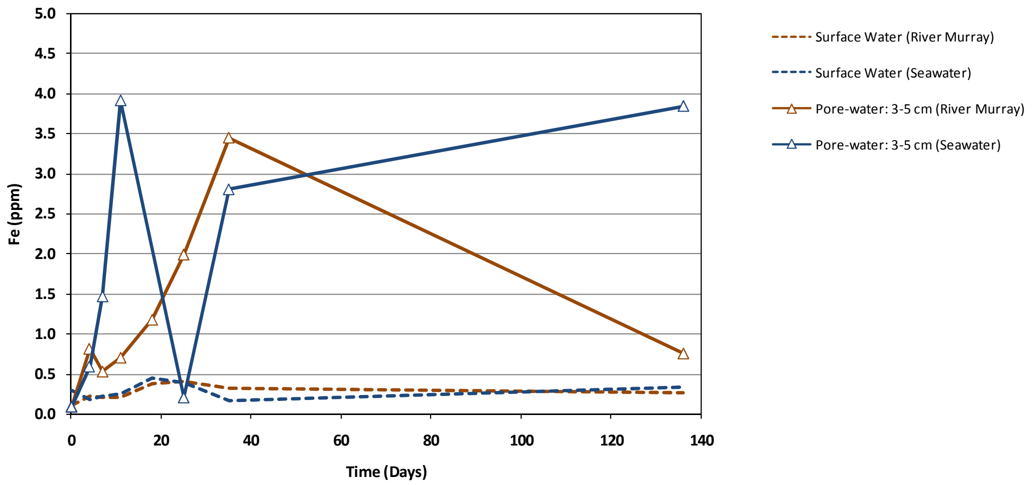

Figure 5-161. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

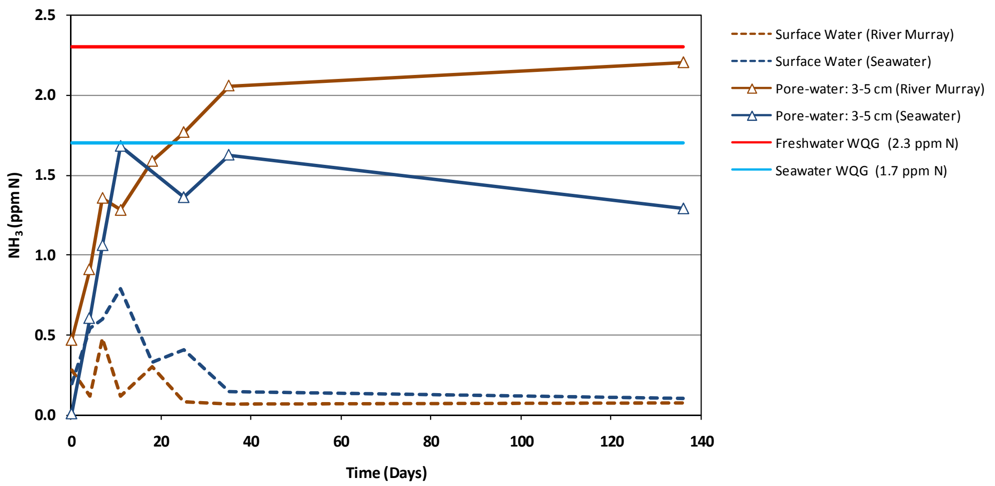

Figure 5-162. Ammonia (NH3) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

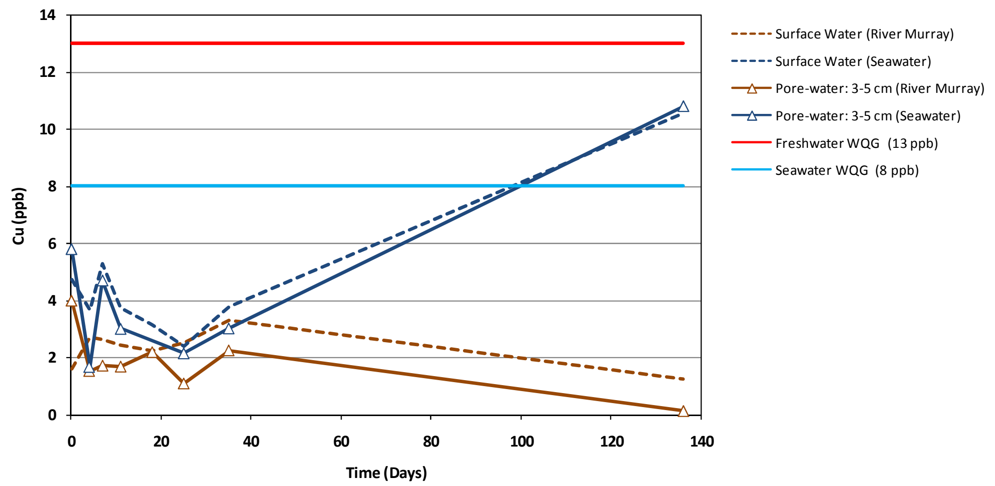

Figure 5-163. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

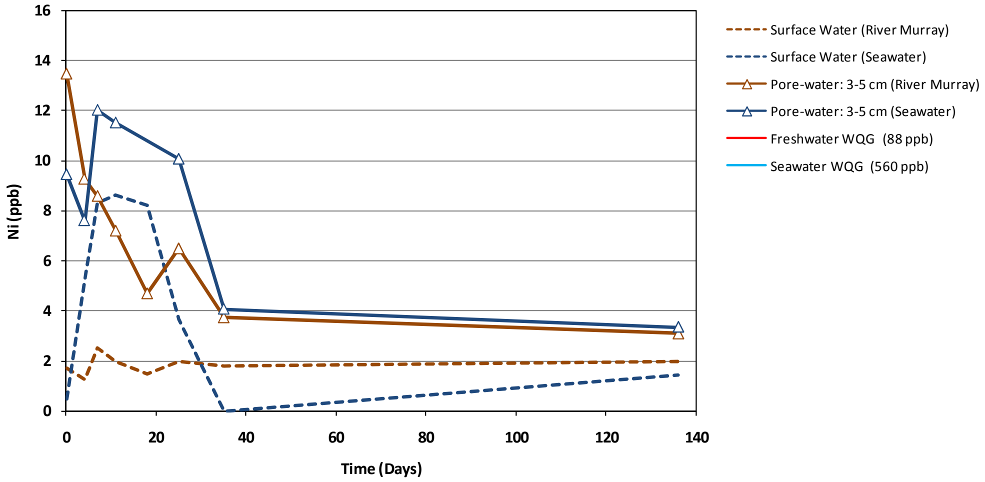

Figure 5-164. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

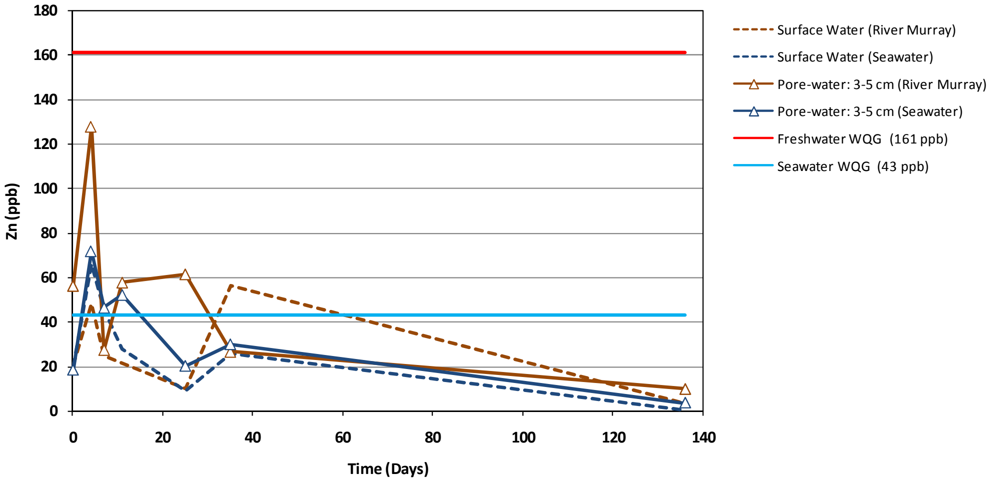

Figure 5-165. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted).

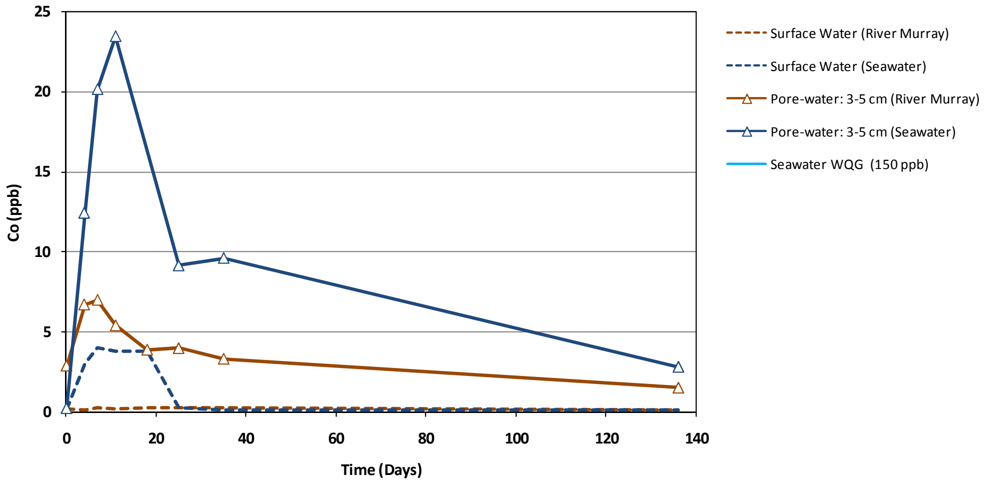

Figure 5-166. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

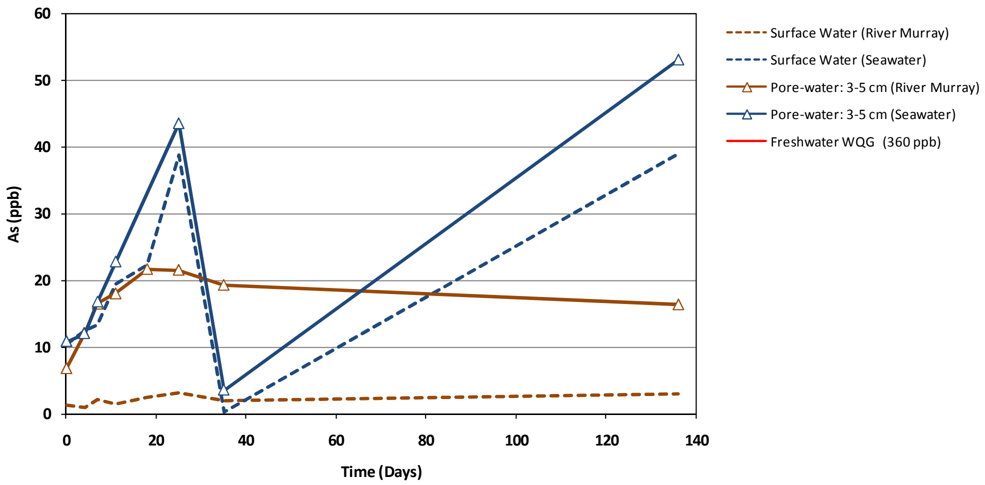

Figure 5-167. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

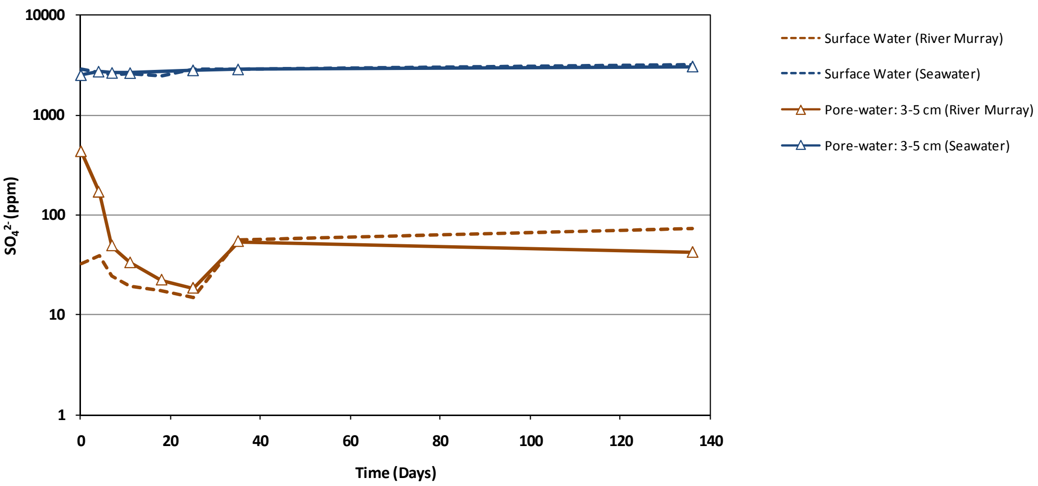

Figure 5-168. Sulfate (SO42-) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

5.3.15.3.3 General discussion of sediment behaviour

Inundation of these sediments has the potential to have an impact on inundating water quality for up to 136 days if diffusion is the dominant contaminant transport process operating within the sediment. The main potential water quality issues identified in this study over this timescale, by comparison with the appropriate Water Quality Guidelines, are elevated concentrations of Cu and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiching) is an appreciable contaminant transport process within the sediment (note: this situation was not simulated in this experiment), then elevated concentrations in the pore-water results indicate that there is potential for the concentrations of Cu, Zn and NH_3 to exceed the appropriate ANZECC trigger values depending on the degree of dilution in the overlying waters subsequent to mobilisation.

The data also clearly highlight the dynamic behaviour of these materials following inundation. The data indicate that the biogeochemical processes that affect potential contaminant mobilisation are clearly still active up to the 136 days of inundation examined in this study. Consequently there is a need to undertake long-term examinations of the response to inundation of these materials (such as in these experiments) to gain an adequate understanding of the behaviour of potential contaminants following inundation.

5.3.15.3.4 Effect of inundating water type

A clear and expected effect caused by the type of inundating water was caused by the salinity that was supplied by the seawater. This caused the salinities of the pore-waters underlying the seawater to increase considerably during inundation. It also resulted in an abundant supply of sulfate to the sediments. The pore-waters in these sediments became depleted in sulfate when River Murray water was used for inundation.

Apart from this salinity effect, the effect of the type of inundating water (i.e. River Murray water or seawater) on this sediment made only very minor impacts on the pH and alkalinity of the overlying waters and on the mobilisation of potential contaminants into the inundating waters during the experimental timescale. The mobilisation of As, Cu, Co and Ni into the inundating seawater were higher than that to the inundating River Murray water.

5.4 Discussion on results of inundation

Increasing ionic strength with increasing seawater concentrations can lead to a substantial increase in mobilisation of exchangeable trace metals. Wong *et al.* (submitted) showed that addition of a high ionic strength solution resulted in an immediate increase in the release of acidity and trace metals from acid sulfate soil materials in the short term (i.e. over a period of hours), even at low salt concentrations such as that found in brackish waters in estuarine environments. Desorption and increased acidity dominated the immediate effects of increasing ionic strength (Wong *et al.* submitted). Seawater is dominated by Na^{+}, Ca^{2+} and Mg^{2+}, which compete with other cationic metals for negatively charged sediment surfaces. The addition of a saline solution results in a direct ion-exchange process whereby seawater-derived ions exchange with H^{+} and Al^{3+}, causing acidification (Hindar *et al.* 1994).

Decreasing pH is attributed to two processes:

i) the displacement of adsorbed protons on the exchange surface due to competitive exchange, and
ii) the hydrolysis of displaced trace metals (Al^{3+}, Fe^{2+} and Mn) with increasing ionic strength of solution (Sayles and Mangelsdorf Jr 1977; Farrah *et al.* 1980).

As the ionic strength of the solution increases, protons sorbed on to negatively charged clay colloids are replaced by the major cations of seawater. Hydrolysis of the displaced acidic metal cations such as Fe^{2+} releases H^{+} to further increase acidity.

Previous studies have shown that floodplains which contain acid sulfate soils also frequently contain abundant surface accumulations of Fe (oxy)hydroxide minerals (Sullivan and Bush 2004) which commonly adsorb trace metals (Millward and Moore 1982; Tessier *et al.* 1985). Roden and Zachara (1996) found that rinsing sorbed Fe^{2+} from Fe (III) oxides with a slightly acidic solution can stimulate desorption of Fe^{2+} by altering the charge balance to enhance cation desorption, resulting in non-reductive dissolution of high surface area Fe (III) oxides (Roden and Zachara 1996). Prolonged seawater inundation will lead to reductive processes leading to dissolution of Fe (III) oxides. These processes can cause acidity to decrease and pH to increase (Johnston *et al.* 2009b,c), resulting in precipitation of Fe oxyhydroxides and enhanced release of other associated trace metals and metalloid (Burton *et al.* 2008a; Johnston *et al.* 2010a).

The surface water and pore-water inundation data for pH, nutrients and the selected metals and metalloids will be discussed in this section. Changes in sediment characteristics upon inundation will also be discussed.

5.4.1 General discussion

During the following discussion of the main potential contaminants or chemical properties, several conditions of this investigation should be kept in mind. These include:

1) Standing columns were used and as such diffusive transport would dominate. Were mass flow to dominate transport of soluble components then different results may well have been obtained.
2) The depth of water inundation over the soil material was 30 cm for this investigation. Greater or lesser effective dilutions would occur with greater and lesser depths of water, respectively, and this should be considered when assessing the hazard potential of the potential contaminant/nutrient concentrations observed under the experimental conditions.
3) The time allowed for this study was 136 days of incubation. Examination of the trends in the data strongly suggests that substantial changes in water quality are likely to occur after this 136 day period.

5.4.1.1 Water pH

The response of the inundating waters to the underlying sediments in terms of pH varied considerably. A summary of the surface water pH after 136 days of inundation for all sites is presented in Table 5-2.

Table 5-2. Surface water pH after 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	7.13	7.76
1	Waltowa (upper)	8.01	7.79
2	Waltowa (lower)	8.16	7.99
3	Meningie (upper)	7.76	7.98
4	Meningie (lower)	8.13	7.87
5	Tolderol (upper)	7.81	7.80
6	Tolderol (lower)	7.73	7.54
7	Point Sturt South	6.98	5.04
8	Point Sturt North (upper)	6.26	4.43
9	Point Sturt North (lower)	7.47	7.10
10	Milang (upper)	7.35	7.11
11	Milang (lower)	7.90	7.65
12	Ewe Island Barrage	8.21	7.80
13	Currency Creek	3.52	3.58
14	Poltalloch (upper)	3.05	2.96
15	Poltalloch (lower)	7.59	7.23

The inundating waters in eight (53%) of the fifteen sediments experienced acidification to the extent that the pH decreased to < 6.5 during the 136 days of inundation.

Only four (27%) of the inundating waters over the fifteen sediments fell below a pH of 5.0 during the 136 days of inundation.

Only two (14%) of the inundating waters over the fifteen sediments fell below a pH of 4.0 during the 136 days of inundation.

For three (38%) of the eight inundating waters that experienced acidification pH < 6.5 during the inundation, the acidification event experienced was immediate, short-lived (not extending up to 4 days duration) and relatively mild (with a minimum of pH for these sediments of 5.8)

Inundation by seawater generally had a greater acidification effect than did inundation by River Murray water during the earlier periods of inundation. The results suggest that during these periods the higher alkalinity of the seawater was insufficient (under the experimental conditions) to overcome the additional exchange of acidity from the sediments caused by the higher salinity of the seawater.

5.4.1.2 Alkalinity

A summary of the minimum surface water alkalinity over 136 days of inundation for all sites is presented in Table 5-3. For most soil materials (eleven (73%) of fifteen) the inundating waters essentially maintained their prior alkalinity levels over the 136 days of inundation. For the remaining 4 (27%) of soil materials the alkalinity levels of the inundating waters decreased appreciably during the inundation.

Table 5-3. Minimum surface water alkalinity (mmol/L) over136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	1.6	3.9
1	Waltowa (upper)	2.2	3.7
2	Waltowa (lower)	1.8	3.7
3	Meningie (upper)	1.3	3.4
4	Meningie (lower)	1.5	3.5
5	Tolderol (upper)	1.4	2.9
6	Tolderol (lower)	1.4	2.4
7	Point Sturt South	1.1	1.1
8	Point Sturt North (upper)	0.5	0.1
9	Point Sturt North (lower)	1.3	3.0
10	Milang (upper)	1.1	2.1
11	Milang (lower)	1.5	3.6
12	Ewe Island Barrage	2.3	3.7
13	Currency Creek	0.0	0.0
14	Poltalloch (upper)	0.0	0.0
15	Poltalloch (lower)	1.4	3.4

The alkalinity levels in the uppermost pore-waters generally increased or remained level during the incubation although there were a few sites where the pore-waters (in the very acidic soil materials) were initially completely depleted of alkalinity during the early stages of inundation. This shows that the sediments, excepting the few very acidic soil materials were capable of producing substantial alkalinity during the 136 days of inundation. The other data showing strong sulfate depletion in these soils strongly indicate that this alkalinity is consequent of sulfate reduction during organic matter decomposition.

Inundation by seawater - which initially contained higher alkalinity that River Murray water - produced inundating waters that had a higher alkalinity than those produced from the use of River Murray water.

5.4.1.3 Titratable Actual Acidity (TAA)

The TAAs of these materials were generally very low. A summary of the TAAs in the surface sediment (0 - 4 cm) prior to inundation for all sites is presented in Table 5-4. Soil materials from only two of the fifteen sites (i.e. Sites 13 (Currency Creek) and 14 (Poltalloch)) had TAAs that exceeded the trigger value (i.e. 18 mol H^+/tonne) usually used to identify acid sulfate soil materials of a sandy texture on the basis of their acidity.

Many of the soil materials that had TAAs lower than this trigger value also had very low pHs indicating that even these low pH soil materials have only a poor ability to supply readily available acidity to the overlying waters. This helps to explain the general lack of severe acidification of the overlying waters over the soil materials.

Table 5-4. Soil TAA (mol H^+/t) in surface sediment (0-4 cm) prior to inundation.

Site No.	Site Name	TAA (mol H^+/t)
1	Waltowa (upper)	0.00
2	Waltowa (lower)	0.00
3	Meningie (upper)	0.00
4	Meningie (lower)	0.00
5	Tolderol (upper)	1.26
6	Tolderol (lower)	1.11
7	Point Sturt South	3.54
8	Point Sturt North (upper)	4.06
9	Point Sturt North (lower)	0.00
10	Milang (upper)	1.66
11	Milang (lower)	0.00
12	Ewe Island Barrage	0.00
13	Currency Creek	6.55
14	Poltalloch (upper)	8.28
15	Poltalloch (lower)	0.00

5.4.1.4 Jarosite

Jarosite was visibly present in three of the very acidic soil materials (Sites 8, 13 and 14). Recent research at Southern Cross GeoScience indicates that jarosite is a mineral that can have limited stability in acid sulfate soil materials. This research indicates that the acidity in jarosite can be mobilised readily quickly according to the biogeochemical regimes imposed or that may develop in acid sulfate soil landscapes.

The increase in soluble K in the jarositic soil materials at two of these sites (i.e. Sites 8 and 14) during the River Murray water inundation indicates that jarosite may have been a readily available source of acidity in these materials. However, an increase in soluble K in the pore-waters did not happen in site 13 during the River Murray water inundation and further investigation is required to provide direct evidence of this process operating in the soil materials over the timescales of this experiment.

5.4.1.5 Iron (Fe)

Iron was mobilised to varying extents from most of the soil materials into the pore-waters during inundation. However, soluble iron was rarely sampled in the overlying waters in clearly recognizable concentrations. This was presumably due to oxidation and precipitation of any soluble iron diffusing upwards into the generally more oxic overlying waters.

Iron mobilisation was enhanced within seven (47%) of the fifteen soil materials when seawater was used for inundation.

A summary of the maximum iron concentration, maximum pH and minimum Eh in pore-waters (3-5 cm) over 136 days of inundation for all sites is presented in Table 5-5.

Table 5-5. Maximum iron concentration (ppm), maximum pH and minimum Eh (mV) in pore-waters (3-5 cm) over 136 days of inundation.

Site No.	Site Name	Fe_{Max} (ppm)		pH_{Max}		Eh_{Min} (mV)	
		River Murray	Seawater	River Murray	Seawater	River Murray	Seawater
1	Waltowa (upper)	16.13	43.19	7.15	7.35	129	107
2	Waltowa (lower)	2.14	9.46	7.83	7.96	156	114
3	Meningie (upper)	10.60	9.75	7.17	7.27	113	119
4	Meningie (lower)	13.68	33.17	7.44	7.43	105	115
5	Tolderol (upper)	5.24	5.27	7.60	7.58	144	144
6	Tolderol (lower)	19.05	9.65	6.88	6.92	138	175
7	Point Sturt South	84.26	25.14	4.69	4.45	464	461
8	Point Sturt North (upper)	165.57	124.98	4.61	5.85	381	310
9	Point Sturt North (lower)	1.19	6.94	7.25	7.12	241	118
10	Milang (upper)	52.56	35.23	6.69	6.77	155	146
11	Milang (lower)	2.21	3.55	7.19	7.50	142	142
12	Ewe Island Barrage	1.08	1.49	7.75	7.70	192	162
13	Currency Creek	127.92	145.16	3.75	3.63	540	557
14	Poltalloch (upper)	373.74	436.22	4.68	4.61	370	368
15	Poltalloch (lower)	3.45	3.91	7.56	7.58	156	131

5.4.1.6 Nitrate (NO_3^-)

A summary of the maximum surface water NO_3^- concentration over 136 days of inundation for all sites is presented in Table 5-6. None of the surface waters exceeded the recommended water quality guidelines for NO_3^- during the inundation study for any of the soil materials.

Table 5-6. Maximum surface water nitrate concentration (ppm N) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	0.185	0.025
1	Waltowa (upper)	1.285	1.745
2	Waltowa (lower)	0.605	2.120
3	Meningie (upper)	1.660	0.830
4	Meningie (lower)	0.685	0.955
5	Tolderol (upper)	0.640	1.780
6	Tolderol (lower)	0.665	3.030
7	Point Sturt South	1.505	1.440
8	Point Sturt North (upper)	1.265	0.080
9	Point Sturt North (lower)	0.835	2.455
10	Milang (upper)	2.075	9.745
11	Milang (lower)	5.280	6.095
12	Ewe Island Barrage	0.795	1.365
13	Currency Creek	0.690	0.065
14	Poltalloch (upper)	1.170	0.280
15	Poltalloch (lower)	0.470	1.760

5.4.1.7 Ammonia (NH_3)

A summary of the maximum surface water NH_3 concentration over 136 days of inundation for all sites is presented in Table 5-7. The surface waters for sites 1, 8, 10, 12, 13 and 14 exceeded the recommended water quality guidelines for NH_3 when seawater was used as the inundating water. The surface waters for sites 12 and 14 also exceeded the recommended water quality guidelines for NH_3 when River Murray was used as the inundating water.

Table 5-7. Maximum surface water ammonia concentration (ppm N) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	0.075	0.090
1	Waltowa (upper)	1.550	6.305
2	Waltowa (lower)	0.480	0.470
3	Meningie (upper)	0.555	0.705
4	Meningie (lower)	1.000	0.770
5	Tolderol (upper)	0.530	0.495
6	Tolderol (lower)	0.550	1.005
7	Point Sturt South	0.715	1.370
8	Point Sturt North (upper)	0.695	4.350
9	Point Sturt North (lower)	0.505	0.520
10	Milang (upper)	1.350	5.220
11	Milang (lower)	0.635	0.525
12	Ewe Island Barrage	5.065	5.385
13	Currency Creek	1.180	2.525
14	Poltalloch (upper)	5.375	6.420
15	Poltalloch (lower)	0.475	0.790

5.4.1.8 Arsenic (As)

Arsenic was mobilised to varying extents from most of the soil materials into the pore-waters during inundation. However, the As concentration did not exceed the appropriate freshwater quality trigger during any of the incubations. A summary of the maximum surface water As concentration over 136 days of inundation for all sites is presented in Table 5-8.

The inundating seawater generally appeared to enhance the mobilisation of As from both the soil materials into the inundating waters and within the soil materials.

Table 5-8. Maximum surface water arsenic concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	<1.00	<15.00
1	Waltowa (upper)	5.15	40.49
2	Waltowa (lower)	4.67	38.43
3	Meningie (upper)	7.05	40.41
4	Meningie (lower)	3.47	37.95
5	Tolderol (upper)	1.85	36.54
6	Tolderol (lower)	1.35	34.98
7	Point Sturt South	2.15	35.64
8	Point Sturt North (upper)	2.43	34.95
9	Point Sturt North (lower)	1.88	45.06
10	Milang (upper)	1.65	48.82
11	Milang (lower)	3.78	47.66
12	Ewe Island Barrage	21.08	67.51
13	Currency Creek	1.38	41.65
14	Poltalloch (upper)	1.59	40.79
15	Poltalloch (lower)	3.14	38.97

5.4.1.9 Copper (Cu)

A summary of the maximum surface water Cu concentration over 136 days of inundation for all sites is presented in Table 5-9. The surface waters for six inundated soils exceeded the recommended water quality guidelines for Cu when seawater was used as the inundating water. The surface waters for one inundated soil also exceeded the recommended water quality guidelines for Cu when River Murray was used as the inundating water.

Table 5-9. Maximum surface water copper concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	2.15	2.21
1	Waltowa (upper)	4.14	3.27
2	Waltowa (lower)	2.85	3.68
3	Meningie (upper)	5.55	3.24
4	Meningie (lower)	3.44	3.25
5	Tolderol (upper)	3.51	3.71
6	Tolderol (lower)	3.76	6.25
7	Point Sturt South	2.66	17.63
8	Point Sturt North (upper)	4.27	16.77
9	Point Sturt North (lower)	2.74	6.03
10	Milang (upper)	2.71	8.00
11	Milang (lower)	4.06	6.63
12	Ewe Island Barrage	2.85	1.95
13	Currency Creek	4.80	10.86
14	Poltalloch (upper)	316.57	32.51
15	Poltalloch (lower)	3.32	10.54

5.4.1.10 Nickel (Ni)

A summary of the maximum surface water Ni concentration over 136 days of inundation for all sites is presented in Table 5-10. None of the surface waters exceeded the recommended water quality guidelines for Ni during the inundation study for any of the soil materials.

Table 5-10. Maximum surface water nickel concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	1.47	<5.00
1	Waltowa (upper)	4.67	9.84
2	Waltowa (lower)	2.66	<5.00
3	Meningie (upper)	20.87	21.61
4	Meningie (lower)	3.30	<5.00
5	Tolderol (upper)	2.55	32.99
6	Tolderol (lower)	2.72	69.68
7	Point Sturt South	2.87	51.68
8	Point Sturt North (upper)	3.05	25.90
9	Point Sturt North (lower)	1.89	5.04
10	Milang (upper)	2.59	41.03
11	Milang (lower)	4.39	9.29
12	Ewe Island Barrage	2.41	5.67
13	Currency Creek	27.78	59.03
14	Poltalloch (upper)	11.12	27.40
15	Poltalloch (lower)	2.51	8.61

5.4.1.11 Zinc (Zn)

A summary of the maximum surface water Zn concentration over 136 days of inundation for all sites is presented in Table 5-11. All of the surface waters (except for site 12 the MBO material) exceeded the recommended water quality guidelines for Zn when seawater was used as the inundating water. The surface waters for site 14 also exceeded the recommended water quality guidelines for Zn when River Murray was used as the inundating water.

Table 5-11. Maximum surface water zinc concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	<1.00	<5.00
1	Waltowa (upper)	56.08	86.17
2	Waltowa (lower)	61.17	46.16
3	Meningie (upper)	95.73	48.15
4	Meningie (lower)	56.14	51.89
5	Tolderol (upper)	64.20	63.33
6	Tolderol (lower)	60.98	140.87
7	Point Sturt South	57.58	96.38
8	Point Sturt North (upper)	63.65	82.79
9	Point Sturt North (lower)	64.46	55.31
10	Milang (upper)	52.38	74.72
11	Milang (lower)	58.99	49.44
12	Ewe Island Barrage	64.47	36.71
13	Currency Creek	116.22	142.87
14	Poltalloch (upper)	608.61	169.32
15	Poltalloch (lower)	56.35	65.82

5.4.1.12 Cadmium (Cd)

A summary of the maximum surface water Cd concentration over 136 days of inundation for all sites is presented in Table 5-12. None of the surface waters exceeded the recommended water quality guidelines for Cd during the inundation study for any of the soil materials.

Table 5-12. Maximum surface water cadmium concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	<0.10	0.11
1	Waltowa (upper)	0.18	0.45
2	Waltowa (lower)	0.10	0.27
3	Meningie (upper)	0.39	0.38
4	Meningie (lower)	0.11	0.16
5	Tolderol (upper)	0.10	5.04
6	Tolderol (lower)	0.11	0.96
7	Point Sturt South	0.13	0.56
8	Point Sturt North (upper)	0.48	0.57
9	Point Sturt North (lower)	0.16	0.22
10	Milang (upper)	<0.10	0.46
11	Milang (lower)	<0.10	0.52
12	Ewe Island Barrage	<0.10	0.18
13	Currency Creek	0.59	0.78
14	Poltalloch (upper)	0.45	0.32
15	Poltalloch (lower)	<0.10	0.20

5.4.1.13 Cobalt (Co)

A summary of the maximum surface water Co concentration over 136 days of inundation for all sites is presented in Table 5-13. None of the surface waters exceeded the recommended water quality guidelines for Co during the inundation study for any of the soil materials.

Table 5-13. Maximum surface water cobalt concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	<1.00	<1.00
1	Waltowa (upper)	<1.00	4.02
2	Waltowa (lower)	<1.00	<1.00
3	Meningie (upper)	1.61	<1.00
4	Meningie (lower)	<1.00	<1.00
5	Tolderol (upper)	<1.00	5.93
6	Tolderol (lower)	<1.00	51.42
7	Point Sturt South	<1.00	40.32
8	Point Sturt North (upper)	1.45	15.01
9	Point Sturt North (lower)	<1.00	<1.00
10	Milang (upper)	<1.00	25.47
11	Milang (lower)	1.49	4.10
12	Ewe Island Barrage	<1.00	<1.00
13	Currency Creek	10.71	25.71
14	Poltalloch (upper)	13.87	34.69
15	Poltalloch (lower)	<1.00	3.99

5.4.1.14 Chromium (Cr)

A summary of the maximum surface water Cr concentration over 136 days of inundation for all sites is presented in Table 5-14. None of the surface waters exceeded the recommended water quality guidelines for Cr during the inundation study for any of the soil materials.

Table 5-14. Maximum surface water chromium concentration (ppb) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	2.39	<4.40
1	Waltowa (upper)	2.76	<4.40
2	Waltowa (lower)	2.99	5.70
3	Meningie (upper)	5.28	<4.40
4	Meningie (lower)	4.91	<4.40
5	Tolderol (upper)	4.23	<4.40
6	Tolderol (lower)	3.57	<4.40
7	Point Sturt South	2.89	6.68
8	Point Sturt North (upper)	3.91	4.65
9	Point Sturt North (lower)	2.60	<4.40
10	Milang (upper)	2.14	<4.40
11	Milang (lower)	2.44	<4.40
12	Ewe Island Barrage	3.18	4.77
13	Currency Creek	2.19	5.54
14	Poltalloch (upper)	1.93	4.91
15	Poltalloch (lower)	2.01	<4.40

5.4.1.15 Sulfate (SO_4^{2-})

An expected effect caused by the type of inundating water was the relatively abundant supply of sulfate to the sediments by the seawater. This caused the sulfate concentrations of the pore-waters underlying the seawater to increase considerably during inundation. In comparison most of the pore-waters in the soil materials examined in this study became (or were becoming) depleted in sulfate as the inundation proceeded when River Murray water (which had a relatively low sulfate content) was used for inundation.

The supply of sulfate has important implications for the biogeochemistry of these sediments as, *inter alia*, a ready supply of sulfate can:

1) enhance the rate of organic matter decomposition in reduced sediments and consequently greatly enhance the rate of mineralisation and mobilisation of a range of nutrients/contaminants, as well as

2) lead to potentially enhanced sulfidisation of these sediments. Sulfidisation may be observed as accumulation of iron sulfide but as stated at the start of this investigation, experience shows that 35 days of inundation is often too short a period of time to allow discrimination of changes in bulk iron sulfide concentrations. As will be discussed in the following sections, the 136 days of inundation used in this investigation were sufficient to allow such discrimination.

A summary of the maximum surface water sulfate concentration over 136 days of inundation for all sites is presented in Table 5-15.

Table 5-15. Maximum surface water sulfate concentration (ppm) over 136 days of inundation.

Site No.	Site Name	River Murray	Seawater
Initial	-	50	2,923
1	Waltowa (upper)	139	3,866
2	Waltowa (lower)	105	3,634
3	Meningie (upper)	1,255	5,298
4	Meningie (lower)	161	4,009
5	Tolderol (upper)	195	3,409
6	Tolderol (lower)	141	3,524
7	Point Sturt South	112	3,457
8	Point Sturt North (upper)	122	3,453
9	Point Sturt North (lower)	60	2,981
10	Milang (upper)	69	3,344
11	Milang (lower)	122	3,080
12	Ewe Island Barrage	81	2,979
13	Currency Creek	323	3,465
14	Poltalloch (upper)	309	3,219
15	Poltalloch (lower)	72	3,120

5.4.1.16 Sulfate Reduction Rates (SRR)

5.4.1.16.1 Sulfate reduction rates using the $^{35}SO_4^{2-}$ incubation method

The mean sulfate reduction rates at 2 sediment depths (i.e. 0-4 cm and 4-8 cm) using the $^{35}SO_4^{2-}$ method at day 136 following inundation with both Murray River water and seawater are shown below in Table 5-16. The sulfate reduction rates measured in each of the triplicate mini-cores are presented in Appendix 7. The mean sulfate reduction rate of triplicate mini-cores ranged from being less than the method detection limit to a maximum of 6.9 nmol/cm³/day (Table 5-16 and Figure 5-169). These values are at the lower end of the reported SRR's for near-surface marine sediments, which typically span 1 - 200 nmol/cm³/day.

Table 5-16. Mean sulfate reduction rates at day 136 as measured using the $^{35}SO_4^{2-}$ incubation method (nmol/cm³/day).

Site No.	Site Name	River Murray (0-4cm depth)	Seawater (0-4cm depth)	River Murray (4-8cm depth)	Seawater (4-8cm depth)
1	Waltowa (upper)	0.283	1.268	0.372	0.334
2	Waltowa (lower)	0.096	0.000	0.000	0.000
3	Meningie (upper)	0.000	0.000	0.000	0.000
4	Meningie (lower)	0.213	0.000	0.002	0.000
5	Tolderol (upper)	0.179	0.000	0.000	0.000
6	Tolderol (lower)	2.520	0.000	0.000	0.000
7	Point Sturt South	0.000	0.000	0.000	0.000
8	Point Sturt North (upper)	0.053	0.000	0.000	0.000
9	Point Sturt North (lower)	0.000	0.000	0.000	0.000
10	Milang (upper)	0.053	0.138	0.035	0.023
11	Milang (lower)	6.901	1.004	0.786	0.578
12	Ewe Island Barrage	5.453	2.733	0.620	0.170
13	Currency Creek	0.000	0.000	0.000	0.000
14	Poltalloch (upper)	0.000	1.059	0.000	0.394
15	Poltalloch (lower)	0.808	1.233	0.001	0.150

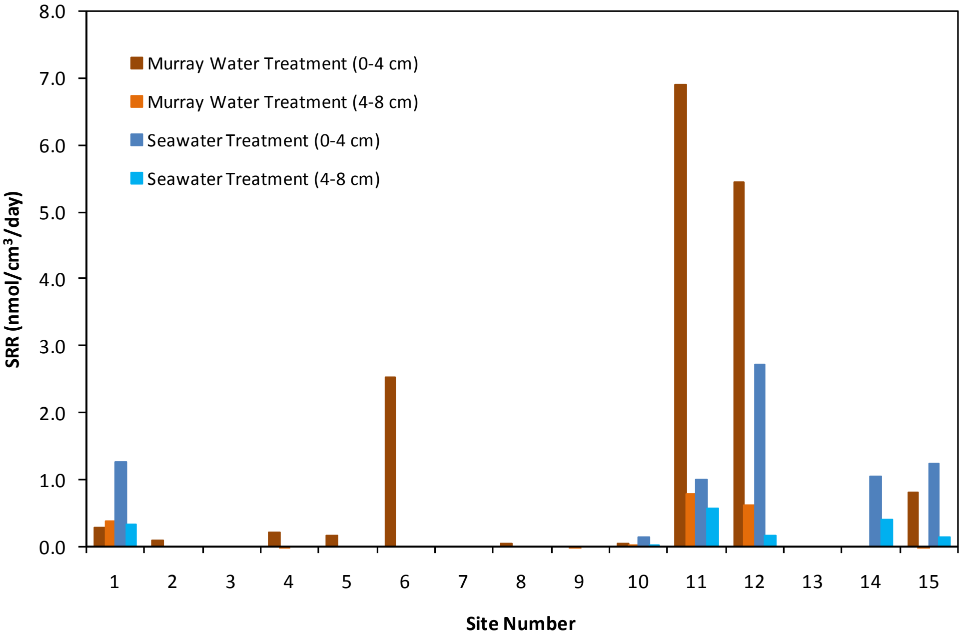

Figure 5-169. Comparison of the mean sulfate reduction rates (SSR) following inundation with River Murray and seawater using the 35SO42- incubation method.

5.4.1.16.2 Sulfate reduction rates (using CRS data) over the initial 35 day inundation period

The mean sulfate reduction rates following inundation at 3 sediment depths (i.e. 0-4 cm, 4-8 cm and 8-15 cm) using the change in Reduced Inorganic Sulfur over the initial 35 days are shown below in Table 5-17. The mean sulfate reduction rates below assume that all reduced sulfate accumulates (and is measured) as Reduced Inorganic Sulfur.

Table 5-17. Mean sulfate reduction rates following inundation using the reduced inorganic sulfur method over the initial 35 days (nmol/cm³/day).

Site No.	Site Name	River Murray			Seawater		
		0-4 cm	4-8 cm	8-15 cm	0-4 cm	4-8 cm	8-15 cm
1	Waltowa (upper)	0.00	0.00	0.00	0.00	0.00	0.00
2	Waltowa (lower)	0.00	0.00	0.00	0.00	0.00	0.00
3	Meningie (upper)	0.00	62.59	65.33	0.00	0.80	31.98
4	Meningie (lower)	0.00	0.00	0.00	0.00	0.00	0.00
5	Tolderol (upper)	0.00	0.00	0.00	0.00	0.00	0.00
6	Tolderol (lower)	0.00	0.00	0.00	0.00	0.00	0.00
7	Point Sturt South	0.00	0.00	0.00	0.00	0.00	0.00
8	Point Sturt North (upper)	0.00	0.00	0.00	0.00	0.00	0.00
9	Point Sturt North (lower)	0.00	0.00	0.00	0.00	0.00	0.00
10	Milang (upper)	0.00	0.00	0.00	0.00	0.00	185.63
11	Milang (lower)	0.00	0.00	0.00	0.00	0.00	0.00
12	Ewe Island Barrage	0.00	0.00	471.21	56.47	115.04	506.34
13	Currency Creek	0.00	0.00	0.00	0.00	0.00	279.63
14	Poltalloch (upper)	14.18	12.58	2.00	0.00	2.33	0.00
15	Poltalloch (lower)	0.00	0.00	0.00	0.00	n.a.	15.69

The mean sulfate reduction rates to 15 cm depth over the first 35 days of inundation for all sites (including site 12 (the Ewe Island MBO)) are 18.34 nmol/cm³/day for River Murray water inundation and 34.82 nmol/cm³/day for seawater inundation.

The mean sulfate reduction rates to 15 cm depth over the first 35 days of inundation for sandy sites (excluding site 12 (the Ewe Island MBO)) are 3.95 nmol/cm³/day for River Murray water inundation and 17.16 nmol/cm³/day for seawater inundation. These sulfate reduction rates are weighted to take into account the differing depths of the soil layers: the third layer is 7 cm thick, whereas the upper two layers are both 4 cm thick.

5.4.1.16.3 Sulfate reduction rates (using CRS data) over the whole 136 day inundation period

The mean sulfate reduction rates following inundation at 3 sediment depths (i.e. 0-4 cm, 4-8 cm and 8-15 cm) using the change in Reduced Inorganic Sulfur over 136 days are shown below in Table 5-18. The mean sulfate reduction rates below assume that all reduced sulfate accumulates (and is measured) as Reduced Inorganic Sulfur.

Table 5-18. Mean sulfate reduction rates following inundation using the reduced inorganic sulfur method over 136 days (nmol/cm³/day).

Site No.	Site Name	River Murray			Seawater		
		0-4 cm	4-8 cm	8-15 cm	0-4 cm	4-8 cm	8-15 cm
1	Waltowa (upper)	31.48	12.34	0.00	23.07	10.61	0.00
2	Waltowa (lower)	0.00	0.00	0.00	0.00	0.00	0.00
3	Meningie (upper)	0.00	0.00	0.00	0.00	0.00	7.15
4	Meningie (lower)	0.00	0.00	0.00	0.00	0.00	0.00
5	Tolderol (upper)	0.00	0.00	0.00	0.00	0.00	0.00
6	Tolderol (lower)	0.00	0.00	0.00	0.00	0.00	0.00
7	Point Sturt South	0.00	0.00	2.84	0.00	0.00	0.00
8	Point Sturt North (upper)	1.63	1.08	0.00	0.00	0.00	0.00
9	Point Sturt North (lower)	0.00	0.00	0.00	0.00	0.00	0.00
10	Milang (upper)	12.58	20.66	0.00	0.05	10.56	0.18
11	Milang (lower)	5.40	6.56	10.85	0.00	4.25	0.00
12	Ewe Island Barrage	32.71	0.00	34.38	44.82	121.98	876.16
13	Currency Creek	0.00	0.00	23.24	0.00	0.00	152.03
14	Poltalloch (upper)	15.92	9.88	33.95	1.82	62.73	0.00
15	Poltalloch (lower)	3.93	9.91	25.39	0.00	0.00	0.00

The mean sulfate reduction rates to 15 cm depth over the 136 days of inundation for all sites (including site 12 (the Ewe Island MBO)) are 6.98 nmol/cm³/day for River Murray water inundation and 37.19 nmol/cm³/day for seawater inundation. The mean sulfate reduction rates to 15 cm depth over the 136 days of inundation for sandy sites (excluding site 12 (the Ewe Island MBO)) are 5.71

nmol/cm^3/day for River Murray water inundation and 7.47 nmol/cm^3/day for seawater inundation. These sulfate reduction rates are also weighted to take into account the differing depths of the soil layers: the third layer is 7 cm thick, whereas the upper two layers are both 4 cm thick.

5.4.1.16.4 Discussion of mean sulfate reduction rates

The determination of the mean sulfate reduction rates show the following main findings:

- The mean sulfate reduction rates were highly variable from site to site.

- The highest mean sulfate reduction rates using the change in Reduced Inorganic Sulfur over 136 days were measured in the MBO (site 12, Ewe Island Barrage) especially at the lower soil depth. When this data was used it greatly increased the mean sulfate reduction rates over the lake sediments. Much of the following data pertains to only the 14 sandy sites.

- For sandy sites initially (over 35 days) the estimated mean sulfate reduction rates were initially higher when seawater was used, but these mean sulfate reduction rates decreased over time so that over 136 days the mean sulfate reduction rates was similar regardless of inundating water type.

- For sandy sites initially (over 35 days) the estimated mean sulfate reduction rates were initially lower when River Murray water was used (with only two of the fourteen sandy materials accumulating Reduced Inorganic Sulfur), but over 136 days eight of these sandy materials had accumulated Reduced Inorganic Sulfur. The mean sulfate reduction rate for these sandy materials when inundated by River Murray water increased slightly over the 136 day inundation period.

- The mean sulfate reduction rates over both the 35 days and 136 days of inundation (Tables 5-17 and 5-18) were substantially higher when estimated using the increase in Reduced Inorganic Sulfur method over this time to estimate mean sulfate reduction rates than when $^{35}SO_4^{2-}$ incubation method was used at day 136 (Table 5-16). Along with the previous discussion, this observation suggests that - over all sites - sulfate reduction had reduced considerably by day 136 compared to earlier periods of the inundation.

- This generalisation not withstanding it is clear that some soil materials that had not experienced sulfate reduction (leading to the formation of Reduced Inorganic Sulfur) after even 35 days of inundation subsequently - and presumably as a result of the development of suitable geochemical regimes consequent of prolonged inundation – began to experience sulfate reduction at later stages (as evidenced by the accumulation of Reduced Inorganic Sulfur after day 35 of the inundation).

- Clearly the data also demonstrates that some soil materials that were reducing sulfate at day 136 (as measured by the $^{35}SO_4^{2-}$ incubation method) had not accumulated Reduced Inorganic Sulfur after day 136 of the inundation indicating that, as is well known, only a fraction of the sulfate that is reduced in a sediment is converted to Reduced Inorganic Sulfur.

- If we assume the longer term (i.e. over 136 days) mean for sandy soils using the increase in Reduced Inorganic Sulfur method is the appropriate rate to use - for both seawater and River Murray water - then the mean sulfate reduction rate is **~ 7** nmol/cm^3/day a value nearly an order of magnitude higher than that gained from the $^{35}SO_4^{2-}$ method when used at day 136. Use of **7** nmol/cm^3/day will result in a mean acidification rate of **-0.014** mol H^+/m^3/day (or to use their respective values, **-0.011** mol H^+/m^3/day for inundation with River Murray water, and **-0.016** mol H^+/m^3/day for inundation with seawater).

5.4.1.17 Soluble sulfide

Soluble sulfide was not detected in any of the surface waters during the inundation (Appendix 6). Soluble sulfide was only detected in the pore-waters at Sites 1 and 10. This does not indicate that sulfate reduction was not occurring at the other sites (and clearly sulfate was being removed from the pore-waters as discussed elsewhere), but rather that any sulfide formed as a result of sulfate reduction is being rapidly transformed by other processes.

5.4.1.18 Accumulation of solid phase sulfides

Sulfides were generally at very low levels in the soil materials prior to inundation and had not accumulated measurably during the 35 days of inundation with either seawater or River Murray water. It should be noted that this was expected and that the longer term incubation of 136 days produced measurable sulfide mineral accumulation in the sediments the trends of which were in accord with the direct sulfate reduction rates measured by the $^{35}SO_4^{2-}$ incubation method.

5.4.1.19 Factors limiting sulfate reduction

The process of sulfate reduction in sediments is important for several reasons including the production of alkalinity, the production of potential acidity (in the form of sulfides) and the immobilisation of metals. Figures 5-170 and 5 -171 indicate that the major factor limiting sulfate reduction in these sediments (as measured by accumulation of CRS) over the 136 days was the availability of organic carbon in the sediments rather than the availability of sulfate in the pore waters. The organic carbon contents of these surface sediments are very low with most being < 0.10% organic carbon on a gravimetric basis.

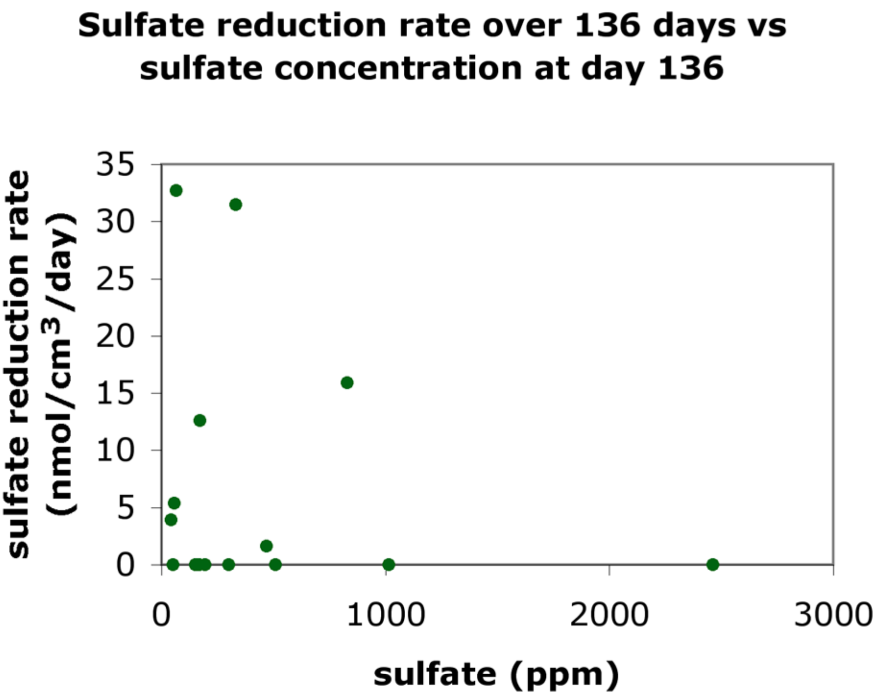

Figure 5-170. Comparison of the mean sulfate reduction rates (SSR) in the 0-4 cm sediment layer following inundation with River Murray water over 136 days using CRS data with sulfate concentrations in the 3 -5 cm layer at day 136.

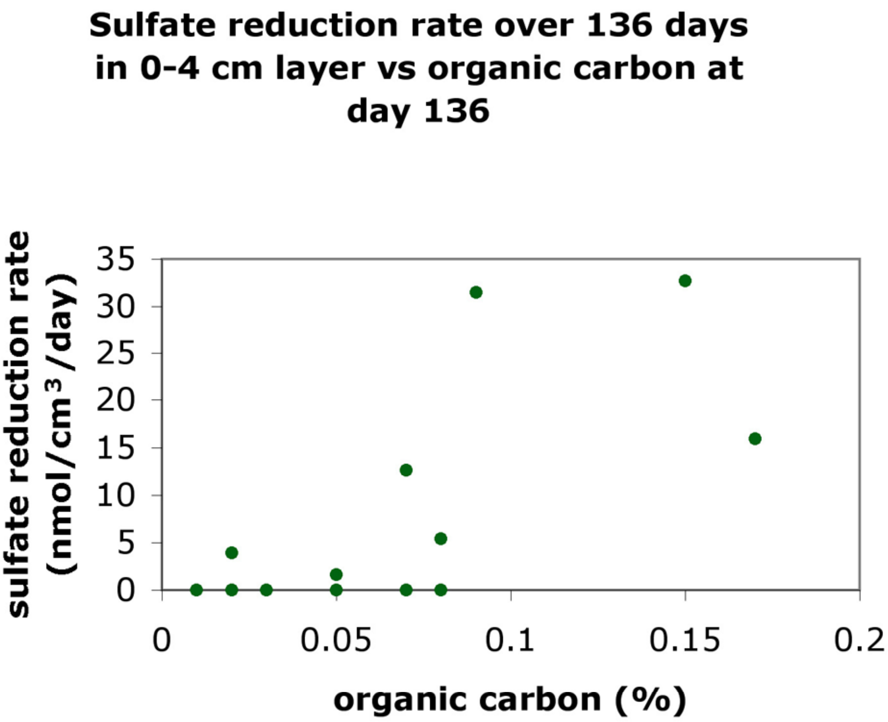

Figure 5-171. Comparison of the mean sulfate reduction rates (SSR) in the 0-4 cm sediment layer following inundation with River Murray water over 136 days using CRS data with organic carbon concentrations in the 3 -5 cm layer at day 136.

It should also be noted that even though the pH of some of the sediments were very acidic that sulfate reduction still was occurring at these low pHs. For example, the 0-4 cm layer of the River Murray water inundated sediment from site 14 (Poltalloch) experienced a pH range of between 2.5 and 4.7 during the 136 days of inundation, but even in this very low pH range, appreciable sulfate reduction had taken place. Appreciable sulfate reduction in sediments has been recorded under even more acidic conditions (e.g. pHs < 3) (Koschorreck *et al*. 2003).

5.4.2 Changes in sediment characteristics after inundation

Apart from salinity related properties that were affected by addition of seawater, few major changes in the main solid phase sediment properties were apparent after 35 days of inundation.

As has been discussed previously, there were clearly major changes in the soil pore-water characteristics subsequent to inundation (e.g. Eh, pH, iron and other soluble component mobilisation, and salinity (especially when seawater was used to inundate the soils)). Notably, considerable increases in pH and alkalinity occurred within the 136 day inundation in the uppermost surface soil layer of the sites that initially contained acidic soil materials (e.g. Sites 7, 8, 10, 13, and 14). The development of such less acidic surface layers could act as a geochemical constriction to retard the diffusive flux of acidity and potential contaminants from deeper in the profile to overlying waters, suggesting that acidity in these profiles may need to be located surficially to appreciably affect the acidity/alkalinity of the inundating waters in the short to medium term when diffusion is the dominant transport mechanism. For those sites where the soil contained visible jarosite in the surface layers the observed increase in pH of the surficial layers was not as strong as that observed in the other acidic soil sites and the pH increase upon inundation in these jarositic sites may be limited by buffering from this mineral.

5.4.3 Effect of inundating water type on mobilisation of chemical species

There were clear differences in the effect of the inundating waters on the extent and rates of mobilisation of chemical species during the period of inundation. Table 5-19 below summarises the chemical species exceeding the water quality trigger values recommended for this study. The data indicate that exceedences of especially Zn and NH_3 were much more likely in the inundating waters when those inundating waters were seawater. This is as discussed elsewhere presumably at least partially a result of ion exchange processes. Such processes and outcomes have been observed elsewhere by Southern Cross GeoScience when acid sulfate soils are inundated by saline waters.

Table 5-19. Summary of parameters exceeding the WQG trigger values for surface waters after River Murray water and seawater inundation (The parameters in bold text exceed the relevant water quality guideline after 136 days of inundation).

Site No.	Site Name	River Murray	Seawater
1	Waltowa, Lake Albert	-	NH_3, Zn
2	Waltowa, Lake Albert	-	Zn
3	Meningie, Lake Albert	-	Zn
4	Meningie, Lake Albert	-	Zn
5	Tolderol, Lake Alexandrina	-	Zn
6	Tolderol, Lake Alexandrina	-	Zn
7	Point Sturt (South), Lake Alexandrina	-	**Cu, Zn**
8	Point Sturt (North), Lake Alexandrina	-	**NH_3, Cu, Zn**
9	Point Sturt (North), Lake Alexandrina	-	Zn
10	Milang, Lake Alexandrina	-	NH_3, **Cu**, Zn
11	Milang, Lake Alexandrina	-	Zn
12	Ewe Island Barrage	NH_3	NH_3, Zn
13	Currency Creek	-	**NH_3, Cu, Zn**
14	Poltalloch Station, Lake Alexandrina	**NH_3, Cu, Zn**	**NH_3, Cu, Zn**
15	Poltalloch Station, Lake Alexandrina	-	**Cu**, Zn

Figure 5-172 shows a comparison of the mean net apparent alkalinity flux rates for each site over the 35 days of inundation using the two different water types. The strong linear relationship indicates that rather than providing a source of alkalinity to help mitigate against acidification of the waters in the lakes as had been previously discussed as a solution for acidification, that the introduction of seawater into the lakes would - especially under the proposed conditions that would result in negligible tidal exchange of seawater in the lakes - more likely result in both greater fluxes of acidity and lower fluxes of alkalinity from inundated sediments into the inundating lake water. Both of these would tend to enhance acidification of the waters in the lakes rather than reduce them. For example, the mean net flux of alkalinity from the 15 sites from the sediment to the overlying River Murray water during the 35 days of inundation was 6.7×10^{-3} moles m^2 day^{-1} indicating a flow of alkalinity from the sampled sediments to the overlying River Murray water. In contrast, the mean net flux of alkalinity from the 15 sites from the sediment to the overlying seawater during the 35 days of inundation was -5.1×10^{-3} moles m^2 day^{-1} indicating an average flow of acidity from the sampled sediments to the overlying seawater.

After 136 days of inundation the mean net flux of alkalinity from the 15 sites from the sediment to the overlying water was 2.7×10^{-3} moles m^2 day^{-1} indicating a flow of alkalinity from the sampled sediments to the overlying River Murray water. In contrast, the mean net flux of alkalinity from the 15 sites from the sediment to the overlying seawater during the 136 days of inundation was -1.5×10^{-3} moles m^2 day^{-1} indicating an average flow of acidity from the sampled sediments to the overlying seawater. These lower values after 136 days of inundation indicate that the magnitude of the flows of acidity to the overlying waters (in the case of seawater inundation) and of alkalinity to the overlying waters (in the case of River Murray water inundation) tended to diminish over the 100 days of inundation from day 35.

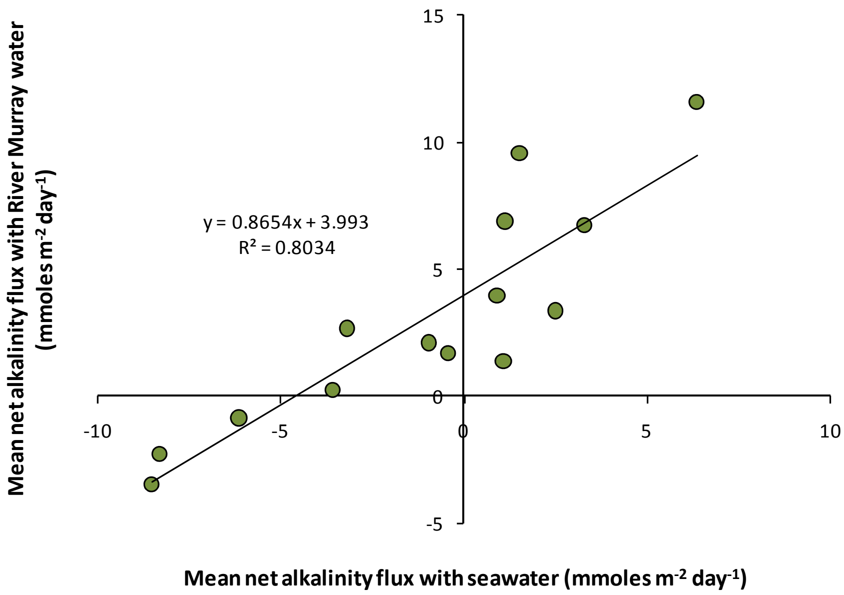

Figure 5-172. Comparison of the mean apparent net alkalinity flux for each site over 136 days of inundation using different water.

The results indicate that the hazards consequent of inundation of the exposed sandy sediments around the lakes arising from mobilisation of potential contaminants and acidification would likely be appreciably larger were seawater used - under the conditions proposed as explained above - to inundate these sediments rather than River Murray water.

5.4.4 Apparent net diffusion rates from soil materials to inundating water

The apparent net diffusion rates of soluble constituents from the inundated soil materials to the overlying inundating waters can be simply determined by the change in concentration of those constituents over time. It has been noted elsewhere in this report (and from many of the figures) that the changes in concentrations of many soluble constituents in the overlying waters were not a simple linear trend. This is no doubt due to the range of slowly changing biogeochemical processes that result from the progression of geochemical regimes created by inundation.

In addition some soluble constituents that appear in increasing concentrations in the inundating waters during the initial inundation phase, decrease in concentration in later inundation phases. Consequently, the apparent net diffusion rates for most soluble constituents change appreciably during the inundation.

The choice of time period over which to calculate an apparent net diffusion rate depends on the time period of interest for the investigator and there are a multitude of possibilities. In this section, rather than calculate of all these possibilities, the maximum apparent net diffusion rates of a range of constituents are given in Tables 5-20 - 5-23. The apparent net diffusion rates for these constituents over the experimental sampling intervals are also presented in Appendix 5 (Tables 9-767 – 9-776).

There are a number of assumptions that underlie the simple approach to calculation of apparent net diffusion rates used here. These include that the process leading to changes in concentration of soluble components in the overlying waters is due solely to diffusion across the sediment/inundating water interface. In reality there are a number of other processes occurring that influence this estimation of net diffusion rates. These include: precipitation of components that were soluble in the sediment but not in the overlying waters, and; the production of components in the overlying waters themselves.

Apparent net diffusion rates (ANRD) were calculated by the equation below:

$$ANDR_i = \frac{\Delta C_i}{M_i} \times \frac{300}{d}$$

$ANDR_i$ = apparent net diffusion rate of constituent *i* in moles m^{-2} day^{-1}.

ΔC_i = change in concentration (g/l) of constituent *i* over d days.

M_i = molecular mass (g) of constituent *i*

d = days over which change in concentration occurs.

Table 5-20. Mean and maximum apparent net diffusion rates for alkalinity over the 136 days of inundation.

	Mean Alkalinity Diffusion Rate		Maximum Alkalinity Diffusion Rate	
	River Murray	Seawater	River Murray	Seawater
Site	moles m^{-2} day^{-1}		moles m^{-2} day^{-1}	
1	9.58×10^{-3}	1.53×10^{-3}	80.84×10^{-3}	308.03×10^{-3}
2	6.73×10^{-3}	3.29×10^{-3}	44.06×10^{-3}	475.96×10^{-3}
3	1.39×10^{-3}	1.10×10^{-3}	30.75×10^{-3}	230.32×10^{-3}
4	3.38×10^{-3}	2.53×10^{-3}	40.39×10^{-3}	184.57×10^{-3}
5	2.12×10^{-3}	-0.95×10^{-3}	30.18×10^{-3}	168.58×10^{-3}
6	2.67×10^{-3}	-3.17×10^{-3}	34.19×10^{-3}	97.65×10^{-3}
7	-0.85×10^{-3}	-6.14×10^{-3}	25.19×10^{-3}	111.23×10^{-3}
8	-2.25×10^{-3}	-8.29×10^{-3}	24.98×10^{-3}	36.66×10^{-3}
9	1.69×10^{-3}	-0.41×10^{-3}	32.99×10^{-3}	88.09×10^{-3}
10	0.24×10^{-3}	-3.56×10^{-3}	34.58×10^{-3}	42.82×10^{-3}
11	6.90×10^{-3}	1.14×10^{-3}	68.23×10^{-3}	66.01×10^{-3}
12	11.57×10^{-3}	6.37×10^{-3}	120.53×10^{-3}	124.65×10^{-3}
13	-3.44×10^{-3}	-8.51×10^{-3}	26.33×10^{-3}	11.02×10^{-3}
14	-3.44×10^{-3}	-8.51×10^{-3}	88.10×10^{-3}	0.19×10^{-3}
15	3.97×10^{-3}	0.92×10^{-3}	77.92×10^{-3}	48.51×10^{-3}

Table 5-21. Maximum apparent net diffusion rates during the incubation for selected constituents (NO_3^-, NH_3, Ni).

	NO_3^-		NH_3		Ni	
	River Murray	Seawater	River Murray	Seawater	River Murray	Seawater
Site	moles m^{-2} day^{-1}		moles m^{-2} day^{-1}		moles m^{-2} day^{-1}	
1	2.59 x10^{-3}	2.60 x10^{-3}	7.61 x10^{-3}	15.29 x10^{-3}	2.68 x10^{-6}	4.41 x10^{-6}
2	0.71 x10^{-3}	2.43 x10^{-3}	2.21 x10^{-3}	1.07 x10^{-3}	0.81 x10^{-6}	3.62 x10^{-6}
3	1.12 x10^{-3}	0.25 x10^{-3}	3.57 x10^{-3}	1.10 x10^{-3}	1.62 x10^{-6}	6.22 x10^{-6}
4	0.83 x10^{-3}	1.24 x10^{-3}	3.89 x10^{-3}	2.87 x10^{-3}	1.14 x10^{-6}	2.12 x10^{-6}
5	0.68 x10^{-3}	8.53 x10^{-3}	2.89 x10^{-3}	1.13 x10^{-3}	1.70 x10^{-6}	30.08 x10^{-6}
6	1.26 x10^{-3}	1.28 x10^{-3}	3.36 x10^{-3}	2.43 x10^{-3}	0.88 x10^{-6}	87.91 x10^{-6}
7	0.80 x10^{-3}	0.38 x10^{-3}	3.43 x10^{-3}	2.12 x10^{-3}	1.21 x10^{-6}	17.67 x10^{-6}
8	1.42 x10^{-3}	0.11 x10^{-3}	3.46 x10^{-3}	5.74 x10^{-3}	1.66 x10^{-6}	13.41 x10^{-6}
9	0.71 x10^{-3}	3.99 x10^{-3}	2.79 x10^{-3}	0.99 x10^{-3}	0.51 x10^{-6}	3.81 x10^{-6}
10	3.35 x10^{-3}	13.48 x10^{-3}	4.29 x10^{-3}	19.59 x10^{-3}	0.24 x10^{-6}	43.70 x10^{-6}
11	0.94 x10^{-3}	14.43 x10^{-3}	3.39 x10^{-3}	0.72 x10^{-3}	0.51 x10^{-6}	6.25 x10^{-6}
12	0.99 x10^{-3}	2.74 x10^{-3}	8.71 x10^{-3}	8.12 x10^{-3}	0.96 x10^{-6}	2.55 x10^{-6}
13	0.63 x10^{-3}	0.26 x10^{-3}	3.36 x10^{-3}	2.63 x10^{-3}	2.38 x10^{-6}	30.96 x10^{-6}
14	1.21 x10^{-3}	0.50 x10^{-3}	3.61 x10^{-3}	6.54 x10^{-3}	2.10 x10^{-6}	13.16 x10^{-6}
15	0.60 x10^{-3}	0.93 x10^{-3}	2.57 x10^{-3}	1.91 x10^{-3}	2.12 x10^{-6}	6.26 x10^{-6}

Table 5-22. Maximum apparent net diffusion rates during the incubation for selected constituents (Cu, As, Cd).

	Cu		As		Cd	
	River Murray	Seawater	River Murray	Seawater	River Murray	Seawater
Site	moles m^{-2} day^{-1}		moles m^{-2} day^{-1}		moles m^{-2} day^{-1}	
1	2.70 x10^{-6}	4.57 x10^{-6}	1.63 x10^{-6}	10.19 x10^{-6}	0.13 x10^{-6}	0.04 x10^{-6}
2	1.46 x10^{-6}	4.58 x10^{-6}	1.03 x10^{-6}	10.39 x10^{-6}	0.08 x10^{-6}	0.11 x10^{-6}
3	1.62 x10^{-6}	3.44 x10^{-6}	0.59 x10^{-6}	12.24 x10^{-6}	0.12 x10^{-6}	0.09 x10^{-6}
4	2.40 x10^{-6}	4.45 x10^{-6}	0.66 x10^{-6}	13.43 x10^{-6}	0.03 x10^{-6}	0.05 x10^{-6}
5	1.93 x10^{-6}	3.85 x10^{-6}	0.44 x10^{-6}	14.71 x10^{-6}	0.04 x10^{-6}	2.89 x10^{-6}
6	2.73 x10^{-6}	4.22 x10^{-6}	0.47 x10^{-6}	11.62 x10^{-6}	0.03 x10^{-6}	0.56 x10^{-6}
7	2.35 x10^{-6}	5.91 x10^{-6}	0.49 x10^{-6}	7.51 x10^{-6}	0.04 x10^{-6}	0.12 x10^{-6}
8	3.17 x10^{-6}	8.05 x10^{-6}	0.81 x10^{-6}	8.34 x10^{-6}	0.16 x10^{-6}	0.12 x10^{-6}
9	1.50 x10^{-6}	3.07 x10^{-6}	0.68 x10^{-6}	9.60 x10^{-6}	0.03 x10^{-6}	0.07 x10^{-6}
10	1.05 x10^{-6}	8.84 x10^{-6}	0.83 x10^{-6}	16.94 x10^{-6}	0.02 x10^{-6}	0.24 x10^{-6}
11	1.39 x10^{-6}	6.94 x10^{-6}	1.22 x10^{-6}	11.54 x10^{-6}	0.03 x10^{-6}	0.30 x10^{-6}
12	1.15 x10^{-6}	1.74 x10^{-6}	4.09 x10^{-6}	17.79 x10^{-6}	0.02 x10^{-6}	0.02 x10^{-6}
13	1.71 x10^{-6}	5.74 x10^{-6}	0.43 x10^{-6}	12.95 x10^{-6}	0.04 x10^{-6}	0.21 x10^{-6}
14	49.78 x10^{-6}	17.83 x10^{-6}	0.59 x10^{-6}	7.51 x10^{-6}	0.03 x10^{-6}	0.14 x10^{-6}
15	1.39 x10^{-6}	2.52 x10^{-6}	1.47 x10^{-6}	9.35 x10^{-6}	0.02 x10^{-6}	0.08 x10^{-6}

Table 5-23. Maximum apparent net diffusion rates during the incubation for selected constituents (Zn, Cr, Co).

	Zn		Cr		Co	
	River Murray	Seawater	River Murray	Seawater	River Murray	Seawater
Site	moles m^{-2} day^{-1}		moles m^{-2} day^{-1}		moles m^{-2} day^{-1}	
1	43.81 $\times 10^{-6}$	34.15 $\times 10^{-6}$	0.63 $\times 10^{-6}$	2.02 $\times 10^{-6}$	0.72 $\times 10^{-6}$	2.59 $\times 10^{-6}$
2	52.45 $\times 10^{-6}$	18.16 $\times 10^{-6}$	0.96 $\times 10^{-6}$	3.57 $\times 10^{-6}$	0.06 $\times 10^{-6}$	1.13 $\times 10^{-6}$
3	88.57 $\times 10^{-6}$	37.98 $\times 10^{-6}$	1.83 $\times 10^{-6}$	1.19 $\times 10^{-6}$	0.56 $\times 10^{-6}$	0.35 $\times 10^{-6}$
4	23.04 $\times 10^{-6}$	18.57 $\times 10^{-6}$	2.00 $\times 10^{-6}$	2.16 $\times 10^{-6}$	0.28 $\times 10^{-6}$	0.22 $\times 10^{-6}$
5	43.62 $\times 10^{-6}$	21.86 $\times 10^{-6}$	1.56 $\times 10^{-6}$	0.76 $\times 10^{-6}$	0.13 $\times 10^{-6}$	6.70 $\times 10^{-6}$
6	49.85 $\times 10^{-6}$	142.52 $\times 10^{-6}$	1.93 $\times 10^{-6}$	1.16 $\times 10^{-6}$	0.06 $\times 10^{-6}$	63.26 $\times 10^{-6}$
7	31.77 $\times 10^{-6}$	62.28 $\times 10^{-6}$	2.96 $\times 10^{-6}$	2.02 $\times 10^{-6}$	0.03 $\times 10^{-6}$	9.44 $\times 10^{-6}$
8	47.37 $\times 10^{-6}$	72.40 $\times 10^{-6}$	3.70 $\times 10^{-6}$	1.55 $\times 10^{-6}$	1.17 $\times 10^{-6}$	7.86 $\times 10^{-6}$
9	26.27 $\times 10^{-6}$	19.27 $\times 10^{-6}$	1.57 $\times 10^{-6}$	1.55 $\times 10^{-6}$	0.22 $\times 10^{-6}$	0.39 $\times 10^{-6}$
10	44.83 $\times 10^{-6}$	42.40 $\times 10^{-6}$	0.74 $\times 10^{-6}$	1.65 $\times 10^{-6}$	0.07 $\times 10^{-6}$	24.99 $\times 10^{-6}$
11	37.95 $\times 10^{-6}$	23.57 $\times 10^{-6}$	1.32 $\times 10^{-6}$	0.77 $\times 10^{-6}$	1.50 $\times 10^{-6}$	2.45 $\times 10^{-6}$
12	37.81 $\times 10^{-6}$	14.04 $\times 10^{-6}$	1.89 $\times 10^{-6}$	2.14 $\times 10^{-6}$	0.16 $\times 10^{-6}$	0.51 $\times 10^{-6}$
13	85.95 $\times 10^{-6}$	47.50 $\times 10^{-6}$	1.27 $\times 10^{-6}$	0.57 $\times 10^{-6}$	0.65 $\times 10^{-6}$	11.73 $\times 10^{-6}$
14	74.54 $\times 10^{-6}$	92.00 $\times 10^{-6}$	1.08 $\times 10^{-6}$	1.62 $\times 10^{-6}$	1.98 $\times 10^{-6}$	13.39 $\times 10^{-6}$
15	32.16 $\times 10^{-6}$	53.79 $\times 10^{-6}$	0.84 $\times 10^{-6}$	0.89 $\times 10^{-6}$	0.24 $\times 10^{-6}$	3.67 $\times 10^{-6}$

5.4.4 Comparison of the laboratory and field results

The field component of this study was undertaken by CSIRO on two areas of Lake Alexandrina including: (i) Boggy Creek, Hindmarsh Island, and (ii) the south side of Point Sturt peninsula (Hicks *et al.* 2009). The main findings from the laboratory study for Point Sturt (South) (Site 7) have been compared to the field study results. A summary is presented below in Table 5-24. A comparison of the results from both studies show the similarity of the findings, particularly that the ANZECC water quality trigger values were only exceeded for Zn and Cu following inundation with seawater.

Table 5-24. Comparison of laboratory and field inundation results for Point Sturt (South).

Laboratory Result	Field Result
The inundation of this soil material by River Murray water induced a small reduction in the pH of the inundating waters from ~6.7 to 6.2 at day 25 followed by a slow increase to a pH of ~7.0 by day 136.	The pH of the freshwater treatment has remained around that of the supply water (7.9) with a maximum of 8.5 and a minimum of 7.3.
The inundation of this soil material by seawater induced an immediate and substantial reduction in the pH of the inundating water down to ~6.0 after 2 hours, after which the pH slowly increased by day 35 to 6.4 and decreased to ~5.0 by day 136.	The pH of the sea water treatment has remained in a narrower band of 7.5 to 8.2 with a supply sea water pH of 7.8.
Reducing conditions slowly developed in the underlying sediments inundated by both waters. The Eh of the more alkaline inundating waters (i.e. seawater) decreased to a greater extent.	Reducing conditions slowly also developed in the underlying sediments inundated by both waters.
Alkalinity in the pore-waters (especially the acidic lower pore-waters) was much lower than in the inundating waters during the initial period of inundation. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the inundation. A slight decrease in surface water alkalinity was observed over 136 days.	Alkalinity in the upper pore-waters (i.e. 0.2 and 0.5 m bgl*) was much lower than in the inundating waters. Alkalinity in the inundating seawater was higher than those of the inundating River Murray water during the inundation. The water column alkalinity was relatively stable with a small initial decrease likely due to the dissolution of surface efflorescences followed by a later increase due to evapoconcentration.
Iron mobilisation was relatively slight during the initial 25 days of inundation in the uppermost pore-waters but rapidly increased thereafter. Iron mobilisation was not observable in the inundating waters.	Iron mobilisation was not observed in the pore-waters over the timeframe iron was measured (i.e. < 50 days). Iron mobilisation was not observable in the inundating waters.
The sulfide levels were very low (below limits of detection < 30 ppb) in all of the waters tested.	Not measured in this study.
NH_3 concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and after 25 days for the seawater, respectively) but to levels below the appropriate ANZECC trigger values. The concentrations of NH_3 in the pore-waters suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.	NH_3 concentrations are below the appropriate ANZECC trigger values for both treatments. The concentrations of NH_3 in the pore-waters (0.2 m bgl*) suggest that the increase of NH_3 in the inundating waters was via upwards diffusion.
The concentrations of some of the metals in the inundation waters increased during the period of inundation, but only the concentrations of Zn and Cu (seawater inundation only) exceeded the appropriate ANZECC trigger value.	The concentrations of some of the metals in the inundation waters also increased during the period of inundation, and only the concentrations of Zn and Cu (seawater inundation only) exceeded the appropriate ANZECC trigger value.
There were marked depletions of SO_4 in the pore-waters during inundation with River Murray water.	Data not presented.
Diffusive flux rates of soluble components into the overlying waters were measured in this study.	A downward flux of the inundating waters in the field studies precludes a direct comparison of diffusive flux rates into overlying waters.

* bgl refers to 'below ground level'

6 Conclusions

- The response of the inundating waters to the underlying sediments varied considerably in terms of pH. Only four (27%) of the inundating waters over the fifteen sediments fell below a pH of 5.0 during the inundation period. Only two (14%) of the inundating waters over the fifteen sediments fell below a pH of 4.0 during the inundation period.

- Inundation by seawater generally had a greater acidification effect than did inundation by River Murray water. The results indicate that the higher alkalinity of the seawater was insufficient (under the experimental conditions) to overcome the additional exchange of acidity from the sediments caused by the higher salinity of the seawater. The mean net flux of alkalinity from the 15 sites from the sediment to the overlying River Murray water during the 35 days of inundation was 6.7 x 10^{-3} moles m^2 day^{-1} indicating a flow of alkalinity from the sampled sediments to the overlying River Murray water. In contrast, the mean net flux of alkalinity from the 15 sites from the sediment to the overlying seawater during the 35 days of inundation was -5.1 x 10^{-3} moles m^2 day^{-1} indicating an average flow of acidity from the sampled sediments to the overlying seawater.

- After 136 days of inundation the mean net flux of alkalinity from the 15 sites from the sediment to the overlying water was 2.7 x 10^{-3} moles m^2 day^{-1} indicating a flow of alkalinity from the sampled sediments to the overlying River Murray water. In contrast, the mean net flux of alkalinity from the 15 sites from the sediment to the overlying seawater during the 136 days of inundation was -1.5 x 10^{-3} moles m^2 day^{-1} indicating an average flow of acidity from the sampled sediments to the overlying seawater. These lower values indicate that the magnitude of the flows of acidity to the overlying waters (in the case of seawater inundation) and of alkalinity to the overlying waters (in the case of River Murray water inundation) tended to diminish over the 100 days of inundation from day 35.

- The Titratable Actual Acidities (TAA) of these materials were generally very low. Soil materials from only two of the fifteen sites (i.e. Sites 13 (Currency Creek) and 14 (Poltalloch)) had TAAs exceeded the value (i.e. 18 mol H^+/tonne) usually used to trigger further acid sulfate soil investigations. Many of the soil materials that had TAAs lower than this trigger value also had very low pHs indicating that even these low pH soil materials have only a poor ability to supply acidity to the overlying waters. This helps to explain the general lack of severe acidification of the waters inundating the soil materials.

- Jarosite was visibly present in three of the very acidic soil materials (Sites 8, 13 and 14). The increase in soluble K within the jarositic soil materials at two of these sites (i.e. Sites 8 and 14) during the River Murray water inundation indicates that jarosite may have been a readily available source of acidity in these materials.

- The data indicates that rather than providing a source of alkalinity to help mitigate against acidification of the waters in the lakes as had been previously discussed as a solution for acidification, that the introduction of seawater into the lakes may - especially under the proposed conditions that would result in negligible tidal exchange of seawater in the lakes - result in both greater fluxes of acidity and lower fluxes of alkalinity from inundated sediments into the inundating lake water. This would tend to enhance acidification of the waters in the lakes rather than reduce it, although this effect could be reduced or reversed depending on whether greater effective dilutions (than were used in this project) or appreciable exchanges of seawater were achieved by any adopted rewetting management practice. However, these results do not affect the possible utility of seawater to prevent oxidation and acidification of sediments other than the exposed sandy shoreline soils (i.e. the sediments at greater depth in the lake that have not yet been exposed by drying may have a greater capacity to release acidity and contaminants than the exposed sandy shoreline soils examined in these studies) should alternative sources of water be lacking.

- For most of the soil materials examined, their inundating waters essentially maintained their prior alkalinity levels over the duration of the inundation. For the remaining soil materials the alkalinity levels of the inundating waters decreased during the inundation. The alkalinity levels in the uppermost pore-waters generally increased or remained level during the incubation, although there were a few sites where the pore-waters (in the very acidic soil materials) were initially completely depleted of alkalinity during the early stages of inundation. This shows that the sediments, excepting the few very acidic soil materials, were capable of producing substantial alkalinity during the 136 days of inundation. The other data showing strong sulfate depletion in these soils strongly indicate that this alkalinity is consequent of sulfate reduction during organic matter decomposition.

- The abundant supply of sulfate in the seawater caused the sulfate concentrations of the pore-waters underlying the seawater to increase considerably during inundation. In comparison most of the pore-waters in the soil materials examined in this study when inundated with River Murray water became (or were becoming) depleted in sulfate as the inundation proceeded.

- Sulfides were generally at very low levels in the soil materials prior to inundation and had generally not accumulated measurably during the 35 days of inundation with either seawater or River Murray water. The longer term incubation of 136 days generally produced measurable sulfide mineral accumulation trends in the sediments that were in accord with the direct sulfate reduction rates measured by the $^{35}SO_4^{2-}$ incubation method.

- The data indicate that the major factor limiting sulfate reduction in these sediments over the 136 days of inundation was the availability of organic carbon in the sediments rather than the availability of sulfate in the pore waters. The organic matter contents of these surface sediments are very low with most being < 0.10% organic carbon on a gravimetric basis.

- There were clear differences in the effect of the inundating waters on the extent and rates of mobilisation of chemical species during the period of inundation. The data indicate that exceedances of especially Zn and NH_3 were much more likely in the inundating waters when those inundating waters were seawater.

- All of the inundating waters (except for those inundating the Monosulfidic Black Ooze material at site 12) exceeded the recommended water quality guidelines for Zn when seawater was used. The inundating waters for one especially acidic soil material also exceeded the recommended water quality guidelines for Zn when River Murray was used.

- The inundating waters for sites 1, 8, 10, 12, 13 and 14 exceeded the recommended water quality guidelines for NH_3 when seawater was used. The inundating waters for site 12 also exceeded the recommended water quality guidelines for NH_3 when River Murray was used.

- Iron was mobilised to varying extents from most of the soil materials into the pore-waters during inundation. However, soluble iron was rarely sampled in the inundating waters in appreciable concentrations. This was presumably due to oxidation and precipitation of any soluble iron diffusing upwards into the generally more oxic overlying waters.

- The changes in flux of many soluble constituents from the soils to the overlying waters did not usually exhibit a simple linear trend. This is likely due to the broad sweep of biogeochemical processes within sediments that are created from the progression of geochemical regimes that result from prolonged inundation. In addition some soluble constituents that appear in increasing concentrations in the inundating waters during the initial inundation phase, decrease in concentration in later inundation phases. Consequently, the apparent net diffusion rates for most soluble constituents change appreciably during the inundation.

7 Recommendations

1. The results suggest that the introduction of seawater to reinundate the exposed sandy shoreline soils, especially without appreciable exchange of those seawaters and hence a ready supply of alkalinity, is unlikely to result in a lowered acidification hazard. If anything the results of this study suggest that the introduction of seawater for that purpose and under those conditions may result in a greater acidification hazard than if River Murray water was used for this purpose. Of course, this effect could be reduced or reversed depending on whether greater effective dilutions (than were used in this project) or appreciable exchanges of seawater were achieved by any adopted rewetting management practice. Furthermore, this does not affect the possible utility of seawater to prevent oxidation and acidification of sediments other than the exposed sandy shoreline soils (i.e. the sediments at greater depth in the lake that have not yet been exposed by drying may have a greater capacity to release acidity and contaminants than the exposed sandy shoreline soils examined in these studies) should alternative sources of water be lacking.

2. It is likely that salinities other than the two tested here (i.e. River Murray water and seawater) may have produced different results in terms of fluxes of potential contaminants and acidity/alkalinity and this should receive similar testing to that undertaken in this study on a range of representative sediments.

3. There were only 15 sites examined in this study. Although these sites were carefully chosen by the Scientific Committee (based on the best advice at hand at the time of experimental design) to best represent the exposed lake sediments, the degree of representation cannot be known with certainty without a detailed and accurate map of these sediments around the lake. It is strongly recommended that an accurate map of the extent of these exposed sandy shoreline soils based on hazard (e.g. mapping separately those exposed soils with appreciable surficial reserves of TAA and jarosite as these showed a strong propensity in this study to release acidity and potential contaminants into the inundating waters) be produced to allow accurate modelling of the likely behaviour of the exposed sandy shoreline soils consequent of reinundation.

4. There remains considerable uncertainty surrounding the flux rates of potential contaminants mobilised in these sediments. In this experiment the flux rate of these components from sediment to inundating waters were due to diffusion alone. Further studies aimed determining the flux rates from sediment to both inundating waters and groundwaters due to convective processes should be given a high priority. If these processes are significant in contaminant flux in these sediments, then the pore water data in this study suggests greater contamination of overlying water would occur. Another question that such further research needs to answer is: What proportion of the Existing Acidity contained in these soils flows out of the soil in any water flush through the soil? For example: Is it all of the Actual Acidity in that soil? Or only a portion of the Actual Acidity? What proportion of Retained Acidity flows out of the soil in any water flush through the soil? Is it all of the Retained Acidity in that soil? Or only a portion of the Retained Acidity?

5. Given firstly the data indicate that the major factor limiting sulfate reduction in these sediments over the 136 days was the availability of organic carbon in the sediments rather than the availability of sulfate in the pore waters, and secondly the potential importance of sulfate reduction in relation to critical sediment/water aspects such as the development of alkalinity in the sediments, it is recommended that further investigations aimed at examining ways to enhance the organic matter contents in these sediments and the effects of such treatments on sediment behaviour be undertaken.

6. Finally, the recent data provided to the Scientific Committee advising this study shows that the clayey sediments at greater depth in the lake - that have not yet been exposed by drying - have a much greater capacity to release acidity and contaminants than the exposed sandy shoreline soils examined in these studies. Consequently in order to inform future management of these lakes it is strongly recommended that similar testing to that undertaken in this study for the sandy lake-margin sediments, be undertaken on a representative range of these as-yet-unexposed deep clayey lake sediments - after they have been air-dried. This would allow future management to be based on an adequate assessment of the likely behaviour and consequent hazards of these clayey sediments to reinundation by both River Murray water and seawater were these sediments to be exposed under a drying lake scenario.

8 References

Ahern CR, Sullivan LA, McElnea AE (2004) Laboratory methods guidelines 2004 - acid sulfate soils. In 'Queensland Acid Sulfate Soil Technical Manual'. (Department of Natural Resources, Mines and Energy: Indooroopilly, Queensland).

ANZECC/ARMCANZ (2000) 'Australian and New Zealand guidelines for fresh and marine water quality.' (Australian and New Zealand Environment and Conservation Council, Agricultural and Resource Management Council of Australia and New Zealand: Canberra).

APHA (2005) 'Standard methods for the examination of water and wastewater (21st Ed.).' (American Public Health Association - American Water Works Association: Baltimore, USA).

Berner RA (1984) Sedimentary pyrite formation: an update. *Geochimica et Cosmochimica Acta* **48**, 605-615.

van Breemen N (1976) Genesis and solution chemistry of acid sulfate soils in Thailand. PUDOC Agricultural Research Reports No. 848, Wageningen, The Netherlands.

Burton ED, Bush RT, Sullivan LA (2006a) Acid-volatile sulfide oxidation in coastal floodplain drains: iron-sulfur cycling and effects on water quality. *Environmental Science & Technology* **40**, 1217-1222.

Burton ED, Bush RT, Sullivan LA (2006b) Reduced inorganic sulfur speciation in drain sediments from acid-sulfate soil landscapes. *Environmental Science & Technology* **40**, 888-893.

Burton ED, Bush RT, Sullivan LA, Mitchell DRG (2007) Reductive transformation of iron and sulfur in schwertmannite-rich accumulations associated with acidified coastal lowlands. *Geochimica et Cosmochimica Acta* **71**, 4456 - 4473.

Burton ED, Bush RT, Sullivan LA, Johnston SG, Hocking RK (2008a) Mobility of arsenic and selected metals during re-flooding of iron- and organic-rich acid-sulfate soil. *Chemical Geology* **253**, 64-73.

Burton ED, Sullivan LA, Bush RT, Johnston SG, Keene AF (2008b) A simple and inexpensive chromium-reducible sulfur method for acid-sulfate soils. *Applied Geochemistry* **23**, 2759-2766.

Bush RT (2000) Iron sulfide micromorphology and mineralogy in acid sulfate soils: Their formation and behaviour. Unpublished Ph.D., University of NSW.

Bush RT, Sullivan LA (1997) Morphology and behaviour of greigite from a Holocene sediment in eastern Australia. *Australian Journal of Soil Research* **35**, 853-861.

Bush RT, Sullivan LA, Lin C (2000) Iron monosulfide distribution in three coastal floodplain acid sulfate soils, eastern Australia. *Pedosphere* **10**, 237-245.

Dent D (1986) 'Acid sulphate soils: a baseline for research and development.' (International Institute for Land Reclamation and Improvement ILRI, Wageningen, The Netherlands).

Farrah H, Hatton D, Pickering WF (1980) The affinity of metal ions for clay surfaces. *Chemical Geology* **28**, 55-68.

Ferguson A, Eyre B (1999) Behaviour of aluminium and iron in acid runoff from acid sulphate soils in the lower Richmond River catchment. *Journal of Australian Geology & Geophysics* **17**, 193-201.

Fitzpatrick R, Marvanek S, Shand P, Merry R, Thomas M (2008) Acid sulfate soil maps of the River Murray below Blanchetown (Lock 1) and Lakes Alexandrina and Albert when water levels were at pre- drought and current drought conditions. CSIRO Land and Water Glen Osmond, SA.

Fossing H, Ferdelman TG, Berg P (2000) Sulfate reduction and methane oxidation in continental margin sediments influenced by irrigation (South-East Atlantic off Namibia). *Geochimica et Cosmochimica Acta* **64**, 897-910.

Hicks WS, Creeper N, Hutson J, Fitzpatrick RW, Grocke S, Shand P (2009) The potential for contaminant mobilisation following acid sulfate soil rewetting: field experiment. CSIRO Land and Water.

Hindar A, Henrikson A, Torseth K, Semb A (1994) Acid water and fish death. *Nature* **372**, 327-328.

Jakobsen R, Postma D (1999) Redox zoning, rates of sulfate reduction and interactions with Fe-reduction and methanogenesis in a shallow sandy aquifer, Rømø, Denmark. *Geochimica et Cosmochimica Acta* **63**, 137-151.

Johnston S, Keene A, Bush R, Burton E, Sullivan L (2009a) Remediation of coastal acid sulfate soils by tidal inundation: Effectiveness and geochemical implications. In '18th NSW Coastal Conference.'(Ballina, NSW).

Johnston SG, Burton ED, Bush RT, Keene AF, Sullivan LA, Smith D, McElnea AE, Ahern CR, Powell B (2010a) Abundance and fractionation of Al, Fe and trace metals following tidal inundation of a tropical acid sulfate soil. *Applied Geochemistry* **25**, 323-335.

Johnston SG, Bush RT, Sullivan LA, Burton ED, Smith D, Martens MA, McElnea AE, Ahern CR, Powell B, Stephens LP, Wilbraham ST, van Heel S (2009b) Changes in water quality following tidal inundation of coastal lowland acid sulfate soil landscapes. *Estuarine, Coastal and Shelf Science* **81**, 257-266.

Johnston SG, Keene AF, Burton ED, Bush RT, Sullivan LA, McElnea AE, Ahern CR, Smith CD, Powell B, Hocking RK (2010b) Arsenic mobilisation in a seawater inundated acid sulfate soil. *Environmental Science & Technology* **44**, 1968-1973.

Johnston SG, Keene AF, Bush RT, Burton ED, Sullivan LA, Smith D, McElnea AE, Martens MA, Wilbraham S (2009c) Contemporary pedogenesis of severely degraded tropical acid sulfate soils after introduction of regular tidal inundation. *Geoderma* **149**, 335-446.

Johnston SG, Slavich PG, Hirst P (2005) Changes in surface water quality after inundation of acid sulfate soils of different vegetation cover. *Australian Journal of Soil Research* **43**, 1-12.

Keene AF, Johnston SG, Bush RT, Burton ED, Sullivan LA (2010) Reactive trace element enrichment in a highly modified, tidally inundated acid sulfate soil wetland: East Trinity, Australia. *Marine Pollution Bulletin* **60**, 620-626.

Konsten CJM, van Breemen N, Suping S, Aribawa IB, Groenenberg JE (1994) Effects of flooding on pH of rice-producing, acid sulfate soils in Indonesia. *Soil Science Society of America Journal* **58**, 871-883.

Koschorreck M, Wendt-Potthoff K, Geller W (2003) Microbial sulfate reduction at low pH in sediments of an acidic lake in Argentina. *Environmental Science and Technology* **37**, 1159–1162.

McGuire MM, Hamers RJ (2000) Extraction and quantitative analysis of elemental sulfur from sulfide mineral surfaces by high-performance liquid chromatography. *Environmental Science & Technology* **34**, 4651-4655.

Millward GE, Moore RM (1982) The adsorption of Cu, Mn and Zn by iron oxyhydroxide in model estuarine solutions. *Water Research* **16**, 981-985.

Ponnamperuma FN (1972) The chemistry of submerged soils. *Advances in Agronomy* **24**, 29-96.

Ponnamperuma FN, Attanandana T, Beye G (1973) Amelioration of three acid sulphate soils for lowland rice. In 'Proceedings of the International Symposium on acid sulphate soils, 13-20 August 1972, Wageningen, The Netherlands'. (Ed. H Dost) pp. 391-405. (International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands).

Preda M, Cox ME (2001) Trace metals in acid sediments and waters, Pimpama catchment, southeast Queensland, Australia. *Environmental Geology* **40**, 755-768.

Roden EE, Zachara JM (1996) Microbial reduction of crystalline iron(III) oxides: Influence of oxide surface area and potential for cell growth. *Environmental Science & Technology* **30**, 1618-1628.

Sammut J, Callinan RB, Fraser GC (1993) The impact of acidified water on freshwater and estuarine fish populations in acid sulphate soil environments. In 'Proceedings National Conference on Acid Sulphate Soils'. Coolangatta, NSW. 24-25 June 1993. (Ed. RT Bush) pp. 26-40. (CSIRO, NSW Agriculture, Tweed Shire Council).

Sarazin G, Michard G, Prevot F (1999) A rapid and accurate spectroscopic method for alkalinity measurements in sea water samples. *Water Resources* **33**, 290-294.

Sayles FL, Mangelsdorf Jr PC (1977) The equilibration of clay minerals with sea water: exchange reactions. *Geochimica et Cosmochimica Acta* **41**, 951-960.

Simpson S, Fitzpatrick R, Shand P, Angel B, Spadaro D, Merry R, Thomas M (2008) The acid, metal and nutrient mobilisation following rewetting of acid sulfate soils in the Lower Murray. Prepared for the South Australian Environmental Protection Agency. CSIRO Land and Water Bangor, NSW.

Stumm W, Morgan JJ (1996) 'Aquatic chemistry.' (John Wiley & Sons: New York).

Sullivan L, Burton E, Bush R, Watling K, Bush M (2008) Acid, metal and nutrient mobilisation dynamics in response to suspension of MBOs in freshwater and to freshwater inundation of dried MBO and sulfuric soil materials. Final Report. A report for "The acid, metal and nutrient mobilisation following rewetting of acid sulfate soils in the Lower Murray Project". Prepared for the South Australian Environmental Protection Agency. Centre for Acid Sulfate Soil Research, Southern Cross GeoScience, Southern Cross University, Lismore, NSW.

Sullivan LA, Bush RT (1997) Quantitative elemental microanalysis of rough-surfaced soil specimens in the scanning electron microscope using a peak-to-background method. *Soil Science* **162**, 749-757.

Sullivan LA, Bush RT (2000) The behaviour of drain sludge in acid sulfate soil areas: some implications for acidification of waterways and drain maintenance. In 'Proceedings of Workshop on Remediation and Assessment of Broadacre Acid Sulfate Soils'. (Ed. P Slavich) pp. 43-48. (Acid Sulfate Soil Management Advisory Committee (ASSMAC): Southern Cross University, Lismore).

Sullivan LA, Bush RT (2004) Iron precipitate accumulations associated with waterways in drained coastal acid sulfate landscapes of eastern Australia. *Marine and Freshwater Research* **55**, 727-736.

Sullivan LA, Bush RT, Fyfe D (2002) Acid sulfate soil drain ooze: distribution, behaviour and implications for acidification and deoxygenation of waterways. In 'Acid Sulfate Soils in Australia and China'. (Eds C Lin, MD Melville, LA Sullivan) pp. 91-99. (Science Press: Beijing).

Sundström R, Aström M, Österholm P (2002) Comparison of metal content in acid sulfate soil runoff and industrial effluents in Finland. *Environmental Science & Technology* **36**, 4269-4272.

Tessier A, Rapin F, Carignan R (1985) Trace metals in oxic lake sediments: possible adsorption onto iron oxyhydroxides. *Geochimica et Cosmochimica Acta* **49**, 183-194.

Tuong TP (1993) An overview of water management of acid sulphate soils. In 'Selected papers of the Ho Chi Minh City Symposium on Acid Sulphate Soils'. (Eds DL Dent, MEF van Mensvoort) pp. 265-279. (ILRI Publication No. 53, The International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands).

Wong VNL, Johnston SG, Burton ED, Bush RT, Sullivan LA, Slavich PG (submitted) Seawater causes rapid trace metal mobilisation in coastal lowland acid sulfate soils: implications of sea level rise for water quality. *Geoderma.*

9 Appendices

Appendix 1. Site and sample descriptions

Table 9-1. Lower Lakes site and profile descriptions.

Profile	Date	Location	GPS Co-ordinates Zone	East.	North.	Location and Profile Remarks
Site 1	12/06/09	Waltowa, Lake Albert	54	0352377	6059089	Sampling site at 52 m from former shoreline. **0-5 cm:** Brown/grey sand with dark grey crust (pH 7.80, EC 1609 µS/cm). **5-12 cm:** Grey sand with frequent large orange mottles (pH 4.86, EC 1296 µS/cm). **12-30 cm:** Grey sandy clay (pH 6.32, EC 632 µS/cm). **30-45 cm:** Dark grey light clay (pH 8.24, EC 418 µS/cm).
Site 2	12/06/09	Waltowa, Lake Albert	54	0352339	6059063	Sampling site at 112 m from former shoreline. **0-5 cm:** Pale brown sand (pH 8.79, EC 434 µS/cm). **5-10 cm:** Orange mottled pale brown sand (pH 8.32, EC 948 µS/cm). **10-20 cm**: Mottled orange & dark grey/pale brown sand. (pH 8.27, EC 1073 µS/cm). **20-45 cm:** Dark grey sand with orange mottles (pH 8.40, EC 432 µS/cm). Water table at 25 cm from surface.
Site 3	13/06/09	Meningie, Lake Albert	54	0349077	6049285	Sampling site at 44 m from former shoreline. **0-1 cm:** Orange sand crust with white surface (pH 7.48, EC 7.68 mS/cm). **1-15 cm:** White sand and dark grey clay alternating layers each ~3 cm thick (pH 7.66, EC 6.98 mS/cm). **15-27 cm:** Grey with frequent orange mottles (pH 7.74, EC 4.99 mS/cm). **27-41 cm:** Grey sand with a few orange mottles and frequent roots (pH 7.55, EC 10.70 mS/cm). **41-50 cm:** Grey sand clay (pH 7.76, EC 4.55 mS/cm). Water table at 41 cm from surface. Water that filled pit had pH 6.26 and EC 88.6 mS/cm.
Site 4	13/06/09	Meningie, Lake Albert	54	0349096	6049309	Sampling site at 85 m from former shoreline. **0-11 cm:** Pale brown sand with some orange segregations (pH 7.59, EC 2317 µS /cm). **11-15 cm:** Pale brown sand with frequent grey and orange bands (pH 6.71, EC 4.81 mS/cm). **15-40 cm:** Grey clay with roots (pH 7.52, EC 5.96 mS/cm). Water table at 30 cm from surface.

Table 9-1 (continued). Lower Lakes site and profile descriptions.

Profile	Date	Location	GPS Co-ordinates			Location and Profile Remarks
			Zone	East.	North.	
Site 5	13/06/09	Tolderol, Lake Alexandrina	54	0325277	6081731	Sampling site at 134 m from former shoreline. **0-5 cm:** Pale brown sand with abundant diffuse orange segregations (pH 5.56, EC 113 µS/cm). **5-15 cm:** Pale brown sand with occasional orange segregations (pH 5.61, EC 162 µS/cm). **15-19 cm:** Light grey/pale brown sand (pH 3.80, EC 1939 µS/cm). The boundary between these layers consists of strong orange segregations. **19-25 cm:** Grey light clay (pH 5.64, EC 1401 µS/cm). **25-40 cm:** Dark grey light medium clay (pH 6.82, EC 910 µS/cm).
Site 6	13/06/09	Tolderol, Lake Alexandrina	54	0325244	6081611	Sampling site at 266 m from former shoreline. **0-7 cm:** Pale brown sand with abundant diffuse orange segregations (pH 6.43, EC 114 µS/cm). **7-18 cm:** Pale brown sand with occasional orange segregations (pH 3.52, EC 567 µS/cm). **18-32 cm:** Light grey/pale brown sand (pH 4.03, EC 773 µS/cm). The boundary between these layers consists of strong orange segregations. **32-38 cm:** Grey light clay (pH 6.92, EC 408 µS/cm). **38-45 cm:** Dark grey light medium clay (pH 9.02, EC 158 µS/cm).
Site 7	14/06/09	Point Sturt (South), Lake Alexandrina	54	0314804	6069665	Sampling site at 124 m from former shoreline. **0-5 cm:** Pale brown sand with abundant orange segregations (pH 3.63, EC 232 µS/cm). **5-11 cm:** Light grey sand with some orange segregations (pH 3.56, EC 315 µS/cm). **11-26 cm:** Light grey and dark grey layers intermixed sand (pH 3.18, EC 1186 µS/cm). **26-41 cm:** Darker grey sandy clay and light grey sand (pH 3.17, EC 2136 µS/cm). **41-55 cm:** Darker grey sandy clay (pH 5.60, EC 1112 µS/cm).

Table 9-1 (continued). Lower Lakes site and profile descriptions.

Profile	Date	Location	GPS Co-ordinates Zone	East.	North.	Location and Profile Remarks
Site 8	14/06/09	Point Sturt (North), Lake Alexandrina	54	0321233	6070313	Sampling site at 75 m from former shoreline. **0-6 cm:** Pale brown sand with dark brown organic matter stains and frequent dark grey clay lines (pH 3.38, EC 287 µS/cm). **6-11 cm:** Pale brown sand with dark brown organic matter stains, frequent dark grey clay lines and abundant diffuse jarosite accumulations (pH 3.08, EC 683 µS/cm). **11-21 cm**: Pale brown sand with dark brown organic matter stains, frequent dark grey clay lines and common jarosite plus orange mottles (pH 3.03, EC 921 µS/cm). **21-31 cm:** Pale brown sand with dark brown organic matter stains and occasional dark grey clay lines (pH 2.72, EC 1855 µS/cm). **31-40 cm:** Grey sandy clay with some lighter banded zones (pH 2.80, EC 2012 µS/cm). **40-60 cm:** Dark grey sandy clay (pH 3.37, EC 1606 µS/cm).
Site 9	14/06/09	Point Sturt (North), Lake Alexandrina	54	0321275	6070396	Sampling site at 150 m from former shoreline. **0-11 cm:** Pale brown sand with occasional orange segregations (pH 5.72, EC 58.3 µS/cm). **11-17 cm:** Pale brown sand with frequent orange segregations (pH 6.26, EC 60.8 µS/cm). **17-27 cm:** Grey sand with occasional orange segregations (pH 6.21, EC 121 µS/cm). **27-41 cm:** Light grey sand with frequent orange segregations (pH 4.34, EC 877 µS/cm). **41-55 cm:** Grey sand (pH 5.91, EC 1728 µS/cm).
Site 10	14/06/09	Milang, Lake Alexandrina	54	0316422	6079316	Sampling site at 180 m from former shoreline. **0-4 cm:** Pale brown sand (pH 4.10, EC 1097 µS/cm). **4-11 cm:** Pale brown sand with orange segregations in a wavy pattern and an overall greenish colouration (pH 3.82, EC 876 µS/cm). **11-23 cm:** Light grey sand with dark grey layers (pH 4.78, EC 732 µS/cm). **23-40 cm:** Dark grey sand with abundant orange segregations (pH 5.85, EC 626 µS/cm).

Table 9-1 (continued). Lower Lakes site and profile descriptions.

Profile	Date	Location	GPS Co-ordinates Zone	East.	North.	Location and Profile Remarks
Site 11	14/06/09	Milang, Lake Alexandrina	54	0316516	6079244	Sampling site at 360 m from former shoreline. **0-6 cm:** Pale brown sand (pH 6.70, EC 273 µS/cm). **6-12 cm:** Sand with orange segregations and a faintly green colouration (pH 5.97, EC 561 µS/cm). **12-20 cm:** Light grey and dark grey sand lenses (pH 3.65, EC 963 µS/cm). **20-35 cm:** Dark grey sand with abundant orange segregations (pH 4.77, EC 1075 µS/cm).
Site 12	15/06/09	Ewe Island Barrage	54	0315314	6062727	Sampling site at 15 m from shoreline and inundated. **0-0.5 cm:** Olive coloured crust (pH 8.22, EC 3.42 mS/cm). **0.5-2.0 cm:** Black sandy MBO accumulation. (pH 8.44, EC 1207 µS/cm). **2-10 cm:** Grey sand (pH 8.51, EC 528 µS/cm). **10-30 cm:** Grey sand (pH 8.57, EC 1047 µS/cm).
Site 13	15/06/09	Currency Creek	54	0299488	6073858	Sampling site at 45 m from former shoreline. **0-5 cm:** Dark grey sand with occasional jarositic layers (pH 3.03, EC 2.54 mS/cm). **5-9 cm:** Light grey sand and frequent jarosite mottles (pH 3.37, EC 2.06 mS/cm). **9-35 cm:** Grey light clay with abundant jarosite around root holes (pH 3.16, EC 2.13 mS/cm). **35-50 cm:** Dark grey clay (pH 5.35, EC 1.49 mS/cm).

Table 9-1 (continued). Lower Lakes site and profile descriptions.

Profile	Date	Location	GPS Co-ordinates Zone	East.	North.	Location and Profile Remarks
Site 14	16/06/09	Poltalloch Station, Lake Alexandrina	54	0342724	6071525	Sampling site at 74 m from former shoreline. **0-6 cm:** Pale brown sand with dark brown organic matter fragments and occasional diffuse yellow jarosite accumulations. (pH 3.55, EC 571 µS/cm). **6-14 cm:** Pale brown sand (slightly darker colour than layer above) with dark brown organic matter fragments (pH 3.28, EC 1423 µS/cm). **14-25 cm:** Pale brown sand with common jarosite accumulations (pH 3.05, EC 2156 µS/cm). **25-31 cm:** Dark grey sandy clay layer with orange segregations (pH 3.09, EC 1390 µS/cm). **31-42 cm:** Pale brown sand with jarosite and orange mottles (pH 3.15, EC 2405 µS/cm). **42-60 cm:** Grey sand with dark brown organic matter fragments (pH 4.34, EC 2680 µS/cm).
Site 15	16/06/09	Poltalloch Station, Lake Alexandrina	54	0342703	6071579	Sampling site at 136 m from former shoreline. **0-6 cm:** Pale brown sand with abundant orange iron segregations (pH 7.01, EC 1438 µS/cm). **6-14 cm:** Pale brown sand with very abundant large orange segregations having a wavy pattern (pH 6.99, EC 2040 µS/cm). **14-24 cm:** Light grey clay with some black zones (pH 7.14, EC 1801 µS/cm). **24-29 cm:** Very dark black sandy clay with abundant shell material (pH 8.11, EC 1302 µS/cm). **29-45 cm:** Grey sand (pH 8.15, EC 874 µS/cm).

Appendix 2. Field soil data used to determine the representative soil profiles at each site in the Lower Lakes study.

Table 9-2. EC and pH data used to determine the location of the representative soil at Site 1.

	A	B	C	D	E
1	4.31 (1340)	4.51 (626)	6.57 (1915)	4.72 (587)	6.37 (1250)
2	4.34 (1262)	6.82 (1076)	5.11 (1221)	5.76 (592)	6.52 (569)
3	**6.03 (1173)**	6.82 (861)	6.05 (790)	6.26 (580)	6.74 (1432)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-3. EC and pH data used to determine the location of the representative soil at Site 2.

	A	B	C	D	E
1	6.26 (694)	**8.40 (869)**	8.40 (719)	8.46 (1177)	8.46 (1038)
2	8.16 (1871)	8.34 (861)	8.34 (846)	8.56 (755)	8.41 (748)
3	8.33 (1096)	8.41 (1107)	8.20 (596)	8.47 (968)	8.41 (738)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-4. EC and pH data used to determine the location of the representative soil at Site 3.

	A	B	C	D	E
1	7.42 (9.56)	7.74 (5.48)	7.78 (5.27)	7.85 (3.19)	8.08 (2.34)
2	7.69 (5.14)	7.78 (4.00)	7.71 (7.40)	**7.84 (5.05)**	8.06 (2.94)
3	7.83 (4.20)	7.89 (2.84)	7.89 (5.94)	7.91 (4.18)	8.01 (3.22)

Note: EC data is in brackets (mS/cm). The representative site sampled in this study is shown in red font.

Table 9-5. EC and pH data used to determine the location of the representative soil at Site 4.

	A	B	C	D	E
1	**6.39 (1447)**	6.22 (1665)	6.28 (1752)	6.61 (1025)	5.83 (447)
2	6.24 (2710)	6.23 (2198)	6.62 (1321)	6.62 (972)	5.63 (1795)
3	6.34 (2860)	6.39 (791)	6.61 (1249)	6.45 (1131)	6.00 (1137)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-6. EC and pH data used to determine the location of the representative soil at Site 5.

	A	B	C	D	E
1	5.46 (186)	5.91 (120)	5.90 (227)	6.03 (459)	7.50 (97)
2	4.29 (154)	5.83 (135)	**6.11 (184)**	6.65 (185)	7.31 (149)
3	5.13 (449)	5.88 (183)	6.08 (225)	7.29 (505)	7.12 (162)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-7. EC and pH data used to determine the location of the representative soil at Site 6.

	A	B	C	D	E
1	4.44 (207)	4.20 (80.6)	4.26 (116)	4.10 (178)	4.30 (155)
2	4.86 (575)	4.07 (120.4)	**4.20 (150)**	4.23 (126)	4.48 (140)
3	3.79 (247)	3.98 (269)	5.45 (186)	5.14 (206)	4.66 (123)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-8. EC and pH data used to determine the location of the representative soil at Site 7.

	A	B	C	D	E
1	3.45 (410)	3.40 (754)	3.45 (513)	3.56 (620)	3.34 (780)
2	3.32 (599)	3.40 (791)	3.33 (812)	3.36 (845)	339 (813)
3	3.40 (650)	3.18 (1253)	3.51 (511)	**3.40 (690)**	3.41 (729)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-9. EC and pH data used to determine the location of the representative soil at Site 8.

	A	B	C	D	E
1	3.57 (406)	3.63 (361)	3.52 (457)	**3.68 (366)**	3.71 (288)
2	3.85 (225)	3.79 (203)	3.79 (252)	3.52 (594)	3.68 (372)
3	3.79 (185)	3.45 (598)	3.39 (698)	3.39 (707)	3.86 (186)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-10. EC and pH data used to determine the location of the representative soil at Site 9.

	A	B	C	D	E
1	7.01 (33.0)	7.16 (22.8)	7.48 (20.0)	7.29 (40.0)	8.10 (23.6)
2	7.12 (24.2)	7.33 (14.9)	**7.30 (37.3)**	8.18 (52.3)	8.13 (22.0)
3	7.26 (10.1)	7.16 (40.3)	7.58 (12.5)	8.21 (22.7)	8.03 (21.1)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-11. EC and pH data used to determine the location of the representative soil at Site 10.

	A	B	C	D	E
1	5.63 (381)	4.37 (350)	4.11 (596)	4.50 (389)	**4.24 (470)**
2	5.04 (580)	3.98 (515)	3.86 (583)	3.95 (792)	5.81 (424)
3	3.92 (982)	4.16 (362)	4.85 (1720)	4.73 (911)	5.74 (797)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-12. EC and pH data used to determine the location of the representative soil at Site 11.

	A	B	C	D	E
1	6.79 (319)	6.68 (877)	7.09 (313)	4.77 (1064)	5.36 (351)
2	**6.74 (606)**	6.88 (408)	7.00 (587)	4.81 (731)	4.20 (583)
3	6.74 (552)	6.91 (532)	6.98 (719)	4.27 (1192)	5.22 (1331)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-13. EC and pH data used to determine the location of the representative soil at Site 12.

	A	B	C	D	E
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-

Note: EC and pH data was not used to determine the representative location at the MBO site.

Table 9-14. EC and pH data used to determine the location of the representative soil at Site 13.

	A	B	C	D	E
1	3.48 (1190)	3.39 (1751)	3.39 (1118)	3.52 (1246)	3.46 (1223)
2	3.16 (2094)	**3.21 (2022)**	3.49 (1338)	3.26 (1664)	3.17 (1809)
3	3.08 (2649)	3.07 (3520)	3.07 (4100)	3.18 (2930)	2.95 (2900)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-15. EC and pH data used to determine the location of the representative soil at Site 14.

	A	B	C	D	E
1	3.21 (3200)	2.93 (2335)	3.06 (2507)	3.03 (1135)	3.63 (1718)
2	2.82 (1770)	3.00 (1257)	2.90 (2246)	3.55 (934)	3.02 (1279)
3	3.17 (899)	2.91 (1412)	**2.93 (1565)**	2.78 (2325)	2.89 (2072)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Table 9-16. EC and pH data used to determine the location of the representative soil at Site 15.

	A	B	C	D	E
1	7.19 (1045)	7.30 (1155)	6.86 (7.21)	7.42 (1156)	7.64 (2339)
2	7.32 (701)	7.39 (1033)	7.45 (463)	7.50 (937)	7.91 (762)
3	**7.40 (827)**	7.53 (373)	7.43 (1763)	8.05 (605)	7.91 (741)

Note: EC data is in brackets (µS/cm). The representative site sampled in this study is shown in red font.

Appendix 3. Sediment characteristics

Table 9-17. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.003	0.002	<0.001	-	0.007	0.006	<0.001	-	0.001	-	<0.001	-
	4-8	0.004	<0.001	<0.001	-	0.001	0.001	<0.001	-	<0.001	-	0.001	<0.001
	8-15	0.005	<0.001	0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	<0.001
Seawater	0-4	0.003	0.002	0.002	-	0.003	0.002	<0.001	-	0.002	0.002	0.003	0.005
	4-8	0.004	<0.001	0.001	-	0.004	0.001	<0.001	-	<0.001	-	0.001	<0.001
	8-15	0.005	<0.001	0.001	-	0.001	0.001	<0.001	-	<0.001	-	0.002	0.001

Table 9-18. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	0.005	0.001	0.944	0.146	0.801	0.527	0.319	0.035
	4-8	<0.001	-	<0.001	-	0.005	<0.001	1.040	0.196	0.604	0.069	0.438	0.036
	8-15	<0.001	-	<0.001	-	0.003	0.001	1.219	0.121	2.864	0.190	0.700	0.027
Seawater	0-4	<0.001	-	<0.001	-	0.003	0.004	0.944	0.146	6.109	0.786	4.111	0.558
	4-8	<0.001	-	<0.001	-	0.002	0.001	1.040	0.196	5.353	0.380	3.549	1.394
	8-15	<0.001	-	<0.001	-	0.001	<0.001	1.219	0.121	5.552	0.019	3.851	1.461

Table 9-19. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): TAA and ANC.

		TAA (mol H^+/t)						ANC (% $CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.87	1.75	0.00	-	0.11	0.01	0.14	0.11	0.00	-
	4-8	0.47	0.94	2.56	0.42	0.91	1.81	0.05	0.04	0.13	0.09	0.00	-
	8-15	2.36	1.89	4.23	1.39	1.83	0.61	0.03	0.05	0.12	0.04	0.00	-
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.11	0.01	0.05	0.05	0.03	0.04
	4-8	0.47	0.94	0.00	-	0.00	-	0.05	0.04	0.03	0.06	0.04	0.08
	8-15	2.36	1.89	0.00	-	0.00	-	0.03	0.05	0.08	0.10	0.03	0.06

Table 9-20. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.17	0.02	0.22	0.01	0.18	0.06	0.09	<0.01	0.12	<0.01	0.09	<0.01
	4-8	0.13	<0.01	0.17	0.02	0.13	<0.01	0.07	0.02	0.07	0.02	0.07	0.03
	8-15	0.18	0.10	0.20	0.03	0.13	0.04	0.12	0.11	0.12	0.06	0.09	0.03
Seawater	0-4	0.17	0.02	0.21	0.03	0.16	0.03	0.09	<0.01	0.12	0.01	0.10	0.02
	4-8	0.13	<0.01	0.21	0.03	0.13	<0.01	0.07	0.02	0.11	0.03	0.11	0.02
	8-15	0.18	0.10	0.19	0.01	0.13	0.01	0.12	0.11	0.12	0.02	0.10	0.03

Table 9-21. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.04	0.02	0.01	<0.01	0.02	0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01
	4-8	0.03	0.01	0.01	<0.01	0.02	<0.01	0.03	0.01	0.03	0.01	0.02	<0.01
	8-15	0.04	0.02	0.02	0.01	0.02	<0.01	0.03	0.01	0.04	0.01	0.02	<0.01
Seawater	0-4	0.04	0.02	0.03	0.01	0.01	<0.01	0.02	<0.01	0.03	<0.01	0.04	0.02
	4-8	0.03	0.01	0.02	<0.01	0.01	<0.01	0.03	0.01	0.03	<0.01	0.03	<0.01
	8-15	0.04	0.02	0.02	<0.01	0.01	<0.01	0.03	0.01	0.03	<0.01	0.03	0.01

Table 9-22. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	684	111	344	15	168	17	48.6	5.6	44.7	2.6	22.3	1.4
	4-8	702	59	715	54	256	35	42.8	2.7	45.6	4.9	17.5	0.3
	8-15	864	59	1089	126	405	12	52.5	1.6	63.9	9.1	24.5	1.5
Seawater	0-4	684	111	2478	268	3131	505	48.6	5.6	143.9	4.7	156.5	39.1
	4-8	702	59	2143	270	2696	1105	42.8	2.7	115.3	0.6	128.2	27.6
	8-15	864	59	2261	9	3047	985	52.5	1.6	107.0	0.6	131.7	27.3

Table 9-23. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	108.7	6.5	75.9	8.4	35.0	3.5	90.7	11.3	55.2	0.7	24.6	1.0
	4-8	87.9	21.3	76.5	0.5	31.5	4.8	109.1	21.6	117.6	16.4	38.7	1.4
	8-15	108.0	13.2	101.4	0.9	42.2	6.9	141.4	16.0	171.2	22.2	67.9	0.7
Seawater	0-4	108.7	6.5	162.1	0.6	155.2	45.3	90.7	11.3	258.4	8.6	351.5	84.7
	4-8	87.9	21.3	118.9	8.0	115.8	61.3	109.1	21.6	252.0	35.5	309.3	93.4
	8-15	108.0	13.2	106.4	13.7	102.8	34.5	141.4	16.0	245.2	20.9	322.8	95.8

Table 9-24. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	965	210	468	28	253	14	496	43	317	54	157	4
	4-8	1053	71	1034	93	391	27	565	155	700	28	209	11
	8-15	1199	40	1598	218	607	2	841	218	1016	14	382	23
Seawater	0-4	965	210	4202	532	5952	1361	496	43	854	72	941	265
	4-8	1053	71	3605	404	4908	2213	565	155	769	96	814	362
	8-15	1199	40	3700	18	5471	2117	841	218	823	34	845	281

Table 9-25. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1037	*62*	1453	*301*	881	*348*	1230	*54*	1887	*109*	1535	*482*
	4-8	841	*14*	1027	*87*	624	*41*	1127	*178*	1222	*36*	1110	*156*
	8-15	1385	*435*	1582	*173*	920	*122*	1390	*482*	1552	*133*	1245	*180*
Seawater	0-4	1037	*62*	1139	*90*	879	*133*	1230	*54*	1455	*108*	1522	*326*
	4-8	841	*14*	964	*77*	713	*95*	1127	*178*	1251	*3*	1118	*69*
	8-15	1385	*435*	1455	*36*	920	*139*	1390	*482*	1501	*43*	1097	*155*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-26. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	22.0	*1.5*	20.8	*1.0*	21.2	*5.9*	0.81	*0.02*	0.73	*0.13*	0.76	*0.04*
	4-8	15.8	*0.2*	11.5	*3.7*	13.3	*1.7*	0.64	*0.24*	0.43	*0.18*	0.39	*0.17*
	8-15	12.8	*1.6*	12.4	*3.8*	11.3	*4.8*	0.78	*0.07*	0.66	*0.13*	0.52	*0.43*
Seawater	0-4	22.0	*1.5*	24.8	*7.9*	39.2	*24.5*	0.81	*0.02*	0.53	*0.07*	0.62	*0.14*
	4-8	15.8	*0.2*	11.4	*0.1*	10.1	*<0.1*	0.64	*0.24*	0.61	*0.11*	0.24	*0.16*
	8-15	12.8	*1.6*	13.2	*0.8*	7.1	*1.9*	0.78	*0.07*	0.79	*0.05*	0.32	*0.36*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-27. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.61	*0.42*	1.94	*0.05*	1.75	*0.69*	1.47	*0.14*	2.29	-	1.75	*0.62*
	4-8	1.53	*0.16*	1.37	*0.23*	1.37	*0.15*	9.60	*1.52*	3.54	*0.98*	1.04	*0.03*
	8-15	2.44	*1.07*	1.91	*0.23*	2.19	*0.53*	5.62	*2.88*	2.51	*0.57*	0.88	*0.10*
Seawater	0-4	1.61	*0.42*	1.36	*0.18*	1.29	*0.16*	1.47	*0.14*	1.25	*0.21*	2.07	*0.46*
	4-8	1.53	*0.16*	1.46	*0.23*	1.41	*0.47*	9.60	*1.52*	1.15	*0.19*	10.26	*2.12*
	8-15	2.44	*1.07*	1.81	*0.33*	1.36	*0.22*	5.62	*2.88*	1.14	*0.11*	1.85	*0.41*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-28. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	4.20	*0.11*	3.01	*0.70*	2.81	*1.03*	<0.01	-	0.03	*0.02*	0.02	*0.02*
	4-8	4.86	*0.84*	1.72	*0.37*	2.06	*0.02*	<0.01	-	0.02	*<0.01*	0.01	*0.01*
	8-15	5.62	*1.17*	2.53	*0.58*	2.51	*0.19*	<0.01	-	0.02	*0.01*	0.01	*0.00*
Seawater	0-4	4.20	*0.11*	2.62	*0.27*	3.08	*0.72*	<0.01	-	0.02	*<0.01*	0.01	*0.01*
	4-8	4.86	*0.84*	2.22	*0.34*	2.83	*0.49*	<0.01	-	0.06	*0.08*	0.00	*0.00*
	8-15	5.62	*1.17*	2.72	*0.23*	5.49	*3.19*	<0.01	-	0.02	*0.01*	0.01	*0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-29. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.70	*0.01*	1.10	*0.27*	1.29	*0.61*	2.95	*1.37*	5.87	-	2.17	*0.33*
	4-8	0.68	*0.17*	0.50	*0.05*	0.64	*0.26*	4.62	*0.02*	7.22	*0.95*	1.98	*0.09*
	8-15	0.59	*0.20*	0.58	*0.22*	0.46	*0.15*	5.47	-	4.36	*1.60*	2.43	*0.03*
Seawater	0-4	0.70	*0.01*	0.88	*0.08*	0.96	*0.47*	2.95	*1.37*	2.30	*0.38*	2.87	*0.36*
	4-8	0.68	*0.17*	0.80	*0.20*	0.73	*0.17*	4.62	*0.02*	2.05	*0.30*	3.54	*1.58*
	8-15	0.59	*0.20*	0.67	*0.03*	0.49	*0.02*	5.47	-	2.61	*0.41*	3.40	*1.28*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-30. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.63	*0.21*	1.81	*0.61*	1.47	*0.41*
	4-8	1.44	*0.29*	1.44	*0.31*	1.18	*0.16*
	8-15	1.74	*0.21*	1.65	*0.04*	1.79	*0.95*
Seawater	0-4	1.63	*0.21*	1.52	*0.16*	1.37	*0.13*
	4-8	1.44	*0.29*	1.48	*0.32*	1.39	*0.49*
	8-15	1.74	*0.21*	1.56	*0.12*	1.47	*0.55*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-31. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	137	*22*	146	*6*	73	*35*	204	*17*	332	*21*	369	*99*
	4-8	113	*17*	122	*11*	45	*3*	253	*198*	280	*12*	245	*42*
	8-15	153	*13*	174	*15*	64	*5*	407	*126*	378	*38*	258	*46*
Seawater	0-4	137	*22*	250	*8*	49	*7*	204	*17*	557	*9*	412	*107*
	4-8	113	*17*	207	*23*	38	*2*	253	*198*	368	*16*	150	*32*
	8-15	153	*13*	281	*14*	39	*3*	407	*126*	450	*55*	178	*5*

Table 9-32. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	14.1	*0.8*	11.1	*0.5*	12.5	*3.7*	0.31	*0.01*	0.40	*0.01*	0.33	*0.06*
	4-8	8.1	*0.1*	6.7	*3.4*	6.4	*0.8*	0.28	*0.09*	0.39	*0.12*	0.19	*0.02*
	8-15	6.0	*<0.1*	7.7	*4.2*	6.4	*1.8*	0.65	*0.26*	0.68	*0.04*	0.44	*0.08*
Seawater	0-4	14.1	*0.8*	19.8	*3.7*	24.8	*18.1*	0.31	*0.01*	0.48	*0.03*	0.46	*0.08*
	4-8	8.1	*0.1*	5.8	*0.2*	2.8	*1.2*	0.28	*0.09*	0.38	*0.01*	0.20	*0.06*
	8-15	6.0	*<0.1*	8.4	*2.9*	2.7	*1.0*	0.65	*0.26*	0.70	*0.21*	0.39	*0.05*

Table 9-33. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.80	*0.31*	1.13	*0.20*	0.95	*0.47*	0.45	*0.03*	0.80	*0.05*	0.76	*0.34*
	4-8	0.63	*0.02*	0.91	*0.17*	0.66	*0.11*	0.27	*0.13*	0.44	*0.03*	0.28	*0.08*
	8-15	1.03	*0.49*	1.26	*0.33*	1.26	*0.50*	0.20	*0.03*	0.75	*0.59*	0.22	*0.07*
Seawater	0-4	0.80	*0.31*	0.94	*0.01*	0.60	*0.05*	0.45	*0.03*	0.77	*0.04*	0.47	*0.23*
	4-8	0.63	*0.02*	0.86	*0.09*	0.63	*0.26*	0.27	*0.13*	0.68	*0.07*	0.30	*0.14*
	8-15	1.03	*0.49*	1.20	*<0.01*	0.73	*0.12*	0.20	*0.03*	0.56	*0.17*	0.32	*0.12*

Table 9-34. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.66	*1.16*	0.87	*0.05*	0.94	*0.46*	<0.01	-	<0.01	-	0.01	*<0.01*
	4-8	1.09	*0.08*	0.56	*0.06*	0.42	*0.03*	<0.01	-	<0.01	-	<0.01	-
	8-15	1.06	*0.13*	0.77	*0.29*	0.59	*0.01*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	1.66	*1.16*	1.02	*0.08*	0.63	*0.19*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	1.09	*0.08*	0.74	*0.04*	0.45	*0.04*	<0.01	-	0.01	*<0.01*	<0.01	-
	8-15	1.06	*0.13*	0.89	*0.07*	0.32	*0.04*	<0.01	-	0.01	*<0.01*	<0.01	-

Table 9-35. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.31	*<0.01*	0.51	*0.10*	0.68	*0.40*	0.17	*0.02*	0.44	*0.11*	0.23	*<0.01*
	4-8	0.23	*0.17*	0.19	*0.05*	0.23	*0.08*	0.22	*0.05*	0.39	*0.02*	0.22	*0.01*
	8-15	0.15	*0.01*	0.25	*0.18*	0.15	*0.06*	0.21	*0.05*	0.49	*0.06*	0.25	*0.03*
Seawater	0-4	0.31	*<0.01*	0.57	*0.02*	0.44	*0.32*	0.17	*0.02*	0.39	*0.10*	0.13	*0.01*
	4-8	0.23	*0.17*	0.38	*0.06*	0.23	*0.16*	0.22	*0.05*	0.49	*0.17*	0.12	*0.01*
	8-15	0.15	*0.01*	0.37	*0.11*	0.18	*0.03*	0.21	*0.05*	0.32	*0.27*	0.13	*0.01*

Table 9-36. Selected sediment properties before and after inundation of the Waltowa soil material (Site 1): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.68	*0.04*	0.76	*0.02*	0.74	*0.26*
	4-8	0.55	*0.03*	0.64	*0.04*	0.58	*<0.01*
	8-15	0.86	*0.14*	0.77	*0.14*	0.83	*0.26*
Seawater	0-4	0.68	*0.04*	0.88	*0.10*	0.68	*0.09*
	4-8	0.55	*0.03*	0.83	*0.04*	0.56	*0.05*
	8-15	0.86	*0.14*	0.94	*0.05*	0.87	*0.34*

Table 9-37. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.004	*<0.001*	0.002	-	0.001	*0.001*	<0.001	-	<0.001	-	0.001	*<0.001*
	4-8	0.005	*0.001*	0.001	-	0.001	*0.001*	<0.001	-	<0.001	-	<0.001	-
	8-15	0.005	*0.001*	0.002	-	0.001	*0.002*	<0.001	-	<0.001	-	0.001	*0.001*
Seawater	0-4	0.004	*<0.001*	0.002	-	0.002	*0.001*	<0.001	-	0.001	*0.001*	0.001	*0.001*
	4-8	0.005	*0.001*	0.001	-	0.001	*0.002*	<0.001	-	<0.001	-	0.001	*<0.001*
	8-15	0.005	*0.001*	0.002	-	0.003	*0.001*	<0.001	-	<0.001	-	0.001	*0.001*

Table 9-38. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	<0.001	-	0.666	*0.048*	0.584	*0.098*	0.187	*0.063*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.655	*0.059*	0.964	*0.332*	0.242	*0.147*
	8-15	<0.001	-	<0.001	-	0.001	*0.001*	0.805	*0.117*	1.278	*0.209*	0.241	*0.134*
Seawater	0-4	<0.001	-	<0.001	-	<0.001	-	0.666	*0.048*	6.502	*0.000*	3.926	*0.107*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.655	*0.059*	5.600	*0.422*	3.685	*0.148*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.805	*0.117*	5.351	*0.115*	3.263	*0.385*

Table 9-39. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.00	-	0.00	-	0.13	*0.09*	0.30	*0.26*	0.00	-
	4-8	0.00	-	1.39	*0.19*	0.00	-	0.08	*0.02*	0.15	*0.07*	0.00	-
	8-15	0.00	-	0.93	*1.86*	0.00	-	0.14	*0.03*	0.16	*0.04*	0.00	-
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.13	*0.09*	0.22	*0.11*	0.04	*0.08*
	4-8	0.00	-	0.00	-	0.00	-	0.08	*0.02*	0.32	*0.35*	0.01	*0.02*
	8-15	0.00	-	0.00	-	0.00	-	0.14	*0.03*	0.15	*0.03*	0.05	*0.05*

Table 9-40. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.11	*0.01*	0.16	*<0.01*	0.09	*0.03*	0.04	*0.02*	0.06	*0.01*	0.02	*0.01*
	4-8	0.09	*<0.01*	0.15	*0.05*	0.08	*0.01*	0.06	*0.06*	0.06	*0.02*	0.02	*0.04*
	8-15	0.11	*<0.01*	0.13	*0.01*	0.09	*<0.01*	0.07	*0.03*	0.05	*0.02*	0.02	*0.03*
Seawater	0-4	0.11	*0.01*	0.17	*0.02*	0.09	*<0.01*	0.04	*0.02*	0.11	*0.01*	0.06	*<0.01*
	4-8	0.09	*<0.01*	0.13	*0.01*	0.07	*0.01*	0.06	*0.06*	0.08	*0.02*	0.04	*0.05*
	8-15	0.11	*<0.01*	0.13	*0.01*	0.08	*<0.01*	0.07	*0.03*	0.10	*0.01*	0.06	*<0.01*

Table 9-41. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
	4-8	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
	8-15	0.02	<0.01	0.01	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Seawater	0-4	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.03	<0.01	0.03	0.02
	4-8	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.03	<0.01	0.02	<0.01
	8-15	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.03	<0.01	0.02	<0.01

Table 9-42. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	495	18	189	35	91	43	42.9	1.0	38.0	0.6	12.8	0.3
	4-8	530	109	405	164	143	106	40.2	1.4	46.4	8.1	15.4	2.1
	8-15	683	47	522	83	154	104	44.5	3.6	46.8	0.5	17.5	2.4
Seawater	0-4	495	18	2624	10	2971	276	42.9	1.0	133.4	6.4	129.8	4.2
	4-8	530	109	2369	112	2817	24	40.2	1.4	110.2	1.4	111.2	1.3
	8-15	683	47	2158	109	2598	326	44.5	3.6	111.3	5.5	103.4	3.0

Table 9-43. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	44.7	5.6	44.6	2.3	28.2	5.9	42.1	3.9	29.1	1.2	15.3	0.3
	4-8	17.4	5.1	17.7	3.1	14.5	0.1	28.7	6.3	35.4	8.4	17.8	1.9
	8-15	44.2	11.2	31.2	1.7	13.3	4.6	41.3	5.5	41.0	3.8	17.7	3.9
Seawater	0-4	44.7	5.6	185.4	24.9	149.7	23.0	42.1	3.9	275.8	4.9	320.6	2.1
	4-8	17.4	5.1	95.5	0.3	98.2	4.0	28.7	6.3	245.8	4.1	293.5	6.5
	8-15	44.2	11.2	117.5	38.4	94.2	17.8	41.3	5.5	223.9	17.0	238.2	8.9

Table 9-44. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	696	68	257	60	142	65	149	16	91	1	27	24
	4-8	774	156	568	234	218	160	146	26	129	29	43	39
	8-15	987	124	760	140	214	150	192	<1	183	15	50	46
Seawater	0-4	696	68	4636	56	5462	315	149	16	826	30	813	14
	4-8	774	156	3919	226	5082	117	146	26	726	18	743	63
	8-15	987	124	3671	314	4422	645	192	<1	703	30	642	93

Table 9-45. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1128	137	1309	24	719	146	1369	194	1766	15	1559	374
	4-8	1552	141	1526	70	823	29	1695	90	1877	62	1435	72
	8-15	1654	3	1546	310	931	71	2101	156	2131	275	1783	113
Seawater	0-4	1128	137	1180	57	793	102	1369	194	1690	3	1371	188
	4-8	1552	141	1386	319	944	117	1695	90	1768	383	1364	202
	8-15	1654	3	1437	112	1078	116	2101	156	1950	139	1837	121

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-46. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	8.9	*1.2*	11.5	*3.4*	10.3	*0.7*	0.91	*0.24*	0.82	*0.28*	0.89	*0.03*
	4-8	17.4	*14.6*	18.1	*6.6*	14.6	*1.4*	0.60	*0.15*	0.70	*0.27*	0.31	*0.61*
	8-15	20.8	*8.3*	19.5	*2.3*	20.4	*4.4*	0.85	*0.33*	0.80	*0.19*	0.38	*0.05*
Seawater	0-4	8.9	*1.2*	18.2	*0.0*	17.6	*3.7*	0.91	*0.24*	0.90	*<0.01*	0.81	*0.27*
	4-8	17.4	*14.6*	15.9	*2.3*	10.8	*3.9*	0.60	*0.15*	0.97	*0.07*	0.44	*0.03*
	8-15	20.8	*8.3*	16.8	*1.3*	13.6	*2.2*	0.85	*0.33*	0.93	*0.08*	0.73	*0.09*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-47. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.44	*0.26*	1.34	*0.32*	1.57	*0.33*	0.84	*0.09*	7.37	*9.17*	3.11	*4.25*
	4-8	1.84	*0.17*	1.50	*<0.01*	1.60	*0.37*	7.03	*10.87*	4.93	*4.54*	0.83	*0.04*
	8-15	2.00	*0.41*	1.48	*0.08*	1.80	*0.65*	2.13	*0.55*	2.07	*0.19*	1.36	*0.16*
Seawater	0-4	1.44	*0.26*	1.21	*0.09*	1.04	*0.24*	0.84	*0.09*	0.86	*0.05*	1.25	*0.19*
	4-8	1.84	*0.17*	1.46	*0.01*	1.23	*0.12*	7.03	*10.87*	1.11	*0.21*	2.63	*1.55*
	8-15	2.00	*0.41*	1.53	*0.13*	1.42	*0.05*	2.13	*0.55*	1.31	*0.05*	2.70	*1.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-48. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	4.07	*0.26*	2.64	*0.12*	2.90	*0.76*	<0.01	-	0.01	*<0.01*	0.01	*<0.01*
	4-8	5.11	*0.65*	2.91	*0.25*	2.39	*0.12*	<0.01	-	0.02	*0.01*	0.02	*0.03*
	8-15	4.97	*0.36*	2.73	*0.06*	2.85	*0.10*	<0.01	-	0.02	*0.01*	0.01	*0.01*
Seawater	0-4	4.07	*0.26*	2.35	*0.26*	2.61	*0.78*	<0.01	-	0.02	*<0.01*	0.01	*0.01*
	4-8	5.11	*0.65*	2.79	*0.88*	6.96	*9.16*	<0.01	-	0.04	*0.05*	<0.01	-
	8-15	4.97	*0.36*	2.75	*0.16*	2.84	*0.27*	<0.01	-	0.02	*<0.01*	0.01	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-49. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.37	*0.02*	0.48	*0.10*	0.38	*0.01*	2.29	*0.17*	6.91	*4.79*	3.32	*2.10*
	4-8	0.71	*0.15*	0.80	*0.26*	0.56	*0.14*	7.28	*8.05*	7.88	*9.02*	2.17	*0.12*
	8-15	1.00	*0.06*	0.96	*0.13*	1.00	*0.18*	3.87	*1.45*	3.13	*0.17*	2.43	*0.14*
Seawater	0-4	0.37	*0.02*	0.48	*0.04*	0.43	*0.02*	2.29	*0.17*	2.24	*0.29*	3.28	*1.20*
	4-8	0.71	*0.15*	0.79	*0.18*	0.61	*0.03*	7.28	*8.05*	2.56	*0.25*	3.78	*0.15*
	8-15	1.00	*0.06*	0.97	*0.04*	0.88	*0.04*	3.87	*1.45*	2.60	*0.02*	3.91	*0.44*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-50. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.84	*0.20*	2.08	*0.30*	1.64	*0.14*
	4-8	2.20	*0.38*	2.38	*0.36*	1.82	*0.14*
	8-15	2.31	*0.02*	2.20	*0.15*	2.49	*0.45*
Seawater	0-4	1.84	*0.20*	1.76	*0.01*	1.56	*0.11*
	4-8	2.20	*0.38*	2.10	*0.12*	1.95	*0.00*
	8-15	2.31	*0.02*	2.14	*0.11*	1.96	*0.04*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-51. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	142	*1*	156	*17*	42	*4*	451	*116*	530	*25*	329	*12*
	4-8	192	*10*	187	*16*	65	*23*	508	*35*	492	*33*	365	*10*
	8-15	194	*5*	198	*37*	67	*1*	673	*167*	696	*86*	484	*63*
Seawater	0-4	142	*1*	199	*11*	44	*5*	451	*116*	569	*46*	402	*26*
	4-8	192	*10*	289	*5*	67	*16*	508	*35*	647	*18*	464	*142*
	8-15	194	*5*	292	*61*	57	*12*	673	*167*	786	*75*	619	*120*

Table 9-52. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.9	*1.9*	6.0	*2.1*	4.4	*0.9*	0.61	*0.11*	0.67	*<0.01*	0.40	*0.10*
	4-8	9.7	*13.5*	12.4	*6.6*	8.1	*2.0*	0.59	*0.09*	0.58	*0.05*	0.37	*0.03*
	8-15	12.7	*6.8*	14.8	*1.8*	12.0	*2.5*	0.60	*0.06*	0.62	*0.07*	0.39	*0.04*
Seawater	0-4	3.9	*1.9*	12.0	*0.9*	10.6	*1.9*	0.61	*0.11*	0.63	*0.14*	0.55	*0.03*
	4-8	9.7	*13.5*	10.3	*0.2*	5.7	*3.1*	0.59	*0.09*	0.58	*0.08*	0.47	*0.13*
	8-15	12.7	*6.8*	12.3	*2.4*	7.1	*1.7*	0.60	*0.06*	0.61	*0.03*	0.56	*0.12*

Table 9-53. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.64	*0.05*	0.75	*0.04*	0.57	*0.31*	0.15	*0.03*	0.50	*0.13*	0.11	*0.06*
	4-8	0.74	*0.03*	0.82	*0.08*	0.78	*0.10*	0.26	*0.15*	0.58	*0.18*	0.20	*0.11*
	8-15	0.93	*0.02*	1.01	*0.18*	0.85	*0.21*	0.46	*0.04*	0.77	*0.13*	0.46	*0.11*
Seawater	0-4	0.64	*0.05*	0.71	*0.05*	0.51	*0.19*	0.15	*0.03*	0.39	*0.05*	0.17	*0.09*
	4-8	0.74	*0.03*	0.84	*0.06*	0.67	*0.06*	0.26	*0.15*	0.42	*0.07*	0.36	*0.01*
	8-15	0.93	*0.02*	1.00	*0.10*	0.71	*0.13*	0.46	*0.04*	0.70	*0.07*	0.43	*0.02*

Table 9-54. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.88	*0.03*	0.88	*0.06*	0.47	*0.28*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.12	*0.03*	1.06	*0.13*	0.59	*0.10*	<0.01	-	<0.01	-	<0.01	-
	8-15	1.20	*0.02*	1.02	*0.21*	0.66	*0.06*	0.01	*0.01*	<0.01	-	<0.01	-
Seawater	**0-4**	0.88	*0.03*	0.79	*0.10*	0.48	*0.06*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.12	*0.03*	0.88	*0.08*	0.64	*<0.01*	<0.01	-	<0.01	-	<0.01	-
	8-15	1.20	*0.02*	1.05	*0.16*	0.69	*0.04*	0.01	*0.01*	<0.01	-	<0.01	-

Table 9-55. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.09	*0.03*	0.15	*0.03*	0.09	*0.03*	0.24	*<0.01*	0.51	*0.23*	0.22	*0.01*
	4-8	0.27	*0.22*	0.40	*0.22*	0.23	*0.17*	0.26	*<0.01*	0.36	*0.06*	0.25	*0.03*
	8-15	0.51	*0.01*	0.58	*0.15*	0.45	*0.07*	0.24	*0.02*	0.45	*0.24*	0.23	*<0.01*
Seawater	**0-4**	0.09	*0.03*	0.18	*<0.01*	0.13	*0.01*	0.24	*<0.01*	0.41	*0.24*	0.14	*0.04*
	4-8	0.27	*0.22*	0.39	*0.13*	0.32	*0.06*	0.26	*<0.01*	0.24	*0.06*	0.14	*0.03*
	8-15	0.51	*0.01*	0.63	*0.09*	0.42	*0.06*	0.24	*0.02*	0.39	*0.15*	0.15	*0.06*

Table 9-56. Selected sediment properties before and after inundation of the Waltowa soil material (Site 2): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.79	*0.06*	0.91	*0.19*	0.65	*0.06*
	4-8	1.34	*0.35*	1.36	*0.19*	1.10	*0.32*
	8-15	1.45	*0.16*	1.43	*0.14*	1.22	*0.09*
Seawater	**0-4**	0.79	*0.06*	1.01	*0.05*	0.75	*0.09*
	4-8	1.34	*0.35*	1.36	*0.05*	1.68	*0.89*
	8-15	1.45	*0.16*	1.49	*0.16*	1.33	*0.23*

Table 9-57. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.058	*0.015*	0.036	*0.013*	0.025	*0.007*	<0.001	-	0.002	-	0.001	*<0.001*
	4-8	0.043	*0.037*	0.048	*0.028*	0.034	*0.018*	<0.001	-	<0.001	-	0.001	*0.001*
	8-15	0.029	*0.023*	0.033	*0.024*	0.025	*0.006*	<0.001	-	<0.001	-	0.001	*0.001*
Seawater	**0-4**	0.058	*0.015*	0.016	*0.005*	0.028	*0.024*	<0.001	-	0.001	-	0.002	*0.002*
	4-8	0.043	*0.037*	0.044	*0.026*	0.041	*0.049*	<0.001	-	<0.001	-	0.001	*0.001*
	8-15	0.029	*0.023*	0.031	*0.003*	0.030	*0.020*	<0.001	-	<0.001	-	<0.001	-

Table 9-58. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	<0.001	-	<0.001	-	0.001	*<0.001*	8.688	*1.227*	10.127	*0.806*	2.799	*0.892*
	4-8	<0.001	-	<0.001	-	0.001	*<0.001*	6.463	*0.537*	9.005	*2.512*	2.227	*0.184*
	8-15	<0.001	-	<0.001	-	<0.001	-	6.147	*0.671*	8.031	*10.251*	2.541	*0.660*
Seawater	**0-4**	<0.001	-	<0.001	-	0.002	*0.001*	8.688	*1.227*	11.670	*0.364*	6.483	*1.036*
	4-8	<0.001	-	<0.001	-	0.001	*<0.001*	6.463	*0.537*	8.698	*0.940*	3.532	*1.191*
	8-15	<0.001	-	<0.001	-	<0.001	-	6.147	*0.671*	8.899	*0.115*	5.034	*0.364*

Table 9-59. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.00	-	0.00	-	0.00	-	2.14	*0.08*	1.97	*0.10*	0.66	*1.03*
	4-8	0.00	-	0.00	-	0.00	-	0.96	*1.67*	1.44	*0.18*	0.00	-
	8-15	0.00	-	0.00	-	0.00	-	0.74	*0.79*	0.21	*0.05*	0.00	-
Seawater	**0-4**	0.00	-	0.00	-	0.00	-	2.14	*0.08*	2.04	*0.19*	1.83	*0.08*
	4-8	0.00	-	0.00	-	0.00	-	0.96	*1.67*	1.35	*0.20*	1.11	*0.64*
	8-15	0.00	-	0.00	-	0.00	-	0.74	*0.79*	0.21	*0.25*	0.26	*0.31*

Table 9-60. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.38	*0.01*	0.44	*0.09*	0.33	*0.01*	0.11	*0.02*	0.12	*0.03*	0.07	*0.03*
	4-8	0.23	*0.22*	0.34	*0.11*	0.27	*0.03*	0.09	*0.08*	0.08	*0.05*	0.07	*0.03*
	8-15	0.18	*0.10*	0.24	*0.16*	0.07	*0.03*	0.08	*0.01*	0.15	*0.17*	0.03	*0.03*
Seawater	**0-4**	0.38	*0.01*	0.35	*0.02*	0.29	*0.02*	0.11	*0.02*	0.09	*0.01*	0.10	*0.03*
	4-8	0.23	*0.22*	0.32	*0.03*	0.22	*0.01*	0.09	*0.08*	0.11	*0.08*	0.09	*0.07*
	8-15	0.18	*0.10*	0.18	*0.01*	0.11	*0.06*	0.08	*0.01*	0.10	*0.06*	0.09	*0.02*

Table 9-61. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.03	*0.01*	0.02	*0.01*	0.01	*<0.01*	0.57	*0.54*	0.45	*0.21*	0.20	*0.10*
	4-8	0.03	*<0.01*	0.02	*0.01*	0.01	*<0.01*	0.07	*<0.01*	0.09	*0.03*	0.08	*0.02*
	8-15	0.02	*<0.01*	0.02	*0.02*	0.01	*<0.01*	0.05	*0.01*	0.08	*0.04*	0.05	*0.01*
Seawater	**0-4**	0.03	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.57	*0.54*	0.30	*<0.01*	0.24	*0.10*
	4-8	0.03	*<0.01*	0.01	*0.01*	0.01	*0.01*	0.07	*<0.01*	0.09	*0.03*	0.07	*0.04*
	8-15	0.02	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.05	*0.01*	0.05	*<0.01*	0.07	*0.01*

Table 9-62. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	5745	*1180*	1996	*703*	660	*74*	143.3	*10.0*	81.8	*14.4*	35.0	*3.2*
	4-8	4756	*393*	3225	*1140*	1144	*117*	111.6	*2.6*	96.6	*31.3*	40.4	*3.1*
	8-15	4604	*270*	4214	*1607*	1351	*352*	106.9	*0.2*	119.6	*57.5*	40.3	*12.7*
Seawater	**0-4**	5745	*1180*	3457	*38*	3736	*772*	143.3	*10.0*	141.2	*2.4*	176.1	*2.0*
	4-8	4756	*393*	3314	*490*	2200	*1116*	111.6	*2.6*	110.5	*3.5*	91.0	*31.8*
	8-15	4604	*270*	3234	*58*	3526	*236*	106.9	*0.2*	98.1	*4.3*	111.1	*40.5*

Table 9-63. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3730.0	*590.0*	4648.9	*2140.6*	1886.8	*1224.1*	989.3	*138.8*	356.2	*124.5*	131.0	*5.9*
	4-8	575.9	*112.1*	616.8	*164.5*	312.6	*69.6*	762.0	*91.4*	591.6	*145.4*	231.7	*35.1*
	8-15	556.6	*112.1*	517.0	*47.5*	255.8	*83.0*	782.6	*65.4*	722.4	*209.9*	306.9	*61.7*
Seawater	0-4	3730.0	*590.0*	3351.2	*234.6*	2254.7	*286.8*	989.3	*138.8*	533.5	*22.5*	452.4	*58.2*
	4-8	575.9	*112.1*	665.2	*106.1*	299.5	*141.9*	762.0	*91.4*	583.2	*21.3*	301.2	*179.5*
	8-15	556.6	*112.1*	478.5	*20.2*	394.7	*19.0*	782.6	*65.4*	617.9	*57.6*	532.0	*29.3*

Table 9-64. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	11663	*2715*	3591	*1420*	1394	*185*	8768	*2595*	11375	*4365*	4398	*2599*
	4-8	10130	*907*	7005	*2396*	2572	*289*	935	*120*	1305	*233*	868	*132*
	8-15	9978	*703*	9197	*3555*	3222	*786*	782	*98*	1116	*241*	731	*285*
Seawater	0-4	11663	*2715*	6037	*69*	7194	*1270*	8768	*2595*	8804	*443*	6291	*643*
	4-8	10130	*907*	6771	*616*	4239	*2509*	935	*120*	1482	*395*	891	*513*
	8-15	9978	*703*	6796	*36*	7232	*141*	782	*98*	886	*29*	1320	*266*

Table 9-65. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1575	*276*	1871	*488*	1047	*32*	1786	*334*	2247	*552*	1646	*150*
	4-8	1601	*236*	1806	*873*	1220	*446*	1738	*392*	2180	*952*	1985	*806*
	8-15	1508	*151*	2356	*2104*	812	*277*	1569	*201*	2354	*1726*	1141	*328*
Seawater	0-4	1575	*276*	1153	*134*	1071	*344*	1786	*334*	1467	*125*	1563	*491*
	4-8	1601	*236*	1549	*299*	1042	*457*	1738	*392*	1926	*483*	1544	*814*
	8-15	1508	*151*	1295	*283*	1384	*372*	1569	*201*	1411	*312*	1681	*389*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-66. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	65.4	*43.5*	77.3	*17.7*	55.9	*3.0*	1.37	*0.22*	0.98	*0.53*	0.59	*0.63*
	4-8	38.1	*7.0*	39.1	*7.9*	34.0	*4.4*	1.52	*0.77*	1.53	*0.38*	1.00	*0.70*
	8-15	33.1	*13.2*	33.4	*2.9*	14.5	*4.2*	1.30	*0.30*	1.13	*0.85*	0.42	*0.43*
Seawater	0-4	65.4	*43.5*	56.7	*5.7*	54.0	*9.0*	1.37	*0.22*	1.24	*0.10*	0.84	*0.31*
	4-8	38.1	*7.0*	34.8	*2.5*	27.0	*2.6*	1.52	*0.77*	1.34	*0.24*	0.84	*1.19*
	8-15	33.1	*13.2*	20.7	*4.3*	22.5	*5.9*	1.30	*0.30*	0.71	*0.10*	0.57	*0.49*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-67. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.80	*0.43*	1.73	*0.72*	2.69	*2.08*	6.21	*8.97*	2.59	*1.63*	1.90	*0.66*
	4-8	1.56	*0.02*	1.74	*0.39*	1.70	-	1.81	*0.13*	2.32	*0.23*	1.62	*0.48*
	8-15	1.65	*0.12*	2.96	*3.09*	3.58	*2.19*	1.22	*0.03*	1.43	-	0.85	*0.22*
Seawater	0-4	1.80	*0.43*	1.15	*0.15*	1.24	*0.58*	6.21	*8.97*	1.19	*0.10*	3.42	*3.50*
	4-8	1.56	*0.02*	1.68	*0.26*	1.18	*0.35*	1.81	*0.13*	1.51	*0.02*	1.53	*0.26*
	8-15	1.65	*0.12*	1.52	*0.23*	1.55	*0.26*	1.22	*0.03*	1.09	*0.32*	2.16	*1.61*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-68. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	7.03	*1.66*	3.89	*0.66*	3.47	*0.10*	<0.01	-	0.03	*0.02*	0.01	*<0.01*
	4-8	5.45	*2.01*	4.06	*1.24*	4.84	*2.81*	<0.01	-	0.02	*0.01*	0.01	*0.01*
	8-15	4.79	*0.66*	4.30	*4.21*	2.55	*0.99*	<0.01	-	0.02	*<0.01*	<0.01	-
Seawater	0-4	7.03	*1.66*	2.94	*0.56*	4.00	*1.78*	<0.01	-	0.03	*0.01*	0.02	*0.03*
	4-8	5.45	*2.01*	4.40	*1.02*	5.84	*4.38*	<0.01	-	0.03	*0.01*	0.01	*<0.01*
	8-15	4.79	*0.66*	2.55	*0.94*	10.58	*4.16*	<0.01	-	0.02	*0.01*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-69. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.95	*0.24*	0.96	*0.16*	0.82	*0.06*	6.14	*6.44*	5.91	*4.41*	3.24	*0.59*
	4-8	0.79	*0.26*	0.92	*0.24*	0.87	*0.23*	3.19	*0.14*	4.64	*0.30*	3.24	*0.60*
	8-15	0.60	*0.04*	0.89	*0.72*	0.45	*0.13*	2.55	*0.40*	3.32	-	2.30	*0.06*
Seawater	0-4	0.95	*0.24*	0.73	*0.08*	0.75	*0.20*	6.14	*6.44*	2.27	*0.12*	4.18	*2.18*
	4-8	0.79	*0.26*	0.91	*0.06*	0.61	*0.18*	3.19	*0.14*	2.75	*0.19*	4.13	*0.73*
	8-15	0.60	*0.04*	0.57	*0.13*	0.63	*0.13*	2.55	*0.40*	2.32	*0.42*	4.24	*1.09*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-70. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	2.25	*0.22*	2.05	*0.20*	1.85	*0.45*
	4-8	1.67	*0.33*	2.04	*0.54*	2.41	*0.89*
	8-15	1.59	*0.02*	2.19	*0.86*	1.43	*0.64*
Seawater	0-4	2.25	*0.22*	1.64	*0.30*	1.51	*0.48*
	4-8	1.67	*0.33*	1.85	*0.12*	1.51	*0.05*
	8-15	1.59	*0.02*	2.50	*2.18*	1.88	*0.14*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-71. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	150	*25*	201	*43*	73	*15*	317	*27*	482	*86*	263	*47*
	4-8	156	*26*	185	*46*	90	*16*	284	*89*	303	*105*	245	*83*
	8-15	138	*9*	236	*182*	73	*16*	285	*145*	228	*29*	123	*21*
Seawater	0-4	150	*25*	285	*55*	72	*20*	317	*27*	423	*59*	281	*30*
	4-8	156	*26*	318	*39*	76	*27*	284	*89*	399	*56*	236	*143*
	8-15	138	*9*	279	*174*	117	*96*	285	*145*	274	*77*	155	*56*

Table 9-72. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	48.4	*44.7*	78.1	*28.8*	34.5	*2.3*	0.79	*0.17*	0.83	*0.31*	0.55	*0.01*
	4-8	22.1	*8.3*	19.2	*0.6*	13.3	*0.3*	1.00	*0.01*	0.98	*0.19*	0.90	*0.35*
	8-15	21.7	*12.6*	19.3	*12.6*	6.3	*0.3*	0.84	*0.42*	0.89	*0.45*	0.64	*0.07*
Seawater	0-4	48.4	*44.7*	48.4	*7.8*	37.0	*18.2*	0.79	*0.17*	0.66	*0.12*	0.50	*0.18*
	4-8	22.1	*8.3*	19.3	*4.7*	13.1	*6.2*	1.00	*0.01*	0.93	*0.22*	0.75	*0.59*
	8-15	21.7	*12.6*	11.8	*4.8*	9.4	*4.0*	0.84	*0.42*	0.63	*0.16*	0.80	*0.52*

Table 9-73. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.79	*0.14*	1.15	*0.39*	1.12	*0.70*	0.66	*0.14*	1.16	*0.02*	0.53	*0.07*
	4-8	0.75	*0.01*	0.87	*0.41*	2.02	*2.32*	0.41	*0.26*	0.69	*0.01*	0.45	*0.14*
	8-15	0.68	*0.05*	1.83	*1.86*	1.90	*0.21*	0.27	*0.05*	0.80	*0.65*	0.24	*0.05*
Seawater	0-4	0.79	*0.14*	0.75	*0.06*	0.63	*0.28*	0.66	*0.14*	0.87	*0.08*	0.57	*0.18*
	4-8	0.75	*0.01*	0.90	*0.30*	0.64	*0.16*	0.41	*0.26*	0.75	*0.10*	0.36	*0.10*
	8-15	0.68	*0.05*	0.97	*0.22*	0.99	*0.34*	0.27	*0.05*	0.57	*0.24*	0.49	*0.22*

Table 9-74. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.97	*0.37*	1.96	*0.57*	1.40	*0.46*	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	1.22	*0.99*	1.62	*0.37*	1.55	*1.31*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	8-15	0.88	*0.20*	0.77	*0.34*	0.78	*0.12*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	1.97	*0.37*	1.35	*0.38*	1.71	*0.35*	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	1.22	*0.99*	1.76	*0.18*	0.96	*0.05*	0.01	*<0.01*	0.01	*<0.01*	<0.01	-
	8-15	0.88	*0.20*	2.56	*3.01*	0.49	*0.23*	<0.01	-	<0.01	-	<0.01	-

Table 9-75. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.31	*0.02*	0.42	*0.15*	0.27	*0.01*	0.19	*0.02*	0.83	*0.02*	0.26	*<0.01*
	4-8	0.28	*0.07*	0.29	*0.11*	0.28	*0.11*	0.13	*0.13*	0.43	*0.30*	0.24	*0.02*
	8-15	0.20	*0.04*	0.29	*0.19*	0.18	*0.04*	0.10	*0.05*	0.51	*0.38*	0.15	*0.01*
Seawater	0-4	0.31	*0.02*	0.39	*0.06*	0.23	*0.01*	0.19	*0.02*	0.67	*0.10*	0.40	*0.21*
	4-8	0.28	*0.07*	0.44	*0.03*	0.20	*0.07*	0.13	*0.13*	0.54	*0.12*	0.27	*0.01*
	8-15	0.20	*0.04*	0.26	*0.13*	0.21	*0.12*	0.10	*0.05*	0.44	*0.45*	0.44	*0.12*

Table 9-76. Selected sediment properties before and after inundation of the Meningie soil material (Site 3): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.23	*0.22*	1.18	*0.27*	0.99	*0.09*
	4-8	0.99	*0.27*	1.23	*0.28*	1.65	*1.10*
	8-15	0.88	*0.09*	1.29	*0.77*	0.93	*0.33*
Seawater	0-4	1.23	*0.22*	0.90	*0.03*	1.03	*0.25*
	4-8	0.99	*0.27*	1.13	*0.19*	0.99	*0.07*
	8-15	0.88	*0.09*	1.04	*0.29*	1.23	*0.51*

Table 9-77. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.005	*0.002*	0.001	-	0.001	*0.002*	<0.001	-	<0.001	-	0.002	*0.003*
	4-8	0.004	*0.002*	<0.001	-	0.001	*0.001*	<0.001	-	<0.001	-	<0.001	-
	8-15	0.028	*0.047*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	*0.002*
Seawater	0-4	0.005	*0.002*	0.003	-	0.002	*0.003*	<0.001	-	<0.001	-	0.001	*0.002*
	4-8	0.004	*0.002*	0.001	-	0.002	*0.004*	<0.001	-	<0.001	-	<0.001	-
	8-15	0.028	*0.047*	0.004	*0.008*	0.015	*0.024*	<0.001	-	<0.001	-	<0.001	-

Table 9-78. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	0.002	*0.003*	2.723	*0.825*	2.349	*0.637*	0.446	*0.600*
	4-8	<0.001	-	<0.001	-	<0.001	-	3.071	*1.465*	4.970	*1.337*	0.674	*1.096*
	8-15	<0.001	-	<0.001	-	<0.001	-	4.424	*1.087*	7.748	*1.841*	0.995	*1.421*
Seawater	0-4	<0.001	-	<0.001	-	0.001	*0.002*	2.723	*0.825*	5.484	*1.498*	4.028	*0.061*
	4-8	<0.001	-	<0.001	-	0.001	*0.001*	3.071	*1.465*	6.818	*1.899*	4.041	*0.245*
	8-15	<0.001	-	<0.001	-	<0.001	-	4.424	*1.087*	8.237	*0.940*	4.508	*0.842*

Table 9-79. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): TAA and ANC.

		TAA (mol H^+/t)						ANC (% $CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.00	-	0.87	*1.73*	0.11	*0.10*	0.04	*0.08*	0.00	-
	4-8	0.00	-	1.93	*0.58*	0.33	*0.67*	0.05	*0.09*	0.03	*0.06*	0.00	-
	8-15	0.00	-	0.00	-	0.25	*0.51*	0.00	-	0.04	*0.07*	0.00	-
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.11	*0.10*	0.11	*0.12*	0.01	*0.02*
	4-8	0.00	-	0.00	-	0.00	-	0.05	*0.09*	0.14	*0.23*	0.09	*0.02*
	8-15	0.00	-	0.00	-	0.00	-	0.00	-	0.05	*0.02*	0.13	*0.00*

Table 9-80. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.10	*0.05*	0.14	*0.06*	0.07	*0.03*	0.06	*0.05*	0.05	*0.05*	0.05	*0.02*
	4-8	0.10	*0.06*	0.11	*0.04*	0.04	*0.02*	0.06	*0.08*	<0.01	-	0.01	*0.01*
	8-15	0.09	*0.04*	0.09	*0.01*	0.07	*0.03*	0.05	*0.05*	0.01	*0.02*	0.03	*0.05*
Seawater	0-4	0.10	*0.05*	0.14	*<0.01*	0.08	*0.03*	0.06	*0.05*	0.09	*0.02*	0.07	*0.04*
	4-8	0.10	*0.06*	0.18	*0.18*	0.09	*0.11*	0.06	*0.08*	0.12	*0.16*	0.07	*0.08*
	8-15	0.09	*0.04*	0.20	*0.16*	0.18	*0.13*	0.05	*0.05*	0.14	*0.17*	0.14	*0.11*

Table 9-81. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.02	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.03	*0.01*	0.02	*<0.01*	0.01	*0.01*
	4-8	0.02	*0.01*	0.02	*0.02*	0.00	*<0.01*	0.03	*0.01*	0.02	*<0.01*	0.01	*0.01*
	8-15	0.02	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.03	*0.01*	0.03	*<0.01*	0.02	*0.01*
Seawater	0-4	0.02	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.03	*0.01*	0.05	*0.04*	0.03	*0.01*
	4-8	0.02	*0.01*	0.01	*0.01*	0.01	*0.01*	0.03	*0.01*	0.04	*0.02*	0.02	*0.01*
	8-15	0.02	*<0.01*	0.01	*0.01*	0.01	*0.01*	0.03	*0.01*	0.04	*0.01*	0.06	*0.03*

Table 9-82. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1810	*402*	837	*110*	242	*320*	55.6	*1.4*	39.4	*4.8*	13.5	*4.7*
	4-8	2139	*927*	1646	*450*	335	*528*	51.3	*18.6*	42.4	*3.2*	13.3	*6.3*
	8-15	3127	*644*	2515	*716*	469	*678*	62.7	*17.1*	55.2	*4.8*	16.7	*2.8*
Seawater	0-4	1810	*402*	2508	*2*	2987	*13*	55.6	*1.4*	115.6	*4.5*	134.3	*2.4*
	4-8	2139	*927*	2375	*483*	3010	*27*	51.3	*18.6*	82.8	*16.8*	115.9	*2.6*
	8-15	3127	*644*	2714	*279*	3141	*648*	62.7	*17.1*	71.7	*11.7*	94.1	*27.0*

Table 9-83. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	339.3	*163.0*	125.5	*37.0*	46.8	*71.0*	351.7	*187.6*	173.7	*42.2*	44.0	*61.3*
	4-8	279.5	*136.2*	200.0	*52.0*	56.2	*96.8*	514.0	*280.4*	505.0	*163.0*	103.4	*187.0*
	8-15	299.8	*13.8*	282.2	*59.2*	70.5	*108.7*	844.1	*198.9*	773.9	*165.7*	169.5	*252.4*
Seawater	0-4	339.3	*163.0*	456.5	*519.0*	185.9	*101.3*	351.7	*187.6*	380.7	*54.9*	353.2	*6.5*
	4-8	279.5	*136.2*	363.0	*290.8*	219.8	*143.3*	514.0	*280.4*	520.3	*106.1*	420.4	*7.6*
	8-15	299.8	*13.8*	372.0	*106.0*	276.4	*62.2*	844.1	*198.9*	742.6	*63.8*	546.8	*127.0*

Table 9-84. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3901	*1367*	1695	*386*	495	*709*	604	*371*	284	*10*	84	*109*
	4-8	4832	*2399*	3816	*1171*	846	*1434*	581	*254*	611	*125*	127	*227*
	8-15	7457	*1546*	6160	*1738*	1192	*1879*	636	*69*	820	*98*	241	*338*
Seawater	0-4	3901	*1367*	4561	*182*	5707	*59*	604	*371*	1497	*1402*	917	*117*
	4-8	4832	*2399*	4768	*1153*	5919	*15*	581	*254*	952	*473*	924	*117*
	8-15	7457	*1546*	5963	*492*	6543	*1303*	636	*69*	924	*206*	1089	*14*

Table 9-85. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	820	*255*	1276	*604*	547	*38*	851	*256*	1426	*664*	831	*135*
	4-8	882	*380*	683	*31*	485	*110*	946	*438*	793	*109*	736	*149*
	8-15	1192	*792*	1126	*23*	816	*308*	1239	*931*	1254	*59*	1229	*461*
Seawater	0-4	820	*255*	823	*135*	653	*180*	851	*256*	1030	*170*	942	*283*
	4-8	882	*380*	875	*427*	808	*678*	946	*438*	1052	*540*	1169	*915*
	8-15	1192	*792*	1303	*229*	1122	*103*	1239	*931*	1540	*443*	1690	*261*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-86. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	11.9	*4.0*	18.3	*0.2*	11.3	*6.8*	0.64	*0.10*	0.65	*0.23*	0.18	*0.16*
	4-8	15.3	*0.2*	7.2	*1.7*	6.1	*3.5*	0.51	*0.22*	0.17	*0.34*	<0.01	-
	8-15	8.2	*1.5*	9.6	*4.7*	13.6	*10.9*	0.62	*0.07*	0.65	*0.02*	0.31	*0.23*
Seawater	0-4	11.9	*4.0*	20.5	*14.7*	13.2	*1.5*	0.64	*0.10*	0.50	*0.15*	0.42	*0.23*
	4-8	15.3	*0.2*	24.9	*22.9*	14.8	*21.1*	0.51	*0.22*	0.46	*0.48*	0.31	*0.04*
	8-15	8.2	*1.5*	21.0	*23.0*	21.0	*4.0*	0.62	*0.07*	0.54	*0.06*	1.00	*0.73*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-87. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.83	*0.04*	1.17	*0.34*	0.66	*0.05*	0.84	*0.22*	1.28	*0.34*	0.89	*0.29*
	4-8	1.04	*0.80*	0.99	*0.05*	0.53	*0.13*	4.29	*7.63*	2.32	*3.22*	0.45	*0.12*
	8-15	1.36	*0.15*	0.84	*<0.01*	2.59	*0.63*	2.28	*0.41*	1.02	*0.11*	0.84	*0.03*
Seawater	0-4	0.83	*0.04*	0.94	*0.05*	0.72	*0.01*	0.84	*0.22*	0.78	*0.21*	1.46	*1.22*
	4-8	1.04	*0.80*	0.92	*0.35*	0.85	*0.85*	4.29	*7.63*	0.76	*0.56*	2.97	*3.79*
	8-15	1.36	*0.15*	1.27	*0.57*	1.34	*0.03*	2.28	*0.41*	1.07	*0.59*	2.50	*1.99*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-88. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.61	*0.78*	2.56	*0.86*	1.89	*0.16*	<0.01	-	0.02	*0.01*	0.01	*<0.01*
	4-8	3.70	*0.94*	2.26	*2.45*	1.35	*0.16*	<0.01	-	0.03	*0.02*	0.01	*<0.01*
	8-15	4.45	*0.59*	2.62	*0.95*	2.48	*0.67*	<0.01	-	0.02	*0.01*	0.01	*0.01*
Seawater	0-4	3.61	*0.78*	2.10	*0.19*	2.49	*0.15*	<0.01	-	0.03	*0.01*	<0.01	-
	4-8	3.70	*0.94*	1.75	*1.07*	2.53	*1.65*	<0.01	-	0.02	*0.01*	<0.01	-
	8-15	4.45	*0.59*	3.85	*1.73*	2.91	*0.01*	<0.01	-	0.03	*0.03*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-89. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.42	*0.22*	0.81	*0.60*	0.40	*0.11*	1.86	*0.26*	3.98	*0.78*	2.80	*0.58*
	4-8	0.42	*0.19*	0.27	*0.06*	0.27	*0.11*	3.05	*2.99*	5.15	*3.73*	2.47	*0.07*
	8-15	0.39	*0.17*	0.35	*0.05*	0.47	*0.04*	4.33	*0.47*	3.76	*0.44*	2.90	*0.29*
Seawater	**0-4**	0.42	*0.22*	0.85	*0.80*	0.46	*0.14*	1.86	*0.26*	1.80	*0.05*	3.65	*1.52*
	4-8	0.42	*0.19*	0.66	*<0.01*	0.52	*0.64*	3.05	*2.99*	1.95	*0.76*	4.50	*3.67*
	8-15	0.39	*0.17*	0.57	*0.38*	0.78	*0.06*	4.33	*0.47*	2.56	*0.55*	4.84	*2.13*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-90. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1.47	*0.25*	1.76	*0.49*	1.11	*0.21*
	4-8	2.19	*1.94*	1.39	*0.12*	1.07	*0.04*
	8-15	1.81	*0.91*	1.37	*0.06*	1.98	*0.87*
Seawater	**0-4**	1.47	*0.25*	1.27	*0.01*	1.29	*0.42*
	4-8	2.19	*1.94*	1.32	*0.35*	1.50	*0.37*
	8-15	1.81	*0.91*	1.85	*0.33*	1.89	*0.08*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-91. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	97	*46*	153	*52*	43	*13*	174	*19*	270	*102*	171	*65*
	4-8	98	*28*	69	*2*	40	*29*	220	*142*	158	*19*	129	*6*
	8-15	101	*44*	95	*3*	60	*2*	298	*186*	289	*13*	256	*54*
Seawater	**0-4**	97	*46*	161	*51*	33	*8*	174	*19*	343	*89*	197	*47*
	4-8	98	*28*	166	*89*	49	*55*	220	*142*	370	*233*	260	*144*
	8-15	101	*44*	211	*61*	74	*3*	298	*186*	496	*240*	400	*183*

Table 9-92. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	6.7	*1.7*	12.4	*1.2*	6.5	*3.9*	0.31	*0.05*	0.45	*0.17*	0.22	*0.08*
	4-8	9.4	*0.5*	4.5	*0.8*	3.2	*2.4*	0.39	*0.14*	0.34	*0.02*	0.23	*0.09*
	8-15	3.3	*0.7*	6.0	*4.2*	6.6	*6.5*	0.54	*0.14*	0.53	*0.06*	0.42	*0.06*
Seawater	**0-4**	6.7	*1.7*	14.9	*12.0*	7.3	*1.4*	0.31	*0.05*	0.39	*0.06*	0.31	*0.08*
	4-8	9.4	*0.5*	21.4	*23.3*	8.3	*11.3*	0.39	*0.14*	0.43	*0.22*	0.47	*0.11*
	8-15	3.3	*0.7*	16.3	*22.3*	9.1	*3.3*	0.54	*0.14*	0.63	*0.23*	0.67	*0.31*

Table 9-93. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.31	*0.11*	0.65	*0.24*	0.30	*0.11*	0.21	*0.11*	0.46	*0.03*	0.18	*0.13*
	4-8	0.38	*0.22*	0.47	*0.17*	0.24	*0.08*	0.17	*0.16*	0.84	*0.87*	0.09	*0.03*
	8-15	0.40	*0.24*	0.51	*0.02*	1.19	*0.08*	0.15	*0.13*	0.38	*0.02*	0.13	*0.06*
Seawater	0-4	0.31	*0.11*	0.56	*0.01*	0.35	*0.12*	0.21	*0.11*	0.44	*0.31*	0.20	*0.05*
	4-8	0.38	*0.22*	0.64	*0.27*	0.42	*0.47*	0.17	*0.16*	0.45	*0.33*	0.26	*0.37*
	8-15	0.40	*0.24*	0.77	*0.45*	0.59	*0.10*	0.15	*0.13*	0.44	*0.42*	0.35	*0.11*

Table 9-94. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.82	*0.42*	0.88	*0.33*	0.99	*0.83*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.04	*0.86*	1.36	*1.82*	0.28	*0.11*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.75	*0.18*	0.65	*0.05*	0.69	*0.13*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	0.82	*0.42*	0.90	*0.19*	0.52	*0.06*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.04	*0.86*	0.83	*0.48*	0.60	*0.59*	<0.01	-	0.01	*<0.01*	<0.01	-
	8-15	0.75	*0.18*	1.03	*0.55*	0.57	*0.02*	<0.01	-	<0.01	-	<0.01	-

Table 9-95. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.18	*0.11*	0.49	*0.46*	0.16	*0.07*	0.03	*0.04*	0.25	*0.10*	0.11	*0.01*
	4-8	0.16	*0.05*	0.10	*0.01*	0.08	*0.03*	0.04	*0.02*	0.61	*0.53*	0.10	*0.01*
	8-15	0.09	*0.05*	0.12	*0.04*	0.16	*0.07*	0.04	*0.03*	0.23	*0.05*	0.12	*<0.01*
Seawater	0-4	0.18	*0.11*	0.59	*0.68*	0.17	*0.02*	0.03	*0.04*	0.15	*0.27*	0.14	*0.01*
	4-8	0.16	*0.05*	0.45	*0.07*	0.20	*0.29*	0.04	*0.02*	0.22	*0.05*	0.20	*0.09*
	8-15	0.09	*0.05*	0.26	*0.30*	0.31	*0.10*	0.04	*0.03*	0.21	*0.09*	0.25	*0.09*

Table 9-96. Selected sediment properties before and after inundation of the Meningie soil material (Site 4): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.47	*0.12*	0.78	*0.30*	0.58	*0.09*
	4-8	0.59	*0.13*	0.52	*0.02*	0.39	*0.10*
	8-15	0.64	*0.37*	0.49	*0.19*	0.74	*0.40*
Seawater	0-4	0.47	*0.12*	0.76	*0.09*	0.62	*0.30*
	4-8	0.59	*0.13*	0.81	*0.24*	0.62	*0.57*
	8-15	0.64	*0.37*	0.93	*0.33*	0.82	*0.29*

Table 9-97. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.003	0.001	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	<0.001
	4-8	0.004	<0.001	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	<0.001
	8-15	0.004	0.002	<0.001	-	<0.001	-	<0.001	-	<0.001	-	<0.001	-
Seawater	**0-4**	0.003	0.001	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	0.001
	4-8	0.004	<0.001	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	0.001
	8-15	0.004	0.002	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.002	0.004

Table 9-98. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	<0.001	-	<0.001	-	<0.001	-	0.107	0.014	0.342	0.088	0.142	0.033
	4-8	<0.001	-	<0.001	-	<0.001	-	0.231	0.013	0.456	0.027	0.192	0.178
	8-15	<0.001	-	<0.001	-	<0.001	-	0.412	0.081	0.592	0.155	0.178	0.136
Seawater	**0-4**	<0.001	-	<0.001	-	<0.001	-	0.107	0.014	7.020	0.690	3.068	0.658
	4-8	<0.001	-	<0.001	-	<0.001	-	0.231	0.013	5.821	0.671	3.526	0.439
	8-15	<0.001	-	<0.001	-	<0.001	-	0.412	0.081	5.041	0.428	3.033	0.006

Table 9-99. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1.26	0.70	2.16	0.20	0.97	0.76	0.00	-	0.01	0.02	0.00	-
	4-8	1.19	0.30	1.84	0.33	0.79	0.30	0.00	-	0.02	0.03	0.00	-
	8-15	1.18	0.11	1.72	0.16	0.75	0.10	0.00	-	0.07	0.07	0.00	-
Seawater	**0-4**	1.26	0.70	0.00	-	0.00	-	0.00	-	0.00	0.01	0.10	0.02
	4-8	1.19	0.30	0.00	-	0.00	-	0.00	-	0.05	0.00	0.00	-
	8-15	1.18	0.11	0.00	-	0.00	-	0.00	-	0.02	0.04	0.00	-

Table 9-100. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.08	<0.01	0.13	0.03	0.07	0.01	0.04	0.01	0.02	0.01	0.03	0.01
	4-8	0.07	0.01	0.11	0.01	0.05	0.01	0.02	0.01	0.01	<0.01	0.03	0.01
	8-15	0.08	0.01	0.11	<0.01	0.06	0.01	0.02	0.01	0.01	<0.01	0.01	0.01
Seawater	**0-4**	0.08	<0.01	0.10	0.01	0.05	<0.01	0.04	0.01	0.04	0.04	0.05	0.01
	4-8	0.07	0.01	0.11	<0.01	0.04	<0.01	0.02	0.01	0.08	<0.01	0.05	0.01
	8-15	0.08	0.01	0.11	<0.01	0.05	0.01	0.02	0.01	0.06	0.06	0.04	0.01

Table 9-101. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.02	<0.01	0.01	<0.01	0.01	<0.01	<0.01	-	<0.01	-	<0.01	-
	4-8	0.01	<0.01	0.01	<0.01	<0.01	-	0.01	<0.01	0.01	<0.01	<0.01	-
	8-15	0.02	<0.01	<0.01	-	<0.01	-	0.01	<0.01	0.01	<0.01	<0.01	-
Seawater	**0-4**	0.02	<0.01	0.01	<0.01	0.01	<0.01	<0.01	-	0.03	<0.01	0.02	<0.01
	4-8	0.01	<0.01	<0.01	-	<0.01	-	0.01	<0.01	0.02	<0.01	0.02	<0.01
	8-15	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.02	<0.01	0.02	<0.01

Table 9-102. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Water soluble Na^{+} and K^{+}.

		Na^{+} (ppm)						K^{+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	61	*2*	129	*28*	81	*19*	16.8	*0.1*	23.3	*1.7*	7.4	*1.7*
	4-8	133	*8*	161	*3*	83	*51*	22.8	*1.2*	27.4	*0.1*	8.0	*1.8*
	8-15	228	*41*	199	*52*	92	*73*	26.5	*3.3*	29.3	*4.1*	7.8	*2.6*
Seawater	0-4	61	*2*	2834	*262*	2683	*862*	16.8	*0.1*	117.5	*3.5*	108.2	*24.0*
	4-8	133	*8*	2474	*274*	2801	*344*	22.8	*1.2*	105.8	*2.6*	107.4	*14.4*
	8-15	228	*41*	2134	*247*	2479	*68*	26.5	*3.3*	92.0	*5.3*	95.8	*7.3*

Table 9-103. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	6.8	*0.6*	12.2	*1.9*	10.1	*0.6*	6.6	*0.8*	16.2	*4.9*	10.9	*2.0*
	4-8	10.8	*1.4*	18.6	*1.8*	11.4	*8.9*	13.6	*0.1*	23.6	*2.4*	12.7	*10.5*
	8-15	37.0	*4.7*	32.4	*9.6*	15.0	*10.2*	40.9	*13.2*	37.2	*13.4*	17.3	*14.5*
Seawater	0-4	6.8	*0.6*	124.3	*7.5*	96.5	*33.8*	6.6	*0.8*	350.5	*8.9*	316.2	*76.9*
	4-8	10.8	*1.4*	103.6	*7.2*	96.4	*21.1*	13.6	*0.1*	302.5	*27.5*	311.9	*36.2*
	8-15	37.0	*4.7*	86.3	*13.7*	89.1	*21.6*	40.9	*13.2*	253.9	*34.9*	273.7	*0.7*

Table 9-104. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Water soluble Cl^{-} and SO_4^{2-}.

		Cl^{-} (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	110	*25*	219	*92*	137	*23*	39	*3*	52	*18*	23	*10*
	4-8	183	*28*	237	*17*	136	*67*	100	*5*	105	*21*	40	*66*
	8-15	303	*83*	287	*51*	147	*86*	280	*62*	216	*94*	67	*114*
Seawater	0-4	110	*25*	4906	*487*	4769	*1605*	39	*3*	936	*57*	738	*238*
	4-8	183	*28*	4193	*604*	5075	*769*	100	*5*	814	*69*	732	*173*
	8-15	303	*83*	3527	*444*	4225	*123*	280	*62*	675	*69*	629	*31*

Table 9-105. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	647	*53*	670	*32*	457	*3*	876	*28*	1019	*15*	994	*18*
	4-8	792	*100*	806	*4*	473	*42*	884	*35*	969	*28*	840	*32*
	8-15	747	*39*	766	*37*	479	*56*	812	*27*	976	*24*	845	*89*
Seawater	0-4	647	*53*	647	*86*	418	*2*	876	*28*	1005	*7*	830	*29*
	4-8	792	*100*	725	*55*	456	*37*	884	*35*	909	*89*	745	*95*
	8-15	747	*39*	707	*82*	475	*33*	812	*27*	931	*98*	775	*100*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-106. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	10.6	*1.1*	10.4	*<0.1*	10.1	*0.8*	0.41	*0.09*	0.43	*0.21*	0.16	*0.32*
	4-8	10.6	*0.4*	11.1	*0.1*	9.1	*4.0*	0.57	*0.12*	0.35	*0.05*	0.16	*0.15*
	8-15	15.2	*0.1*	14.5	*2.5*	11.0	*0.9*	0.38	*0.16*	0.25	*0.33*	0.13	*0.27*
Seawater	**0-4**	10.6	*1.1*	10.3	*0.1*	10.5	*4.4*	0.41	*0.09*	0.49	*0.29*	0.25	*0.05*
	4-8	10.6	*0.4*	10.4	*0.3*	7.5	*2.8*	0.57	*0.12*	0.40	*0.28*	0.01	*0.02*
	8-15	15.2	*0.1*	12.9	*0.2*	9.5	*5.0*	0.38	*0.16*	0.17	*0.08*	0.02	*0.04*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-107. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.77	*0.08*	0.75	*0.02*	0.64	*0.05*	0.97	*0.02*	1.48	*1.32*	0.85	*0.04*
	4-8	0.99	*0.26*	0.86	*0.16*	0.68	*0.06*	2.06	*1.90*	2.23	*1.85*	1.14	*0.11*
	8-15	0.90	*0.18*	1.21	*0.42*	0.73	*0.06*	1.45	*0.80*	4.26	-	1.53	*1.24*
Seawater	**0-4**	0.77	*0.08*	0.78	*0.10*	0.54	*0.07*	0.97	*0.02*	0.83	*0.01*	1.17	*0.77*
	4-8	0.99	*0.26*	0.79	*0.17*	0.71	*0.17*	2.06	*1.90*	0.93	*0.02*	4.54	*7.06*
	8-15	0.90	*0.18*	0.84	*0.26*	0.70	*0.05*	1.45	*0.80*	0.95	*0.10*	2.22	*2.77*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-108. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	4.42	*0.41*	2.46	*0.15*	2.82	*0.29*	<0.01	-	0.03	*<0.01*	0.01	*0.01*
	4-8	5.28	*0.12*	2.94	*0.08*	3.13	*0.57*	<0.01	-	0.04	*0.01*	0.03	*0.01*
	8-15	5.08	*0.20*	3.17	*0.13*	3.14	*0.16*	<0.01	-	0.05	*0.01*	0.02	*<0.01*
Seawater	**0-4**	4.42	*0.41*	2.56	*0.11*	2.55	*0.16*	<0.01	-	0.04	*0.01*	0.02	*0.02*
	4-8	5.28	*0.12*	3.34	*0.03*	3.55	*0.42*	<0.01	-	0.04	*<0.01*	0.01	*0.01*
	8-15	5.08	*0.20*	3.02	*0.58*	3.49	*2.22*	<0.01	-	0.04	*0.01*	0.01	*0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-109. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.71	*0.16*	0.70	*0.04*	0.71	*0.03*	2.04	*0.10*	3.23	*0.88*	2.48	*0.16*
	4-8	0.89	*0.07*	0.96	*0.07*	0.97	*0.18*	2.84	*1.36*	3.78	*1.70*	2.69	*0.31*
	8-15	0.91	*0.19*	0.95	*0.06*	0.91	*0.15*	2.50	*0.62*	10.67	*6.73*	2.74	*0.59*
Seawater	**0-4**	0.71	*0.16*	0.78	*0.03*	0.66	*0.15*	2.04	*0.10*	2.32	*0.19*	2.59	*0.68*
	4-8	0.89	*0.07*	0.96	*0.03*	0.79	*0.20*	2.84	*1.36*	2.34	*0.16*	4.60	*3.68*
	8-15	0.91	*0.19*	0.94	*0.02*	0.77	*0.36*	2.50	*0.62*	2.22	*0.18*	3.29	*1.54*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-110. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.23	*0.12*	1.11	*0.16*	1.06	*0.01*
	4-8	1.22	*0.02*	1.14	*0.02*	0.83	*0.12*
	8-15	1.14	*0.01*	1.18	*0.10*	1.07	*0.24*
Seawater	0-4	1.23	*0.12*	1.08	*0.06*	0.84	*0.10*
	4-8	1.22	*0.02*	1.06	*0.07*	0.84	*0.10*
	8-15	1.14	*0.01*	1.07	*0.09*	0.85	*0.10*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-111. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	110	*4*	107	*12*	30	*2*	181	*67*	200	*19*	95	*20*
	4-8	123	*12*	126	*18*	34	*2*	219	*21*	246	*15*	155	*9*
	8-15	120	*3*	119	*15*	31	*2*	197	*38*	214	*36*	122	*13*
Seawater	0-4	110	*4*	144	*14*	28	*3*	181	*67*	311	*48*	166	*10*
	4-8	123	*12*	154	*21*	31	*2*	219	*21*	291	*46*	171	*7*
	8-15	120	*3*	146	*6*	31	*5*	197	*38*	254	*<1*	145	*32*

Table 9-112. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.3	*1.6*	3.8	*0.7*	1.9	*0.8*	0.17	*<0.01*	0.17	*0.03*	0.06	*0.03*
	4-8	4.1	*1.4*	5.6	*<0.1*	3.6	*2.3*	0.14	*<0.01*	0.19	*0.02*	0.06	*0.02*
	8-15	7.1	*0.6*	7.2	*0.3*	4.3	*0.1*	0.14	*0.03*	0.18	*0.01*	0.06	*0.02*
Seawater	0-4	3.3	*1.6*	4.1	*0.6*	4.4	*3.9*	0.17	*<0.01*	0.21	*0.04*	0.13	*0.01*
	4-8	4.1	*1.4*	4.8	*0.5*	2.4	*1.2*	0.14	*<0.01*	0.20	*0.03*	0.12	*0.04*
	8-15	7.1	*0.6*	6.6	*0.9*	3.1	*2.8*	0.14	*0.03*	0.18	*0.02*	0.12	*<0.01*

Table 9-113. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.30	*0.05*	0.51	*0.16*	0.23	*0.03*	0.26	*0.10*	0.55	*0.14*	0.20	*0.04*
	4-8	0.36	*<0.01*	0.51	*0.01*	0.31	*0.14*	0.36	*0.09*	0.75	*0.15*	0.37	*0.10*
	8-15	0.41	*0.07*	0.58	*0.07*	0.25	*0.01*	0.43	*0.04*	0.82	*0.17*	0.30	*0.04*
Seawater	0-4	0.30	*0.05*	0.47	*0.07*	0.30	*0.10*	0.26	*0.10*	0.46	*0.04*	0.37	*0.16*
	4-8	0.36	*<0.01*	0.41	*0.01*	0.27	*0.04*	0.36	*0.09*	0.53	*0.07*	0.31	*0.04*
	8-15	0.41	*0.07*	0.54	*0.07*	0.30	*0.08*	0.43	*0.04*	0.59	*0.02*	0.23	*0.08*

Table 9-114. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1.17	*0.34*	1.47	*0.66*	0.74	*0.10*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	1.90	*0.90*	1.79	*0.14*	1.33	*0.17*	0.02	*0.01*	0.02	*<0.01*	0.02	*0.01*
	8-15	1.85	*0.31*	2.06	*0.06*	1.26	*0.08*	0.02	*<0.01*	0.02	*<0.01*	0.01	*<0.01*
Seawater	**0-4**	1.17	*0.34*	1.50	*0.26*	1.14	*0.18*	0.01	*<0.01*	0.02	*0.01*	0.01	*0.01*
	4-8	1.90	*0.90*	2.34	*1.19*	1.32	*0.02*	0.02	*0.01*	0.01	*<0.01*	0.01	*<0.01*
	8-15	1.85	*0.31*	1.72	*0.07*	1.08	*0.22*	0.02	*<0.01*	0.01	*<0.01*	0.01	*<0.01*

Table 9-115. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.37	*0.20*	0.40	*0.09*	0.24	*0.05*	0.08	*0.02*	0.31	*0.13*	0.10	*<0.01*
	4-8	0.51	*0.10*	0.72	*0.11*	0.52	*0.09*	0.08	*0.01*	0.45	*0.36*	0.11	*<0.01*
	8-15	0.59	*0.17*	0.66	*0.05*	0.43	*0.09*	0.08	*<0.01*	0.42	*0.38*	0.12	*0.02*
Seawater	**0-4**	0.37	*0.20*	0.51	*0.08*	0.34	*0.12*	0.08	*0.02*	0.26	*0.12*	0.15	*<0.01*
	4-8	0.51	*0.10*	0.66	*0.01*	0.44	*0.06*	0.08	*0.01*	0.24	*0.05*	0.14	*0.01*
	8-15	0.59	*0.17*	0.66	*<0.01*	0.39	*0.27*	0.08	*<0.01*	0.31	*<0.01*	0.14	*0.02*

Table 9-116. Selected sediment properties before and after inundation of the Tolderol soil material (Site 5): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.52	*0.03*	0.56	*0.03*	0.44	*0.03*
	4-8	0.56	*0.05*	0.59	*0.01*	0.44	*0.01*
	8-15	0.55	*0.02*	0.65	*0.08*	0.44	*0.02*
Seawater	**0-4**	0.52	*0.03*	0.59	*<0.01*	0.49	*0.02*
	4-8	0.56	*0.05*	0.59	*0.02*	0.52	*0.08*
	8-15	0.55	*0.02*	0.57	*0.02*	0.51	*0.01*

Table 9-117. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.005	*0.001*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	*<0.001*
	4-8	0.004	*<0.001*	<0.001	-	0.001	*0.001*	0.001	<0.001	<0.001	-	0.001	*<0.001*
	8-15	0.004	*0.002*	0.001	-	<0.001	-	<0.001	-	<0.001	-	0.002	*0.001*
Seawater	**0-4**	0.005	*0.001*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.003	*0.004*
	4-8	0.004	*<0.001*	0.001	-	<0.001	-	0.001	<0.001	<0.001	-	0.003	*<0.001*
	8-15	0.004	*0.002*	0.001	-	<0.001	-	<0.001	-	<0.001	-	0.002	*0.001*

Table 9-118. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
	0-4	<0.001	-	<0.001	-	<0.001	-	0.082	0.009	0.445	0.195	0.190	0.200
River Murray	4-8	<0.001	-	<0.001	-	<0.001	-	0.141	0.012	0.430	0.160	0.126	0.015
	8-15	<0.001	-	<0.001	-	<0.001	-	0.246	0.003	0.497	0.142	0.145	0.045
	0-4	<0.001	-	<0.001	-	<0.001	-	0.082	0.009	5.618	1.613	3.329	0.012
Seawater	4-8	<0.001	-	<0.001	-	<0.001	-	0.141	0.012	4.491	0.374	3.984	0.573
	8-15	<0.001	-	<0.001	-	<0.001	-	0.246	0.003	5.705	1.901	4.324	3.320

Table 9-119. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
	0-4	1.11	0.19	2.43	1.23	0.30	0.59	0.03	0.06	0.06	0.09	0.00	-
River Murray	4-8	1.97	1.06	2.82	0.01	0.74	0.01	0.00	-	0.03	0.07	0.00	-
	8-15	2.82	<0.01	2.99	1.01	1.36	0.21	0.00	-	0.00	-	0.00	-
	0-4	1.11	0.19	0.00	-	0.00	-	0.03	0.06	0.05	0.09	0.02	0.04
Seawater	4-8	1.97	1.06	0.00	-	0.00	-	0.00	-	0.03	0.01	0.02	0.05
	8-15	2.82	<0.01	2.32	1.00	0.60	1.19	0.00	-	0.03	0.01	0.00	-

Table 9-120. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
	0-4	0.05	0.01	0.07	0.04	0.04	<0.01	0.02	0.02	<0.01	-	0.01	0.01
River Murray	4-8	0.06	0.01	0.11	0.05	0.03	0.01	0.01	0.02	<0.01	-	0.02	0.02
	8-15	0.06	0.01	0.11	0.03	0.04	0.01	0.01	<0.01	0.01	<0.01	0.02	0.04
	0-4	0.05	0.01	0.09	0.05	0.04	<0.01	0.02	0.02	0.04	<0.01	0.02	0.03
Seawater	4-8	0.06	0.01	0.11	<0.01	0.05	0.01	0.01	0.02	0.05	0.01	0.03	<0.01
	8-15	0.06	0.01	0.11	0.01	0.04	0.01	0.01	<0.01	0.03	0.05	0.03	0.02

Table 9-121. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
	0-4	0.01	<0.01	0.01	<0.01	<0.01	-	<0.01	-	0.01	<0.01	<0.01	-
River Murray	4-8	0.01	0.01	<0.01	-	<0.01	-	0.01	<0.01	0.01	<0.01	<0.01	-
	8-15	0.01	<0.01	0.01	<0.01	<0.01	-	0.02	<0.01	0.02	<0.01	0.01	<0.01
	0-4	0.01	<0.01	<0.01	-	<0.01	-	<0.01	-	0.02	0.01	0.02	0.01
Seawater	4-8	0.01	0.01	<0.01	-	<0.01	-	0.01	<0.01	0.02	<0.01	0.03	0.01
	8-15	0.01	<0.01	0.01	<0.01	<0.01	-	0.02	<0.01	0.03	<0.01	0.02	<0.01

Table 9-122. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
	0-4	30	6	159	84	76	75	13.8	0.3	21.5	0.6	6.1	2.4
River Murray	4-8	57	1	148	72	55	12	18.0	2.1	21.7	1.4	6.1	1.3
	8-15	105	7	146	59	51	31	20.8	2.1	23.7	0.1	7.0	0.9
	0-4	30	6	2334	565	2370	109	13.8	0.3	96.0	20.7	97.2	11.6
Seawater	4-8	57	1	1889	212	2951	393	18.0	2.1	79.9	5.2	111.8	22.5
	8-15	105	7	2457	897	3163	2401	20.8	2.1	101.1	27.7	110.8	73.1

Table 9-123. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	12.9	4.6	25.8	3.8	19.1	1.8	3.8	0.6	17.1	7.0	9.3	6.6
	4-8	16.2	7.4	25.0	1.9	20.2	13.0	8.8	2.9	16.9	6.7	8.1	0.7
	8-15	38.1	0.8	43.2	10.1	22.1	3.2	23.6	3.4	22.4	5.2	9.9	2.7
Seawater	0-4	12.9	4.6	132.9	72.1	95.0	3.9	3.8	0.6	291.1	66.6	287.6	0.7
	4-8	16.2	7.4	94.0	11.5	109.6	15.7	8.8	2.9	223.6	18.3	339.8	63.9
	8-15	38.1	0.8	101.4	32.2	106.2	85.4	23.6	3.4	289.7	100.7	352.3	213.9

Table 9-124. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	38	3	239	125	139	124	56	10	80	32	28	13
	4-8	61	14	209	117	93	18	118	20	172	6	54	46
	8-15	110	12	183	103	78	51	259	8	297	52	96	2
Seawater	0-4	38	3	3950	1160	4178	300	56	10	776	272	644	36
	4-8	61	14	3112	384	5247	877	118	20	651	41	796	235
	8-15	110	12	4195	1610	5802	4940	259	8	837	272	865	561

Table 9-125. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	597	25	690	36	400	5	810	34	1025	14	870	47
	4-8	764	103	794	5	452	44	813	41	1016	38	890	108
	8-15	796	50	856	55	529	11	818	93	984	137	882	21
Seawater	0-4	597	25	584	23	406	31	810	34	877	37	776	0
	4-8	764	103	711	37	449	11	813	41	944	110	723	75
	8-15	796	50	802	11	523	28	818	93	956	8	798	59

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-126. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	15.9	8.3	18.0	3.8	16.4	2.4	0.40	0.13	0.49	0.28	0.08	0.17
	4-8	12.1	3.4	13.9	4.0	11.4	4.4	0.40	0.11	0.43	0.05	0.10	0.21
	8-15	12.7	0.1	14.3	4.2	10.9	0.2	0.50	0.10	0.27	0.14	<0.01	-
Seawater	0-4	15.9	8.3	17.1	3.7	17.8	1.4	0.40	0.13	0.19	0.22	0.02	0.05
	4-8	12.1	3.4	11.7	4.1	6.6	2.2	0.40	0.11	0.48	0.02	<0.01	-
	8-15	12.7	0.1	8.1	1.1	5.8	1.2	0.50	0.10	0.35	0.38	0.38	0.57

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-127. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.78	*0.19*	0.97	*0.06*	0.63	*0.12*	1.26	*0.76*	3.41	*1.63*	0.95	*0.09*
	4-8	0.98	*0.16*	1.39	*0.86*	0.69	*0.22*	1.14	*0.73*	7.28	*1.83*	0.72	*0.04*
	8-15	0.74	*0.02*	0.99	*0.52*	0.70	*0.16*	0.83	*0.31*	1.12	-	0.82	*0.05*
Seawater	0-4	0.78	*0.19*	0.73	*0.01*	0.57	*0.02*	1.26	*0.76*	0.62	*0.09*	0.77	*0.23*
	4-8	0.98	*0.16*	0.73	*0.18*	0.54	*0.11*	1.14	*0.73*	0.52	*0.10*	0.72	*0.53*
	8-15	0.74	*0.02*	0.65	*0.07*	0.59	*0.01*	0.83	*0.31*	0.51	*0.05*	2.73	*3.31*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-128. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	5.38	*3.53*	2.10	*0.41*	1.95	*0.26*	<0.01	-	0.02	*<0.01*	0.04	*0.04*
	4-8	3.81	*0.02*	1.82	*0.36*	1.74	*0.38*	<0.01	-	0.03	*<0.01*	0.01	*0.02*
	8-15	3.58	*0.42*	1.94	*0.52*	1.76	*0.05*	<0.01	-	0.02	*<0.01*	0.01	*<0.01*
Seawater	0-4	5.38	*3.53*	1.72	*0.09*	1.97	*0.50*	<0.01	-	0.03	*<0.01*	0.01	*0.01*
	4-8	3.81	*0.02*	1.68	*0.14*	1.53	*0.53*	<0.01	-	0.02	*0.01*	<0.01	-
	8-15	3.58	*0.42*	1.51	*0.11*	2.15	*1.18*	<0.01	-	0.03	*0.01*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-129. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.59	*0.34*	0.66	*0.14*	0.70	*0.07*	2.37	*0.05*	5.65	*2.20*	2.77	*0.19*
	4-8	0.41	*0.09*	0.45	*0.12*	0.49	*0.06*	2.74	*0.50*	6.99	-	2.60	*0.18*
	8-15	0.34	*0.02*	0.42	*0.17*	0.36	*0.04*	2.58	*0.90*	4.02	-	2.80	*0.43*
Seawater	0-4	0.59	*0.34*	0.68	*0.09*	0.67	*0.13*	2.37	*0.05*	2.22	*0.09*	2.55	*0.25*
	4-8	0.41	*0.09*	0.34	*0.11*	0.25	*0.10*	2.74	*0.50*	2.37	*0.04*	3.02	*1.59*
	8-15	0.34	*0.02*	0.24	*<0.01*	0.22	*0.03*	2.58	*0.90*	2.34	*0.07*	3.64	*1.02*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-130. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.26	*0.29*	1.25	*<0.01*	0.84	*0.05*
	4-8	1.49	*0.74*	1.14	*0.11*	0.92	*0.18*
	8-15	1.02	*0.11*	1.13	*0.16*	0.90	*0.24*
Seawater	0-4	1.26	*0.29*	0.95	*0.04*	0.80	*0.09*
	4-8	1.49	*0.74*	0.95	*0.12*	0.79	*0.00*
	8-15	1.02	*0.11*	1.03	*0.01*	0.88	*0.08*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-131. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	94	*2*	103	*14*	30	*4*	247	*24*	247	*18*	193	*37*
	4-8	114	*2*	120	*1*	27	*1*	216	*4*	227	*13*	122	*10*
	8-15	121	*14*	123	*7*	26	*5*	215	*16*	208	*17*	100	*10*
Seawater	0-4	94	*2*	126	*7*	32	*8*	247	*24*	298	*6*	227	*21*
	4-8	114	*2*	139	*0*	21	*1*	216	*4*	296	*14*	148	*5*
	8-15	121	*14*	130	*12*	23	*13*	215	*16*	283	*27*	153	*81*

Table 9-132. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	7.1	*5.8*	8.8	*3.5*	7.3	*1.9*	0.16	*0.01*	0.21	*0.02*	0.11	*0.02*
	4-8	5.0	*1.6*	6.3	*1.6*	4.6	*1.7*	0.23	*0.01*	0.29	*0.06*	0.07	*<0.01*
	8-15	6.4	*1.6*	6.5	*0.8*	5.1	*1.1*	0.33	*0.11*	0.37	*0.01*	0.12	*0.02*
Seawater	0-4	7.1	*5.8*	9.8	*2.9*	7.7	*0.9*	0.16	*0.01*	0.22	*0.03*	0.14	*0.08*
	4-8	5.0	*1.6*	4.8	*1.9*	1.8	*0.7*	0.23	*0.01*	0.27	*0.03*	0.19	*0.12*
	8-15	6.4	*1.6*	2.8	*0.4*	0.7	*0.2*	0.33	*0.11*	0.37	*0.03*	0.19	*0.01*

Table 9-133. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.27	*0.05*	0.53	*0.06*	0.26	*0.07*	0.17	*0.15*	0.49	*0.04*	0.26	*0.06*
	4-8	0.30	*0.09*	0.46	*0.05*	0.26	*0.07*	0.13	*0.03*	0.39	*0.06*	0.13	*<0.01*
	8-15	0.29	*0.02*	0.40	*0.09*	0.22	*0.04*	0.15	*0.04*	0.36	*0.11*	0.11	*0.02*
Seawater	0-4	0.27	*0.05*	0.45	*<0.01*	0.28	*0.07*	0.17	*0.15*	0.34	*0.02*	0.22	*0.08*
	4-8	0.30	*0.09*	0.42	*0.11*	0.26	*0.09*	0.13	*0.03*	0.20	*0.02*	0.08	*0.01*
	8-15	0.29	*0.02*	0.36	*0.05*	0.25	*0.08*	0.15	*0.04*	0.19	*0.02*	0.05	*0.03*

Table 9-134. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.21	*0.10*	0.97	*0.05*	0.67	*0.21*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.73	*0.05*	0.65	*0.04*	0.41	*0.08*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.84	*0.21*	0.58	*0.02*	0.27	*0.04*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	1.21	*0.10*	0.76	*0.03*	0.59	*0.18*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.73	*0.05*	1.10	*1.09*	0.28	*0.06*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.84	*0.21*	0.47	*0.02*	0.28	*0.18*	<0.01	-	<0.01	-	<0.01	-

Table 9-135. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.31	*0.27*	0.42	*0.09*	0.33	*0.07*	0.08	*0.01*	0.30	*0.07*	0.12	*0.02*
	4-8	0.16	*0.03*	0.18	*0.04*	0.17	*0.01*	0.08	*0.02*	0.31	*<0.01*	0.13	*0.05*
	8-15	0.14	*0.01*	0.15	*0.01*	0.12	*0.02*	0.09	*0.02*	0.30	*0.05*	0.09	*0.01*
Seawater	**0-4**	0.31	*0.27*	0.48	*0.08*	0.33	*0.08*	0.08	*0.01*	0.42	*0.11*	0.15	*<0.01*
	4-8	0.16	*0.03*	0.16	*0.06*	0.07	*0.04*	0.08	*0.02*	0.28	*0.01*	0.14	*<0.01*
	8-15	0.14	*0.01*	0.08	*<0.01*	0.04	*0.03*	0.09	*0.02*	0.33	*0.17*	0.13	*0.03*

Table 9-136. Selected sediment properties before and after inundation of the Tolderol soil material (Site 6): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.51	*0.01*	0.57	*0.03*	0.45	*0.04*
	4-8	0.41	*0.09*	0.40	*0.06*	0.47	*0.02*
	8-15	0.30	*0.09*	0.31	*<0.01*	0.26	*0.08*
Seawater	**0-4**	0.51	*0.01*	0.54	*0.03*	0.47	*0.10*
	4-8	0.41	*0.09*	0.52	*0.04*	0.33	*0.05*
	8-15	0.30	*0.09*	0.49	*0.07*	0.23	*0.04*

Table 9-137. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.001	*0.001*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	*<0.001*
	4-8	0.002	*0.003*	<0.001	-	0.001	*<0.001*	<0.001	-	<0.001	-	0.001	*<0.001*
	8-15	0.001	*<0.001*	<0.001	-	0.001	*0.001*	<0.001	-	<0.001	-	0.001	*<0.001*
Seawater	**0-4**	0.001	*0.001*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.002	*0.001*
	4-8	0.002	*0.003*	<0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	*0.003*
	8-15	0.001	*<0.001*	0.001	-	<0.001	-	<0.001	-	<0.001	-	0.001	*0.002*

Table 9-138. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	<0.001	-	<0.001	-	<0.001	-	0.212	*0.168*	0.238	*0.029*	0.104	*0.017*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.276	*0.151*	0.476	*0.008*	0.188	*0.065*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.581	*0.173*	0.893	*0.079*	0.381	*0.305*
Seawater	**0-4**	<0.001	-	<0.001	-	<0.001	-	0.212	*0.168*	5.017	*0.050*	3.535	*1.224*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.276	*0.151*	3.660	*0.374*	3.843	*0.430*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.581	*0.173*	3.566	*0.972*	3.611	*1.442*

Table 9-139. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	3.54	*0.03*	4.09	*0.65*	2.30	*1.06*	0.00	-	0.00	-	0.00	-
	4-8	3.83	*1.33*	3.65	*0.23*	4.29	*2.57*	0.04	*0.08*	0.00	-	0.00	-
	8-15	9.40	*2.98*	8.70	*0.48*	5.27	*2.94*	0.03	*0.06*	0.00	-	0.00	-
Seawater	**0-4**	3.54	*0.03*	2.24	*0.59*	0.45	*0.89*	0.00	-	0.02	*0.03*	0.00	-
	4-8	3.83	*1.33*	2.76	*1.17*	1.37	*0.96*	0.04	*0.08*	0.01	*0.03*	0.01	*0.02*
	8-15	9.40	*2.98*	5.80	*2.46*	3.57	*2.74*	0.03	*0.06*	0.03	*0.06*	0.00	-

Table 9-140. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.06	*0.01*	0.10	*<0.01*	0.05	*0.01*	0.02	*<0.01*	0.03	*0.01*	0.03	*0.01*
	4-8	0.08	*0.01*	0.11	*0.06*	0.11	*0.01*	0.05	*0.04*	0.01	*0.02*	0.07	*0.04*
	8-15	0.16	*0.05*	0.21	*0.04*	0.15	*0.04*	0.14	*0.06*	0.09	*0.01*	0.08	*0.15*
Seawater	**0-4**	0.06	*0.01*	0.09	*0.04*	0.05	*0.02*	0.02	*<0.01*	0.06	*0.06*	0.04	*0.02*
	4-8	0.08	*0.01*	0.11	*0.04*	0.09	*0.01*	0.05	*0.04*	0.09	*0.04*	0.08	*0.02*
	8-15	0.16	*0.05*	0.18	*<0.01*	0.18	*0.09*	0.14	*0.06*	0.13	*0.04*	0.18	*0.09*

Table 9-141. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.01	*<0.01*	<0.01	-	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*
	8-15	0.02	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.04	*0.01*	0.04	*<0.01*	0.03	*0.01*
Seawater	**0-4**	0.01	*<0.01*	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.02	*<0.01*	0.02	*<0.01*
	4-8	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*0.01*	0.02	*<0.01*	0.03	*<0.01*
	8-15	0.02	*0.01*	0.01	*<0.01*	0.02	*0.01*	0.04	*0.01*	0.04	*<0.01*	0.05	*0.02*

Table 9-142. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	102	*102*	79	*2*	57	*6*	28.0	*11.1*	28.4	*4.2*	8.0	*0.4*
	4-8	140	*84*	154	*16*	89	*43*	26.5	*5.0*	26.1	*2.8*	8.7	*2.5*
	8-15	304	*70*	279	*48*	168	*141*	36.0	*6.4*	38.5	*6.2*	15.7	*8.7*
Seawater	**0-4**	102	*102*	2097	*48*	2650	*1045*	28.0	*11.1*	92.3	*6.2*	103.1	*33.9*
	4-8	140	*84*	1520	*247*	2928	*346*	26.5	*5.0*	71.0	*3.9*	87.1	*0.2*
	8-15	304	*70*	1482	*506*	2676	*1032*	36.0	*6.4*	69.5	*9.9*	85.4	*20.1*

Table 9-143. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	22.5	*27.1*	8.9	*1.8*	5.5	*0.1*	16.2	*18.0*	11.9	*0.6*	6.8	*0.2*
	4-8	18.0	*21.2*	16.7	*1.0*	6.8	*3.3*	22.0	*21.6*	25.6	*0.1*	12.6	*5.3*
	8-15	31.7	*1.1*	34.1	*7.5*	16.0	*15.5*	59.3	*13.7*	63.5	*7.9*	36.3	*35.3*
Seawater	0-4	22.5	*27.1*	80.1	*2.4*	92.3	*49.8*	16.2	*18.0*	253.8	*7.2*	313.7	*97.4*
	4-8	18.0	*21.2*	61.3	*3.1*	88.5	*11.7*	22.0	*21.6*	179.4	*20.7*	287.8	*19.1*
	8-15	31.7	*1.1*	62.0	*18.9*	85.4	*41.2*	59.3	*13.7*	176.0	*53.2*	276.5	*111.3*

Table 9-144. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	130	*131*	97	*<1*	80	*17*	136	*106*	82	*24*	39	*7*
	4-8	170	*96*	180	*18*	98	*69*	197	*167*	237	*5*	122	*18*
	8-15	355	*96*	314	*71*	156	*159*	481	*137*	519	*120*	325	*263*
Seawater	0-4	130	*131*	3408	*132*	4788	*2127*	136	*106*	701	*69*	721	*315*
	4-8	170	*96*	2396	*322*	5098	*685*	197	*167*	601	*94*	830	*155*
	8-15	355	*96*	2219	*779*	4523	*1819*	481	*137*	728	*136*	877	*464*

Table 9-145. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	944	*279*	1017	*151*	621	*5*	803	*133*	951	*19*	810	*31*
	4-8	1049	*216*	839	*119*	793	*395*	861	*221*	828	*142*	1094	*509*
	8-15	1799	*278*	1745	*101*	1215	*610*	1733	*387*	1821	*68*	1683	*828*
Seawater	0-4	944	*279*	871	*1*	637	*53*	803	*133*	846	*89*	908	*252*
	4-8	1049	*216*	827	*3*	913	*107*	861	*221*	816	*45*	1077	*116*
	8-15	1799	*278*	1731	*286*	1626	*280*	1733	*387*	1756	*355*	2007	*454*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-146. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	8.1	*0.6*	9.3	*0.9*	5.3	*1.5*	0.49	*0.30*	0.48	*0.17*	0.15	*0.07*
	4-8	11.8	*2.8*	10.2	*2.5*	6.7	*2.9*	0.39	*0.24*	0.15	*0.22*	0.21	*0.36*
	8-15	11.9	*2.0*	12.4	*0.3*	8.0	*4.8*	0.51	*0.13*	0.54	*0.07*	0.12	*0.16*
Seawater	0-4	8.1	*0.6*	8.9	*3.1*	6.1	*0.8*	0.49	*0.30*	0.33	*0.09*	0.01	*0.02*
	4-8	11.8	*2.8*	9.5	*0.6*	8.0	*3.2*	0.39	*0.24*	0.25	*0.24*	<0.01	-
	8-15	11.9	*2.0*	10.7	*2.3*	10.2	*0.6*	0.51	*0.13*	0.56	*0.24*	0.08	*0.02*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-147. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.92	*0.01*	1.07	*0.12*	1.16	*0.66*	0.55	*0.10*	1.35	*1.44*	0.56	*0.03*
	4-8	1.02	*0.27*	0.87	*0.25*	1.27	*0.98*	0.66	*0.26*	0.96	*0.87*	0.89	*0.57*
	8-15	1.49	*0.38*	1.63	*0.41*	1.73	*0.91*	1.19	*0.30*	1.24	*0.04*	1.13	*0.53*
Seawater	0-4	0.92	*0.01*	0.98	*0.09*	0.85	*0.22*	0.55	*0.10*	0.61	*0.12*	1.14	*0.48*
	4-8	1.02	*0.27*	0.82	*0.01*	0.97	*0.08*	0.66	*0.26*	0.51	*0.05*	1.07	*0.72*
	8-15	1.49	*0.38*	1.48	*0.10*	1.62	*0.19*	1.19	*0.30*	1.11	*0.24*	5.27	*5.64*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-148. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.58	*0.37*	2.62	*0.83*	1.89	*0.06*	<0.01	-	0.01	*<0.01*	0.01	*0.01*
	4-8	3.80	*0.25*	1.83	*1.06*	2.23	*0.98*	<0.01	-	0.02	*0.01*	0.02	*0.02*
	8-15	5.03	*0.59*	2.95	*0.21*	3.13	*1.43*	<0.01	-	0.03	*0.02*	0.01	*0.00*
Seawater	0-4	3.58	*0.37*	1.66	*0.02*	2.08	*0.45*	<0.01	-	0.04	*0.04*	0.01	*0.01*
	4-8	3.80	*0.25*	1.74	*0.27*	2.39	*0.58*	<0.01	-	0.02	*<0.01*	<0.01	-
	8-15	5.03	*0.59*	3.16	*1.02*	3.87	*0.50*	<0.01	-	0.02	*0.01*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-149. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.23	*0.04*	0.28	*<0.01*	0.22	*0.02*	2.09	*0.29*	3.11	*1.90*	2.71	*0.65*
	4-8	0.31	*0.13*	0.25	*0.02*	0.35	*0.19*	2.17	*0.10*	3.98	*4.17*	2.87	*0.60*
	8-15	0.53	*0.09*	0.57	*0.11*	0.50	*0.25*	3.04	*0.67*	3.05	*0.27*	3.27	*1.06*
Seawater	0-4	0.23	*0.04*	0.30	*0.14*	0.24	*0.05*	2.09	*0.29*	2.07	*0.11*	2.79	*0.02*
	4-8	0.31	*0.13*	0.23	*0.01*	0.30	*0.05*	2.17	*0.10*	2.07	*0.03*	3.80	*2.10*
	8-15	0.53	*0.09*	0.52	*0.14*	0.58	*0.09*	3.04	*0.67*	3.04	*0.47*	5.94	*2.22*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-150. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.09	*0.16*	1.24	*0.37*	1.26	*0.43*
	4-8	1.05	*0.30*	0.83	*0.08*	1.10	*0.54*
	8-15	1.23	*0.20*	1.21	*0.09*	1.39	*0.58*
Seawater	0-4	1.09	*0.16*	0.99	*0.12*	0.99	*0.16*
	4-8	1.05	*0.30*	0.94	*0.07*	1.01	*0.07*
	8-15	1.23	*0.20*	1.23	*0.19*	1.40	*0.14*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-151. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	154	*35*	146	*7*	37	*<1*	149	*24*	167	*25*	84	*18*
	4-8	147	*4*	139	*12*	50	*26*	142	*6*	152	*1*	115	*24*
	8-15	204	*29*	192	*6*	92	*30*	195	*42*	230	*5*	160	*69*
Seawater	**0-4**	154	*35*	154	*2*	24	*4*	149	*24*	211	*34*	139	*39*
	4-8	147	*4*	147	*10*	38	*3*	142	*6*	203	*34*	116	*33*
	8-15	204	*29*	245	*18*	75	*32*	195	*42*	350	*12*	215	*52*

Table 9-152. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1.3	*0.3*	1.7	*<0.1*	0.7	*0.1*	0.27	*0.04*	0.28	*0.06*	0.15	*0.04*
	4-8	1.5	*0.7*	2.1	*0.4*	1.1	*0.1*	0.20	*0.06*	0.19	*0.01*	0.13	*0.08*
	8-15	3.1	*0.5*	3.8	*0.2*	2.4	*1.6*	0.28	*0.08*	0.30	*0.02*	0.12	*<0.01*
Seawater	**0-4**	1.3	*0.3*	1.1	*0.2*	1.1	*0.9*	0.27	*0.04*	0.26	*0.02*	0.24	*0.13*
	4-8	1.5	*0.7*	1.2	*0.2*	0.9	*0.2*	0.20	*0.06*	0.21	*0.01*	0.11	*0.04*
	8-15	3.1	*0.5*	2.7	*1.0*	1.6	*0.7*	0.28	*0.08*	0.26	*0.04*	0.17	*0.09*

Table 9-153. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.42	*0.06*	0.57	*0.13*	0.45	*0.38*	0.10	*<0.01*	0.40	*0.02*	0.04	*<0.01*
	4-8	0.46	*0.01*	0.56	*0.06*	0.49	*0.49*	0.11	*0.04*	0.43	*0.23*	0.07	*0.03*
	8-15	0.60	*0.20*	0.86	*0.17*	0.66	*0.29*	0.23	*0.07*	0.42	*0.04*	0.16	*0.07*
Seawater	**0-4**	0.42	*0.06*	0.54	*0.04*	0.22	*0.05*	0.10	*<0.01*	0.19	*0.09*	0.06	*0.02*
	4-8	0.46	*0.01*	0.45	*0.01*	0.39	*0.07*	0.11	*0.04*	0.19	*0.03*	0.09	*0.04*
	8-15	0.60	*0.20*	0.76	*0.06*	0.66	*0.15*	0.23	*0.07*	0.24	*0.08*	0.20	*0.19*

Table 9-154. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.88	*0.33*	0.67	*0.02*	0.42	*0.11*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.73	*0.05*	0.62	*0.13*	0.44	*0.19*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.99	*0.12*	0.91	*0.08*	0.64	*0.14*	<0.01	-	<0.01	-	<0.01	-
Seawater	**0-4**	0.88	*0.33*	0.53	*0.03*	0.29	*0.06*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.73	*0.05*	0.53	*0.05*	0.39	*0.06*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.99	*0.12*	0.84	*0.02*	0.60	*0.12*	<0.01	-	<0.01	-	<0.01	-

Table 9-155. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.07	*<0.01*	0.08	*<0.01*	0.04	*<0.01*	0.10	*0.02*	0.37	*0.04*	0.09	*<0.01*
	4-8	0.08	*0.04*	0.10	*0.02*	0.08	*0.03*	0.11	*0.03*	0.40	*0.32*	0.11	*0.02*
	8-15	0.17	*0.05*	0.21	*0.03*	0.14	*0.07*	0.13	*0.01*	0.27	*0.10*	0.13	*0.01*
Seawater	**0-4**	0.07	*<0.01*	0.07	*0.02*	0.05	*0.01*	0.10	*0.02*	0.25	*0.20*	0.13	*0.03*
	4-8	0.08	*0.04*	0.07	*0.01*	0.08	*0.01*	0.11	*0.03*	0.21	*0.10*	0.13	*0.07*
	8-15	0.17	*0.05*	0.18	*0.03*	0.13	*0.06*	0.13	*0.01*	0.17	*<0.01*	0.22	*0.24*

Table 9-156. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 7): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.39	*0.19*	0.43	*0.13*	0.34	*0.32*
	4-8	0.29	*0.07*	0.23	*0.01*	0.12	*0.07*
	8-15	0.20	*0.01*	0.23	*0.03*	0.17	*0.04*
Seawater	**0-4**	0.39	*0.19*	0.48	*0.01*	0.28	*0.05*
	4-8	0.29	*0.07*	0.45	*0.03*	0.25	*0.04*
	8-15	0.20	*0.01*	0.48	*0.01*	0.32	*0.06*

Table 9-157. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.002	*<0.001*	0.001	-	0.001	*0.001*	<0.001	-	<0.001	-	0.001	*<0.001*
	4-8	0.002	*0.001*	<0.001	-	0.001	*0.001*	<0.001	-	<0.001	-	0.001	*0.001*
	8-15	0.002	*<0.001*	<0.001	-	0.001	*<0.001*	<0.001	-	<0.001	-	0.001	*<0.001*
Seawater	**0-4**	0.002	*<0.001*	0.002	-	0.001	*0.001*	<0.001	-	<0.001	-	<0.001	-
	4-8	0.002	*0.001*	0.002	-	0.001	*0.001*	<0.001	-	0.001	*0.001*	<0.001	-
	8-15	0.002	*<0.001*	0.002	-	0.001	*<0.001*	<0.001	-	<0.001	-	<0.001	-

Table 9-158. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	<0.001	-	<0.001	-	0.001	*<0.001*	0.169	*0.004*	0.204	*0.001*	0.119	*0.020*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.155	*0.030*	0.296	*0.027*	0.150	*0.001*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.245	*0.062*	0.384	*0.025*	0.240	*0.094*
Seawater	**0-4**	<0.001	-	<0.001	-	0.001	*<0.001*	0.169	*0.004*	4.679	*0.439*	3.252	*0.385*
	4-8	<0.001	-	<0.001	-	0.001	*<0.001*	0.155	*0.030*	3.775	*0.290*	3.401	*1.272*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.245	*0.062*	4.295	*0.685*	3.586	*0.430*

Table 9-159. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	4.06	*0.44*	3.58	*0.10*	3.06	*2.42*	0.00	-	0.00	-	0.00	-
	4-8	4.15	*2.13*	5.53	*3.06*	3.35	*0.35*	0.00	-	0.03	*0.05*	0.00	-
	8-15	6.99	*1.21*	7.53	*2.79*	4.87	*1.65*	0.00	-	0.00	-	0.00	-
Seawater	**0-4**	4.06	*0.44*	1.79	*0.18*	0.91	*0.02*	0.00	-	0.04	*0.07*	0.01	*0.02*
	4-8	4.15	*2.13*	1.97	*0.43*	0.69	*0.06*	0.00	-	0.08	*0.10*	0.00	-
	8-15	6.99	*1.21*	3.26	*1.17*	1.21	*0.50*	0.00	-	0.04	*0.08*	0.00	-

Table 9-160. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.14	*0.04*	0.13	*0.02*	0.09	*0.02*	0.09	*0.03*	0.05	*0.01*	0.05	*0.06*
	4-8	0.09	*0.03*	0.13	*0.07*	0.06	*0.01*	0.06	*0.03*	0.08	*0.09*	0.03	*0.02*
	8-15	0.15	*0.01*	0.14	*<0.01*	0.13	*0.07*	0.10	*0.03*	0.10	*0.02*	0.04	*0.02*
Seawater	0-4	0.14	*0.04*	0.18	*0.08*	0.14	*0.02*	0.09	*0.03*	0.09	*0.02*	0.11	*0.04*
	4-8	0.09	*0.03*	0.14	*0.08*	0.08	*0.05*	0.06	*0.03*	0.09	*0.08*	0.05	*0.01*
	8-15	0.15	*0.01*	0.18	*0.02*	0.10	*<0.01*	0.10	*0.03*	0.15	*0.07*	0.08	*0.02*

Table 9-161. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.02	*0.01*	<0.01	-	0.01	*<0.01*	0.03	*<0.01*	0.02	*0.01*	0.02	*0.01*
	4-8	0.02	*0.02*	0.01	*<0.01*	0.01	*<0.01*	0.02	*<0.01*	0.03	*0.01*	0.02	*<0.01*
	8-15	0.02	*0.01*	<0.01	-	0.01	*<0.01*	0.03	*0.01*	0.02	*0.02*	0.02	*0.01*
Seawater	0-4	0.02	*0.01*	0.01	*<0.01*	0.01	*0.01*	0.03	*<0.01*	0.04	*0.01*	0.05	*0.01*
	4-8	0.02	*0.02*	<0.01	-	0.01	*0.01*	0.02	*<0.01*	0.03	*<0.01*	0.03	*<0.01*
	8-15	0.02	*0.01*	<0.01	-	0.01	*0.01*	0.03	*0.01*	0.04	*<0.01*	0.03	*<0.01*

Table 9-162. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	31	*2*	46	*<1*	44	*<1*	15.2	*3.6*	23.3	*0.8*	8.2	*1.3*
	4-8	32	*2*	55	*3*	42	*3*	16.9	*8.6*	23.9	*5.7*	5.3	*0.1*
	8-15	51	*5*	67	*8*	52	*28*	20.4	*0.9*	26.3	*1.7*	6.4	*1.7*
Seawater	0-4	31	*2*	2036	*215*	2396	*102*	15.2	*3.6*	91.5	*2.8*	92.8	*10.8*
	4-8	32	*2*	1641	*144*	2580	*883*	16.9	*8.6*	73.0	*4.3*	97.4	*10.7*
	8-15	51	*5*	1920	*322*	2535	*516*	20.4	*0.9*	81.3	*16.0*	84.8	*11.9*

Table 9-163. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	38.6	*4.7*	20.3	*4.4*	9.2	*2.7*	13.4	*1.5*	12.1	*1.1*	6.5	*2.0*
	4-8	30.1	*4.6*	30.8	*3.2*	10.8	*1.5*	14.4	*2.6*	20.6	*1.0*	8.2	*2.7*
	8-15	32.0	*13.7*	31.3	*0.7*	23.3	*11.2*	27.8	*6.4*	31.3	*7.3*	20.4	*12.6*
Seawater	0-4	38.6	*4.7*	83.6	*4.7*	79.2	*9.4*	13.4	*1.5*	245.0	*12.8*	259.3	*48.3*
	4-8	30.1	*4.6*	66.5	*11.9*	88.2	*30.8*	14.4	*2.6*	195.2	*0.6*	276.9	*60.2*
	8-15	32.0	*13.7*	79.4	*23.0*	92.3	*4.0*	27.8	*6.4*	220.6	*35.4*	254.9	*31.2*

Table 9-164. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	6	*1*	60	*11*	59	*5*	232	*14*	171	*6*	62	*1*
	4-8	20	*38*	46	*11*	42	*15*	222	*15*	298	*24*	126	*32*
	8-15	22	*37*	44	*4*	33	*4*	345	*84*	392	*34*	257	*148*
Seawater	0-4	6	*1*	3210	*413*	4042	*306*	232	*14*	736	*8*	707	*34*
	4-8	20	*38*	2593	*124*	4377	*1949*	222	*15*	626	*14*	764	*242*
	8-15	22	*37*	3028	*710*	4416	*700*	345	*84*	726	*117*	791	*74*

Table 9-165. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	551	*31*	602	*134*	460	*237*	910	*49*	1016	*346*	1103	*711*
	4-8	624	*317*	805	*354*	358	*7*	769	*56*	1015	*577*	678	*59*
	8-15	890	*161*	1019	*135*	558	*157*	1182	*411*	1149	*214*	1029	*538*
Seawater	0-4	551	*31*	678	*20*	687	*333*	910	*49*	1130	*20*	1546	*776*
	4-8	624	*317*	670	*417*	535	*167*	769	*56*	883	*257*	836	*125*
	8-15	890	*161*	934	*142*	671	*81*	1182	*411*	1238	*28*	1014	*8*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-166. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	6.6	*0.3*	7.5	*2.5*	4.9	*1.4*	0.86	*0.45*	0.58	*0.48*	0.94	*0.15*
	4-8	7.0	*4.5*	6.2	*1.4*	3.9	*1.0*	1.04	*0.74*	0.75	*0.31*	0.47	*0.42*
	8-15	9.4	*2.6*	10.5	*3.0*	9.1	*3.3*	1.51	*0.52*	1.09	*0.34*	1.01	*0.86*
Seawater	0-4	6.6	*0.3*	7.0	*1.2*	6.1	*1.5*	0.86	*0.45*	0.81	*0.83*	0.92	*0.47*
	4-8	7.0	*4.5*	5.5	*4.3*	3.2	*0.2*	1.04	*0.74*	1.16	*1.14*	0.79	*0.55*
	8-15	9.4	*2.6*	8.0	*5.8*	6.9	*5.1*	1.51	*0.52*	1.08	*0.92*	0.95	*0.58*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-167. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.90	*0.45*	0.93	*0.33*	1.08	*0.55*	0.34	*<0.01*	4.13	*7.59*	0.59	*0.03*
	4-8	0.80	*0.36*	0.81	*0.38*	0.55	*0.10*	0.52	*0.01*	0.94	*1.05*	0.39	*0.15*
	8-15	1.00	*0.10*	1.04	*0.17*	1.62	*1.99*	3.46	*5.88*	1.12	*0.66*	3.51	*5.82*
Seawater	0-4	0.90	*0.45*	0.82	*0.05*	1.01	*0.19*	0.34	*<0.01*	0.41	*<0.01*	0.65	-
	4-8	0.80	*0.36*	0.81	*0.11*	0.66	*0.29*	0.52	*0.01*	0.41	*0.15*	0.99	*0.84*
	8-15	1.00	*0.10*	1.00	*0.04*	0.72	*0.21*	3.46	*5.88*	0.51	*0.05*	3.36	*0.93*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-168. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.06	*<0.01*	1.60	*1.26*	1.78	*0.01*	0.01	*0.01*	0.02	*<0.01*	0.01	*0.01*
	4-8	3.31	*1.29*	1.66	*0.62*	1.57	*1.27*	0.01	*0.01*	0.02	*0.01*	0.02	*0.02*
	8-15	3.53	*0.40*	2.03	*0.14*	1.67	*0.94*	0.01	*0.01*	0.03	*0.03*	0.01	*0.01*
Seawater	0-4	3.06	*<0.01*	1.46	*0.37*	2.18	*0.29*	0.01	*0.01*	0.02	*0.01*	0.01	*0.02*
	4-8	3.31	*1.29*	1.54	*0.99*	4.77	*6.18*	0.01	*0.01*	0.02	*0.01*	<0.01	-
	8-15	3.53	*0.40*	1.88	*0.42*	1.86	*0.66*	0.01	*0.01*	0.02	*<0.01*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-169. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.13	*0.02*	0.20	*0.13*	0.16	*0.07*	1.42	*0.11*	1.55	-	2.21	*0.43*
	4-8	0.13	*0.08*	0.19	*0.11*	0.14	*0.06*	1.66	*0.36*	2.34	*1.57*	1.70	*0.42*
	8-15	0.21	*0.07*	0.29	*0.16*	0.20	*0.01*	1.86	-	2.77	*1.78*	3.65	*2.17*
Seawater	0-4	0.13	*0.02*	0.16	*0.01*	0.25	*0.05*	1.42	*0.11*	1.63	*0.05*	4.19	*2.64*
	4-8	0.13	*0.08*	0.15	*0.08*	0.15	*0.05*	1.66	*0.36*	1.66	*0.63*	2.81	*0.17*
	8-15	0.21	*0.07*	0.18	*0.01*	0.20	*0.04*	1.86	-	1.93	*0.13*	4.51	*2.13*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-170. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.70	*0.04*	0.82	*0.27*	0.74	*0.48*
	4-8	0.72	*0.04*	0.86	*0.56*	0.70	*0.26*
	8-15	0.74	*0.08*	1.00	*0.25*	0.75	*0.37*
Seawater	0-4	0.70	*0.04*	0.77	*0.00*	0.88	*0.21*
	4-8	0.72	*0.04*	0.64	*0.22*	0.64	*0.09*
	8-15	0.74	*0.08*	0.83	*0.04*	0.69	*0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-171. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	76	*18*	100	*3*	26	*17*	229	*47*	290	*15*	282	*101*
	4-8	86	*37*	125	*37*	18	*1*	152	*20*	248	*166*	115	*6*
	8-15	122	*14*	160	*17*	30	*13*	228	*18*	272	*1*	141	*10*
Seawater	0-4	76	*18*	113	*14*	27	*12*	229	*47*	509	*63*	429	*87*
	4-8	86	*37*	100	*47*	13	*10*	152	*20*	295	*60*	128	*5*
	8-15	122	*14*	144	*11*	16	*3*	228	*18*	405	*61*	167	*27*

Table 9-172. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.8	*<0.1*	2.5	*0.1*	1.8	*0.5*	0.58	*0.09*	0.54	*0.35*	0.69	*0.07*
	4-8	2.0	*0.4*	3.5	*0.8*	1.4	*0.2*	0.73	*0.58*	0.66	*0.02*	0.26	*0.12*
	8-15	3.6	*0.3*	4.6	*1.1*	2.6	*0.7*	1.20	*0.34*	0.99	*0.51*	0.52	*0.45*
Seawater	0-4	1.8	*<0.1*	1.5	*0.4*	0.8	*0.1*	0.58	*0.09*	0.75	*0.51*	0.66	*0.14*
	4-8	2.0	*0.4*	1.3	*0.6*	0.6	*0.2*	0.73	*0.58*	0.83	*0.79*	0.57	*0.48*
	8-15	3.6	*0.3*	1.4	*0.2*	0.7	*0.4*	1.20	*0.34*	0.82	*0.51*	0.60	*0.54*

Table 9-173. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.48	*0.36*	0.53	*0.02*	0.51	*0.21*	0.06	*<0.01*	0.36	*0.09*	0.05	*<0.01*
	4-8	0.29	*0.13*	0.52	*0.17*	0.19	*0.03*	0.06	*0.01*	0.47	*0.12*	0.03	*<0.01*
	8-15	0.42	*0.13*	0.63	*<0.01*	0.90	*1.41*	0.09	*0.01*	0.58	*0.16*	0.06	*0.01*
Seawater	0-4	0.48	*0.36*	0.44	*0.06*	0.40	*0.02*	0.06	*<0.01*	0.08	*0.05*	0.04	*<0.01*
	4-8	0.29	*0.13*	0.43	*0.07*	0.28	*0.26*	0.06	*0.01*	0.09	*0.10*	0.03	*0.01*
	8-15	0.42	*0.13*	0.48	*0.12*	0.30	*0.11*	0.09	*0.01*	0.04	*0.02*	0.03	*<0.01*

Table 9-174. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.05	*1.06*	0.59	*0.07*	0.43	*0.15*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.52	*0.05*	0.63	*0.23*	0.44	*0.37*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.90	*0.59*	0.60	*0.09*	0.50	*0.33*	0.01	*0.02*	<0.01	-	<0.01	-
Seawater	0-4	1.05	*1.06*	0.44	*0.10*	0.40	*0.09*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.52	*0.05*	0.38	*0.17*	0.23	*0.07*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.90	*0.59*	0.50	*0.15*	0.27	*0.03*	0.01	*0.02*	<0.01	-	<0.01	-

Table 9-175. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.03	*<0.01*	0.05	*0.01*	0.03	*<0.01*	0.06	*0.02*	0.29	*0.17*	0.10	*0.02*
	4-8	0.03	*0.01*	0.06	*0.02*	0.02	*<0.01*	0.05	*0.01*	0.50	*0.19*	0.10	*0.04*
	8-15	0.04	*<0.01*	0.07	*<0.01*	0.04	*0.01*	0.08	*0.02*	0.49	*0.27*	0.12	*0.02*
Seawater	0-4	0.03	*<0.01*	0.03	*<0.01*	0.02	*0.01*	0.06	*0.02*	0.09	*0.10*	0.10	*0.03*
	4-8	0.03	*0.01*	0.03	*0.01*	0.01	*<0.01*	0.05	*0.01*	0.12	*0.07*	0.07	*0.01*
	8-15	0.04	*<0.01*	0.03	*<0.01*	0.01	*<0.01*	0.08	*0.02*	0.04	*0.01*	0.09	*0.01*

Table 9-176. Selected sediment properties before and after inundation of the Point Sturt (South) soil material (Site 8): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.14	*0.02*	0.18	*0.01*	0.18	*0.02*
	4-8	0.12	*0.05*	0.18	*0.10*	0.09	*0.01*
	8-15	0.12	*0.02*	0.18	*0.02*	0.11	*0.05*
Seawater	0-4	0.14	*0.02*	0.34	*0.02*	0.24	*0.06*
	4-8	0.12	*0.05*	0.22	*0.04*	0.15	*0.10*
	8-15	0.12	*0.02*	0.36	*0.02*	0.16	*0.03*

Table 9-177. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.001	0.001	<0.001	-	<0.001	-	0.001	<0.001	<0.001	-	0.001	<0.001
	4-8	0.003	0.001	<0.001	-	0.001	0.001	<0.001	-	<0.001	-	0.001	<0.001
	8-15	0.002	0.001	0.001	-	<0.001	-	0.001	<0.001	<0.001	-	<0.001	-
Seawater	0-4	0.001	0.001	0.001	-	<0.001	-	0.001	<0.001	<0.001	-	<0.001	-
	4-8	0.003	0.001	0.001	-	<0.001	-	<0.001	-	<0.001	-	<0.001	-
	8-15	0.002	0.001	0.001	-	0.001	0.001	0.001	<0.001	<0.001	-	<0.001	-

Table 9-178. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	<0.001	-	0.040	0.011	0.219	0.004	0.068	0.015
	4-8	<0.001	-	<0.001	-	<0.001	-	0.077	0.014	0.254	0.064	0.095	0.003
	8-15	<0.001	-	<0.001	-	<0.001	-	0.071	0.044	0.223	0.002	0.080	0.013
Seawater	0-4	<0.001	-	<0.001	-	<0.001	-	0.040	0.011	5.204	1.559	3.094	0.284
	4-8	<0.001	-	<0.001	-	<0.001	-	0.077	0.014	4.469	0.422	2.610	0.238
	8-15	<0.001	-	<0.001	-	<0.001	-	0.071	0.044	3.965	0.508	2.071	0.249

Table 9-179. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.00	-	0.41	0.82	0.04	0.04	0.01	0.02	0.00	-
	4-8	0.00	-	0.00	-	0.00	-	0.15	0.06	0.05	0.07	0.00	-
	8-15	0.00	-	0.00	-	0.00	-	0.02	0.02	0.02	0.05	0.00	-
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.04	0.04	0.22	0.17	0.02	0.04
	4-8	0.00	-	0.00	-	0.00	-	0.15	0.06	0.27	0.15	0.04	0.07
	8-15	0.00	-	0.00	-	0.00	-	0.02	0.02	0.16	0.14	0.01	0.02

Table 9-180. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.09	0.01	0.14	0.03	0.05	<0.01	0.04	<0.01	0.06	0.01	<0.01	-
	4-8	0.11	0.02	0.12	<0.01	0.04	0.01	0.05	0.04	0.07	0.02	<0.01	-
	8-15	0.11	0.06	0.07	0.03	0.04	0.01	0.02	0.01	0.04	0.03	<0.01	-
Seawater	0-4	0.09	0.01	0.14	<0.01	0.05	0.01	0.04	<0.01	0.04	0.07	0.04	0.01
	4-8	0.11	0.02	0.11	0.02	0.05	0.01	0.05	0.04	0.06	0.01	0.04	0.01
	8-15	0.11	0.06	0.12	0.03	0.04	0.01	0.02	0.01	0.03	0.04	0.02	0.02

Table 9-181. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.01	<0.01	<0.01	-	0.01	<0.01	<0.01	-	<0.01	-	<0.01	-
	4-8	0.01	<0.01	<0.01	-	0.01	<0.01	<0.01	-	<0.01	-	<0.01	-
	8-15	0.01	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	0.01	<0.01	<0.01	-	0.01	0.01	<0.01	-	0.02	0.01	0.02	0.01
	4-8	0.01	<0.01	<0.01	-	0.01	<0.01	<0.01	-	0.02	<0.01	0.02	<0.01
	8-15	0.01	<0.01	<0.01	-	0.01	<0.01	<0.01	-	0.02	<0.01	0.02	<0.01

Table 9-182. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	7	3	35	1	31	10	10.2	1.5	21.3	0.7	4.9	0.0
	4-8	13	10	31	3	28	9	16.3	0.3	22.7	0.2	6.7	1.3
	8-15	17	17	27	1	19	5	12.9	2.4	22.1	1.5	5.6	0.8
Seawater	0-4	7	3	2110	801	1715	532	10.2	1.5	93.3	9.6	74.1	15.0
	4-8	13	10	1756	76	1754	212	16.3	0.3	83.2	9.9	76.5	10.5
	8-15	17	17	1517	165	1382	66	12.9	2.4	74.0	8.8	58.8	11.3

Table 9-183. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	10.3	1.8	41.2	13.6	10.1	1.6	3.6	1.1	14.2	<0.1	6.0	1.1
	4-8	28.5	0.7	62.0	30.7	29.1	2.3	7.4	0.4	17.6	1.3	9.2	0.6
	8-15	24.3	11.9	53.8	1.8	26.4	6.9	4.9	1.6	16.2	1.8	8.4	1.1
Seawater	0-4	10.3	1.8	119.3	64.1	80.8	28.3	3.6	1.1	240.8	79.1	196.5	56.1
	4-8	28.5	0.7	119.5	44.6	93.7	32.4	7.4	0.4	178.9	25.7	197.1	5.1
	8-15	24.3	11.9	107.4	41.3	67.9	7.5	4.9	1.6	170.9	3.3	165.1	25.5

Table 9-184. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	9	4	113	16	54	20	31	6	30	3	7	6
	4-8	11	8	109	11	57	10	35	21	34	13	13	5
	8-15	14	9	94	27	45	5	39	30	36	7	15	3
Seawater	0-4	9	4	3776	1184	3191	1071	31	6	665	245	459	130
	4-8	11	8	3111	208	3237	538	35	21	541	6	482	58
	8-15	14	9	2792	215	2528	197	39	30	486	17	384	42

Table 9-185. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	460	22	591	139	286	35	650	14	898	177	598	47
	4-8	740	192	661	172	425	39	1161	330	863	184	698	189
	8-15	498	73	619	87	384	87	566	143	614	10	475	34
Seawater	0-4	460	22	447	17	329	26	650	14	724	57	601	47
	4-8	740	192	686	357	415	75	1161	330	1258	1180	596	225
	8-15	498	73	513	88	355	33	566	143	733	419	434	20

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-186. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	10.9	*0.1*	17.1	*5.5*	10.9	*1.9*	0.49	*0.08*	0.29	*0.30*	0.07	*0.12*
	4-8	19.2	*3.6*	17.1	*5.5*	11.3	*1.2*	0.57	*0.09*	0.33	*0.15*	0.08	*0.06*
	8-15	8.4	*1.6*	10.3	*1.8*	7.3	*2.3*	0.39	*0.01*	0.44	*0.21*	<0.01	-
Seawater	**0-4**	10.9	*0.1*	13.8	*3.1*	13.6	*1.5*	0.49	*0.08*	0.43	*0.36*	<0.01	-
	4-8	19.2	*3.6*	18.9	*10.3*	7.9	*4.1*	0.57	*0.09*	0.49	*0.52*	<0.01	-
	8-15	8.4	*1.6*	11.9	*6.4*	7.1	*2.6*	0.39	*0.01*	0.59	*0.32*	0.08	*0.16*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-187. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.50	*0.03*	1.21	*0.23*	0.54	*0.19*	0.51	*0.17*	6.93	*2.59*	1.83	*2.80*
	4-8	0.78	*0.23*	0.95	*0.59*	0.66	*0.18*	0.78	*0.09*	5.06	*8.99*	0.54	*0.08*
	8-15	1.28	*1.02*	0.76	*0.16*	0.68	*0.28*	3.06	*3.56*	0.90	*0.69*	0.98	*1.02*
Seawater	**0-4**	0.50	*0.03*	0.70	*0.31*	0.49	*0.11*	0.51	*0.17*	0.42	*0.04*	1.25	*0.31*
	4-8	0.78	*0.23*	0.74	*0.35*	0.62	*0.35*	0.78	*0.09*	0.70	*0.40*	0.82	*0.10*
	8-15	1.28	*1.02*	0.70	*0.13*	0.47	*0.02*	3.06	*3.56*	0.53	*0.15*	1.26	*1.20*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-188. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	2.74	*0.07*	1.82	*0.18*	1.52	*0.39*	0.01	*<0.01*	0.02	*0.02*	0.01	*0.01*
	4-8	3.08	*0.33*	1.63	*0.29*	1.43	*0.34*	0.01	*<0.01*	0.02	*<0.01*	0.00	*<0.01*
	8-15	2.68	*0.09*	1.47	*0.58*	1.23	*0.12*	0.02	*<0.01*	0.02	*0.01*	0.01	*0.01*
Seawater	**0-4**	2.74	*0.07*	2.61	*2.94*	1.40	*0.23*	0.01	*<0.01*	0.03	*0.01*	0.01	*0.02*
	4-8	3.08	*0.33*	1.63	*0.80*	2.09	*1.04*	0.01	*<0.01*	0.04	*0.01*	0.01	*<0.01*
	8-15	2.68	*0.09*	1.45	*0.53*	1.20	*0.37*	0.02	*<0.01*	0.02	*<0.01*	0.01	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-189. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.23	*<0.01*	0.37	*0.09*	0.26	*0.02*	1.87	*0.53*	13.10	*2.83*	2.55	*2.07*
	4-8	0.43	*0.17*	0.40	*0.18*	0.32	*0.06*	2.24	*0.56*	3.83	*4.41*	1.56	*0.17*
	8-15	0.30	*0.05*	0.34	*0.03*	0.33	*0.03*	2.15	*0.71*	2.62	*2.07*	2.36	*1.66*
Seawater	**0-4**	0.23	*0.00*	0.28	*0.02*	0.25	*0.01*	1.87	*0.53*	1.80	*0.62*	1.89	*0.28*
	4-8	0.43	*0.17*	0.47	*0.31*	0.27	*0.05*	2.24	*0.56*	2.20	*0.05*	2.52	*0.73*
	8-15	0.30	*0.05*	0.37	*0.13*	0.29	*0.05*	2.15	*0.71*	2.05	*0.21*	2.30	*1.14*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-190. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.84	*0.04*	1.46	*0.62*	0.94	*0.45*
	4-8	1.09	*0.13*	1.19	*0.28*	1.00	*0.27*
	8-15	0.79	*0.15*	0.94	*0.01*	0.86	*0.66*
Seawater	0-4	0.84	*0.04*	0.96	*0.07*	0.94	*0.32*
	4-8	1.09	*0.13*	1.28	*0.68*	0.91	*0.39*
	8-15	0.79	*0.15*	0.94	*0.35*	0.59	*0.07*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-191. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	70	*<1*	88	*3*	24	*1*	238	*8*	300	*7*	258	*2*
	4-8	116	*48*	108	*23*	33	*12*	431	*154*	286	*33*	257	*152*
	8-15	83	*6*	107	*1*	27	*3*	179	*15*	183	*20*	140	*25*
Seawater	0-4	70	*<1*	103	*49*	23	*7*	238	*8*	337	*117*	261	*73*
	4-8	116	*48*	152	*108*	26	*6*	431	*154*	572	*658*	187	*136*
	8-15	83	*6*	117	*42*	21	*2*	179	*15*	318	*289*	134	*78*

Table 9-192. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.8	*0.3*	7.1	*1.7*	6.6	*0.6*	0.22	*0.02*	0.28	*0.03*	0.17	*0.04*
	4-8	10.3	*4.3*	9.3	*5.2*	8.4	*0.9*	0.34	*0.01*	0.30	*0.07*	0.17	*0.04*
	8-15	4.7	*0.6*	5.7	*1.3*	6.0	*2.3*	0.24	*0.02*	0.27	*0.01*	0.17	*0.03*
Seawater	0-4	3.8	*0.3*	5.6	*2.4*	7.2	*2.6*	0.22	*0.02*	0.28	*0.09*	0.21	*0.11*
	4-8	10.3	*4.3*	10.8	*9.2*	4.3	*3.9*	0.34	*0.01*	0.39	*0.31*	0.19	*0.12*
	8-15	4.7	*0.6*	6.6	*4.8*	4.3	*1.3*	0.24	*0.02*	0.47	*0.42*	0.23	*0.10*

Table 9-193. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.22	*<0.01*	0.38	*0.04*	0.22	*0.10*	0.13	*<0.01*	0.40	*<0.01*	0.14	*<0.01*
	4-8	0.43	*0.12*	0.43	*0.10*	0.38	*0.32*	0.25	*0.10*	0.45	*0.12*	0.20	*0.07*
	8-15	0.37	*0.10*	0.45	*0.05*	0.22	*0.03*	0.17	*0.05*	0.40	*0.04*	0.16	*0.01*
Seawater	0-4	0.22	*<0.01*	0.26	*0.03*	0.24	*0.05*	0.13	*<0.01*	0.13	*0.07*	0.14	*0.03*
	4-8	0.43	*0.12*	0.39	*0.17*	0.34	*0.23*	0.25	*0.10*	0.30	*0.18*	0.16	*0.05*
	8-15	0.37	*0.10*	0.36	*0.02*	0.24	*<0.01*	0.17	*0.05*	0.21	*0.03*	0.14	*0.03*

Table 9-194. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.52	*0.05*	0.66	*0.13*	0.61	*0.09*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.93	*0.50*	0.67	*0.13*	0.60	*0.38*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.61	*0.09*	0.95	*0.81*	0.36	*0.05*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	0.52	*0.05*	0.64	*0.31*	0.46	*0.09*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	0.93	*0.50*	0.71	*0.38*	0.39	*0.09*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.61	*0.09*	0.58	*0.05*	0.35	*0.13*	<0.01	-	<0.01	-	<0.01	-

Table 9-195. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.10	*<0.01*	0.14	*0.01*	0.13	*0.01*	0.06	*0.02*	0.23	*0.10*	0.09	*0.02*
	4-8	0.22	*0.10*	0.19	*0.09*	0.15	*0.06*	0.07	*0.03*	0.27	*0.07*	0.10	*0.03*
	8-15	0.15	*0.02*	0.17	*0.01*	0.15	*0.02*	0.06	*0.02*	0.21	*0.19*	0.08	*0.01*
Seawater	0-4	0.10	*<0.01*	0.14	*0.05*	0.12	*0.05*	0.06	*0.02*	0.07	*0.13*	0.10	*0.01*
	4-8	0.22	*0.10*	0.26	*0.21*	0.12	*0.03*	0.07	*0.03*	0.09	*0.06*	0.10	*0.02*
	8-15	0.15	*0.02*	0.19	*0.08*	0.16	*0.07*	0.06	*0.02*	0.15	*0.03*	0.09	*0.02*

Table 9-196. Selected sediment properties before and after inundation of the Point Sturt (North) soil material (Site 9): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.42	*0.02*	0.52	*0.10*	0.42	*0.05*
	4-8	0.64	*0.12*	0.57	*0.09*	0.51	*0.17*
	8-15	0.36	*0.08*	0.45	*0.06*	0.37	*0.04*
Seawater	0-4	0.42	*0.02*	0.53	*0.07*	0.45	*0.15*
	4-8	0.64	*0.12*	0.72	*0.32*	0.49	*0.14*
	8-15	0.36	*0.08*	0.57	*0.28*	0.33	*0.01*

Table 9-197. Selected sediment properties before and after inundation of the Milang soil material (Site 10): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.002	*0.001*	<0.001	-	0.002	*<0.001*	<0.001	-	0.001	-	0.001	*<0.001*
	4-8	0.002	*<0.001*	0.001	-	0.002	*0.002*	0.001	*<0.001*	<0.001	-	0.001	*<0.001*
	8-15	0.003	*0.002*	0.002	-	0.001	*0.002*	<0.001	-	<0.001	-	0.001	*<0.001*
Seawater	0-4	0.002	*0.001*	0.001	-	0.001	-	<0.001	-	<0.001	-	<0.001	-
	4-8	0.002	*<0.001*	0.002	-	0.002	*0.001*	0.001	*<0.001*	<0.001	-	<0.001	-
	8-15	0.003	*0.002*	0.016	-	0.002	*0.004*	<0.001	-	0.001	-	<0.001	-

Table 9-198. Selected sediment properties before and after inundation of the Milang soil material (Site 10): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	0.002	-	0.003	*<0.001*	0.207	*0.040*	0.304	*0.083*	0.110	*0.015*
	4-8	<0.001	-	<0.001	-	0.005	*<0.001*	0.301	*0.003*	0.489	*0.235*	0.142	*0.023*
	8-15	<0.001	-	<0.001	-	0.001	*0.001*	0.397	*0.096*	0.661	*0.182*	0.251	*0.091*
Seawater	0-4	<0.001	-	<0.001	-	0.001	*0.001*	0.207	*0.040*	3.888	*0.572*	2.996	*1.178*
	4-8	<0.001	-	<0.001	-	0.004	*0.001*	0.301	*0.003*	3.944	*0.397*	2.822	*0.566*
	8-15	<0.001	-	0.001	-	0.002	*<0.001*	0.397	*0.096*	3.767	*0.288*	2.968	*0.489*

Table 9-199. Selected sediment properties before and after inundation of the Milang soil material (Site 10): TAA and ANC.

		TAA ($mol\ H^+/t$)						ANC ($\%CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.66	0.48	1.82	0.05	0.82	0.40	0.00	-	0.49	0.85	0.00	-
	4-8	2.53	0.38	2.28	1.36	0.77	0.60	0.00	-	0.00	-	0.00	-
	8-15	3.55	0.48	2.72	0.35	1.92	2.39	0.00	-	0.00	-	0.00	-
Seawater	0-4	1.66	0.48	1.41	0.71	0.14	0.29	0.00	-	0.10	0.08	0.01	0.02
	4-8	2.53	0.38	1.63	0.59	0.23	0.10	0.00	-	0.06	0.02	0.00	-
	8-15	3.55	0.48	2.53	0.77	0.32	0.63	0.00	-	0.07	0.05	0.01	0.02

Table 9-200. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.18	0.03	0.17	0.05	0.13	0.02	0.13	0.14	0.11	0.01	0.07	0.02
	4-8	0.18	0.01	0.18	0.02	0.11	0.02	0.08	0.01	0.10	0.02	0.06	0.07
	8-15	0.10	0.01	0.14	0.01	0.08	<0.0q	0.07	0.02	0.05	0.01	0.03	0.01
Seawater	0-4	0.18	0.03	0.21	0.06	0.15	0.01	0.13	0.14	0.15	0.02	0.13	0.01
	4-8	0.18	0.01	0.18	0.02	0.13	0.01	0.08	0.01	0.15	0.03	0.11	0.01
	8-15	0.10	0.01	0.13	0.06	0.09	0.03	0.07	0.02	0.09	0.01	0.06	0.02

Table 9-201. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.02	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
	4-8	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
	8-15	0.01	<0.01	<0.01	-	0.01	<0.01	0.02	0.01	0.02	0.01	0.03	0.02
Seawater	0-4	0.02	0.01	0.01	0.01	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.02	<0.01
	4-8	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.02	<0.01
	8-15	0.01	<0.01	<0.01	-	0.02	<0.01	0.02	0.01	0.03	0.01	0.02	0.01

Table 9-202. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	80	15	75	30	59	10	18.1	1.6	18.8	0.8	7.2	1.0
	4-8	107	7	126	70	73	15	17.4	1.1	21.0	2.8	8.3	1.8
	8-15	150	21	164	55	116	45	29.4	12.8	30.7	0.4	12.3	1.7
Seawater	0-4	80	15	1583	167	2059	995	18.1	1.6	79.2	3.0	87.1	24.6
	4-8	107	7	1519	112	1843	337	17.4	1.1	74.1	6.7	81.9	9.8
	8-15	150	21	1514	114	2066	340	29.4	12.8	74.7	2.3	86.9	12.1

Table 9-203. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	15.3	0.3	18.1	1.1	9.4	0.2	13.8	1.1	20.2	7.2	11.3	1.2
	4-8	23.6	5.0	24.1	3.8	11.6	1.0	29.1	0.2	35.8	20.5	18.1	3.9
	8-15	30.9	16.8	31.8	1.4	22.7	5.1	43.5	17.9	52.2	12.4	32.5	12.2
Seawater	0-4	15.3	0.3	65.4	6.6	77.5	34.3	13.8	1.1	185.1	22.7	249.8	109.4
	4-8	23.6	5.0	67.0	6.6	75.4	5.7	29.1	0.2	181.8	9.2	224.5	22.3
	8-15	30.9	16.8	62.6	0.2	74.0	12.9	43.5	17.9	177.0	26.9	220.3	39.9

Table 9-204. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
	0-4	116	*24*	153	*38*	84	*12*	140	*30*	106	*44*	59	*18*
River Murray	**4-8**	146	*9*	209	*97*	94	*15*	259	*5*	221	*69*	109	*11*
	8-15	182	*15*	245	*69*	121	*37*	389	*152*	350	*58*	243	*88*
	0-4	116	*24*	2745	*379*	3906	*2005*	140	*30*	557	*48*	568	*225*
Seawater	**4-8**	146	*9*	2772	*311*	3458	*633*	259	*5*	535	*56*	534	*42*
	8-15	182	*15*	2671	*349*	3806	*819*	389	*152*	601	*32*	572	*3*

Table 9-205. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
	0-4	488	*32*	523	*20*	378	*16*	475	*38*	517	*83*	473	*30*
River Murray	**4-8**	402	*34*	510	*65*	391	*33*	452	*43*	477	*35*	490	*49*
	8-15	882	*319*	1060	*59*	937	*413*	952	*535*	1087	*173*	1344	*819*
	0-4	488	*32*	423	*26*	368	*34*	475	*38*	456	*55*	588	*87*
Seawater	**4-8**	402	*34*	377	*3*	339	*25*	452	*43*	358	*22*	408	*18*
	8-15	882	*319*	921	*276*	730	*408*	952	*535*	1078	*223*	885	*671*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-206. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
	0-4	5.1	*0.1*	5.6	*0.6*	3.9	*0.4*	0.48	*0.08*	0.16	*0.10*	<0.01	-
River Murray	**4-8**	4.1	*0.8*	4.9	*0.7*	4.4	*0.3*	0.29	*0.13*	0.12	*0.04*	0.01	*0.01*
	8-15	5.6	*2.4*	6.6	*0.5*	5.9	*1.9*	0.57	*0.31*	0.56	*0.05*	0.27	*0.35*
	0-4	5.1	*0.1*	3.7	*1.1*	9.0	*1.8*	0.48	*0.08*	0.25	*0.04*	<0.01	-
Seawater	**4-8**	4.1	*0.8*	3.4	*0.1*	4.9	*2.2*	0.29	*0.13*	0.17	*0.06*	0.11	*0.22*
	8-15	5.6	*2.4*	5.5	*2.5*	6.1	*1.8*	0.57	*0.31*	0.62	*0.06*	0.35	*0.18*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-207. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
	0-4	0.69	*0.25*	0.85	*0.06*	0.63	*0.05*	0.60	*0.06*	1.99	*0.86*	0.66	*0.20*
River Murray	**4-8**	0.88	*0.62*	0.78	*0.08*	0.71	*0.22*	0.36	*0.07*	0.69	*0.01*	0.47	*0.04*
	8-15	0.84	*0.01*	1.28	*0.35*	1.27	*0.65*	1.66	*0.92*	4.86	*6.71*	0.79	*0.17*
	0-4	0.69	*0.25*	0.86	*0.34*	1.09	*0.87*	0.60	*0.06*	0.52	*0.16*	1.85	-
Seawater	**4-8**	0.88	*0.62*	0.59	*0.10*	0.74	*0.13*	0.36	*0.07*	0.35	*0.10*	2.71	-
	8-15	0.84	*0.01*	0.89	*0.13*	0.92	*0.52*	1.66	*0.92*	0.59	*0.29*	4.98	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-208. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	2.70	*0.18*	1.26	*0.47*	1.41	*0.24*	0.02	*<0.01*	0.02	*0.01*	<0.01	-
	4-8	2.44	*0.32*	0.99	*0.09*	1.16	*0.41*	0.01	*<0.01*	0.02	*0.01*	0.02	*0.03*
	8-15	3.05	*0.33*	2.13	*0.40*	1.90	*0.73*	0.01	*<0.01*	0.01	*<0.01*	<0.01	-
Seawater	0-4	2.70	*0.18*	2.60	*2.15*	1.78	*0.82*	0.02	*<0.01*	0.03	*0.01*	0.01	*<0.01*
	4-8	2.44	*0.32*	0.50	*0.06*	6.68	*9.55*	0.01	*<0.01*	0.02	*<0.01*	0.01	*0.01*
	8-15	3.05	*0.33*	1.44	*0.14*	4.61	*5.03*	0.01	*<0.01*	0.02	*0.01*	0.01	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-209. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.23	*<0.01*	0.26	*0.07*	0.16	*0.01*	1.70	*0.26*	3.62	*0.30*	2.11	*0.42*
	4-8	0.11	*0.01*	0.16	*0.01*	0.15	*<0.01*	1.60	*0.02*	3.04	*1.34*	1.57	*0.26*
	8-15	0.20	*0.09*	0.28	*0.04*	0.24	*0.08*	2.90	*1.39*	5.30	*2.12*	2.42	*0.47*
Seawater	0-4	0.23	*<0.01*	0.20	*0.15*	0.38	*0.11*	1.70	*0.26*	0.98	*<0.01*	3.89	-
	4-8	0.11	*0.01*	0.12	*0.03*	0.21	*0.10*	1.60	*0.02*	0.93	*0.13*	5.97	*1.51*
	8-15	0.20	*0.09*	0.23	*0.10*	0.29	*0.22*	2.90	*1.39*	1.62	*0.27*	5.76	*2.55*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-210. Selected sediment properties before and after inundation of the Milang soil material (Site 10): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.71	*0.02*	0.92	*0.04*	0.62	*0.03*
	4-8	0.96	*0.43*	0.90	*0.06*	0.66	*0.05*
	8-15	1.12	*0.99*	1.06	*0.01*	0.74	*0.22*
Seawater	0-4	0.71	*0.02*	0.88	*0.17*	0.68	*0.05*
	4-8	0.96	*0.43*	0.66	*0.07*	0.72	*0.12*
	8-15	1.12	*0.99*	0.87	*0.18*	0.82	*0.17*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-211. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	86	*3*	84	*1*	25	*8*	161	*41*	182	*36*	134	*56*
	4-8	58	*2*	76	*2*	24	*13*	197	*<1*	175	*20*	145	*19*
	8-15	123	*13*	143	*4*	41	*<1*	213	*34*	206	*8*	95	*5*
Seawater	0-4	86	*3*	109	*16*	32	*10*	161	*41*	226	*30*	219	*16*
	4-8	58	*2*	87	*10*	22	*12*	197	*<1*	158	*5*	116	*42*
	8-15	123	*13*	175	*59*	29	*9*	213	*34*	368	*32*	112	*22*

Table 9-212. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	2.5	*0.4*	2.5	*0.1*	2.5	*2.0*	0.20	*0.07*	0.24	*0.03*	0.11	*0.04*
	4-8	2.0	*0.3*	2.3	*<0.1*	1.5	*0.4*	0.18	*0.02*	0.21	*0.02*	0.14	*0.07*
	8-15	2.4	*0.8*	2.6	*0.1*	2.0	*0.1*	0.36	*0.06*	0.29	*0.02*	0.16	*0.01*
Seawater	0-4	2.5	*0.4*	1.4	*0.4*	3.6	*1.0*	0.20	*0.07*	0.23	*0.01*	0.17	*<0.01*
	4-8	2.0	*0.3*	1.3	*0.2*	0.8	*0.0*	0.18	*0.02*	0.19	*0.01*	0.14	*0.06*
	8-15	2.4	*0.8*	1.8	*1.3*	0.7	*0.1*	0.36	*0.06*	0.34	*0.07*	0.22	*0.11*

Table 9-213. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.41	*0.10*	0.54	*0.02*	0.33	*0.06*	0.20	*0.08*	0.46	*0.17*	0.11	*0.06*
	4-8	0.33	*0.12*	0.45	*0.12*	0.26	*<0.01*	0.09	*0.02*	0.36	*0.04*	0.11	*<0.01*
	8-15	0.42	*0.02*	0.49	*0.12*	0.42	*0.17*	0.11	*0.01*	0.39	*0.01*	0.08	*0.01*
Seawater	0-4	0.41	*0.10*	0.40	*<0.01*	0.27	*0.01*	0.20	*0.08*	0.17	*0.15*	0.16	*0.08*
	4-8	0.33	*0.12*	0.37	*0.01*	0.26	*0.09*	0.09	*0.02*	0.04	*0.04*	0.06	*0.03*
	8-15	0.42	*0.02*	0.46	*0.10*	0.35	*0.05*	0.11	*0.01*	0.11	*0.14*	0.05	*0.01*

Table 9-214. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.07	*0.95*	0.58	*0.20*	0.33	*0.01*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.48	*0.06*	0.42	*0.12*	0.33	*0.15*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.68	*0.01*	0.56	*0.06*	0.33	*0.02*	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	1.07	*0.95*	0.58	*0.17*	0.38	*0.03*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.48	*0.06*	0.32	*0.01*	0.17	*0.03*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.68	*0.01*	0.50	*0.16*	0.29	*0.04*	<0.01	-	<0.01	-	<0.01	-

Table 9-215. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.11	*0.02*	0.11	*0.05*	0.10	*0.10*	0.08	*0.03*	0.33	*0.15*	0.08	*<0.01*
	4-8	0.05	*0.01*	0.06	*0.02*	0.05	*0.01*	0.06	*0.02*	0.29	*0.02*	0.08	*<0.01*
	8-15	0.06	*0.01*	0.07	*0.01*	0.04	*<0.01*	0.12	*0.01*	0.42	*0.10*	0.09	*0.01*
Seawater	0-4	0.11	*0.02*	0.08	*0.05*	0.10	*0.06*	0.08	*0.03*	0.13	*0.02*	0.09	*<0.01*
	4-8	0.05	*0.01*	0.04	*0.02*	0.03	*0.01*	0.06	*0.02*	0.11	*<0.01*	0.09	*0.01*
	8-15	0.06	*0.01*	0.07	*0.06*	0.03	*0.02*	0.12	*0.01*	0.20	*0.18*	0.11	*0.02*

Table 9-216. Selected sediment properties before and after inundation of the Milang soil material (Site 10): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.37	*0.05*	0.41	*<0.01*	0.31	*0.06*
	4-8	0.37	*0.11*	0.38	*0.04*	0.33	*0.08*
	8-15	0.25	*0.08*	0.20	*0.06*	0.14	*0.08*
Seawater	0-4	0.37	*0.05*	0.52	*0.16*	0.33	*0.02*
	4-8	0.37	*0.11*	0.37	*0.01*	0.33	*0.13*
	8-15	0.25	*0.08*	0.41	*0.09*	0.33	*0.02*

Table 9-217. Selected sediment properties before and after inundation of the Milang soil material (Site 11): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.003	*0.002*	<0.001	-	0.002	*0.001*	0.001	*0.001*	0.001	-	0.001	*0.001*
	4-8	0.003	*<0.001*	0.003	-	0.001	*<0.001*	<0.001	-	<0.001	-	0.001	*0.001*
	8-15	0.002	*0.001*	<0.001	-	0.002	*<0.001*	0.001	*0.001*	<0.001	-	<0.001	-
Seawater	0-4	0.003	*0.002*	0.003	-	0.001	*0.002*	0.001	*0.001*	<0.001	-	<0.001	-
	4-8	0.003	*<0.001*	<0.001	-	0.003	*0.001*	<0.001	-	0.001	-	<0.001	-
	8-15	0.002	*0.001*	0.001	-	0.001	*0.001*	0.001	*0.001*	<0.001	-	<0.001	-

Table 9-218. Selected sediment properties before and after inundation of the Milang soil material (Site 11): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	0.002	-	0.002	*0.001*	0.340	*0.003*	0.407	*0.035*	0.166	*0.002*
	4-8	<0.001	-	<0.001	-	0.003	*0.001*	0.478	*0.008*	0.649	*0.098*	0.227	*0.057*
	8-15	<0.001	-	<0.001	-	0.003	*<0.001*	0.572	*0.109*	0.738	*0.008*	0.178	*0.036*
Seawater	0-4	<0.001	-	<0.001	-	0.001	*<0.001*	0.340	*0.003*	4.683	*0.316*	2.381	*0.666*
	4-8	<0.001	-	0.002	-	0.002	*0.001*	0.478	*0.008*	4.011	*0.324*	3.023	*0.656*
	8-15	<0.001	-	<0.001	-	0.001	*0.001*	0.572	*0.109*	3.344	*0.385*	2.454	*0.478*

Table 9-219. Selected sediment properties before and after inundation of the Milang soil material (Site 11): TAA and ANC.

		TAA (mol H^+/t)						ANC (% $CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.00	-	0.00	-	0.24	*0.02*	0.00	-	0.04	*0.07*
	4-8	0.00	-	0.00	-	0.00	-	0.22	*0.01*	0.00	-	0.05	*0.09*
	8-15	0.70	*1.41*	1.22	*2.44*	0.00	-	0.08	*0.09*	0.00	-	0.00	-
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.24	*0.02*	0.08	*0.05*	0.16	*0.00*
	4-8	0.00	-	0.00	-	0.00	-	0.22	*0.01*	0.04	*0.02*	0.13	*0.09*
	8-15	0.70	*1.41*	0.70	*1.41*	0.00	-	0.08	*0.09*	0.05	*0.00*	0.07	*0.00*

Table 9-220. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.20	*0.04*	0.21	*0.01*	0.17	*0.01*	0.13	*0.03*	0.09	*<0.01*	0.08	*0.04*
	4-8	0.24	*0.01*	0.24	*0.06*	0.14	*0.11*	0.15	*0.02*	0.13	*0.01*	0.07	*0.11*
	8-15	0.13	*0.02*	0.15	*0.01*	0.13	*0.06*	0.11	*0.06*	0.08	*0.04*	0.05	*0.04*
Seawater	0-4	0.20	*0.04*	0.20	*<0.01*	0.18	*0.01*	0.13	*0.03*	0.15	*0.06*	0.12	*0.03*
	4-8	0.24	*0.01*	0.22	*0.06*	0.19	*0.03*	0.15	*0.02*	0.16	*0.01*	0.15	*0.04*
	8-15	0.13	*0.02*	0.15	*0.05*	0.10	*0.01*	0.11	*0.06*	0.11	*0.04*	0.07	*<0.01*

Table 9-221. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	0.01	*0.01*	0.01	*<0.01*	0.01	*0.01*	0.02	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	8-15	0.01	*0.01*	<0.01	-	0.01	*0.01*	0.02	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
Seawater	0-4	0.01	*0.01*	0.01	*<0.01*	0.02	*<0.01*	0.01	*<0.01*	0.03	*<0.01*	0.02	*<0.01*
	4-8	0.01	*0.01*	0.01	*<0.01*	0.02	*<0.01*	0.02	*<0.01*	0.02	*<0.01*	0.03	*<0.01*
	8-15	0.01	*0.01*	<0.01	-	0.02	*<0.01*	0.02	*<0.01*	0.02	*<0.01*	0.02	*<0.01*

Table 9-222. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	106	*30*	81	*7*	69	*7*	21.9	*0.1*	21.3	*0.2*	10.9	*0.6*
	4-8	173	*26*	154	*11*	124	*50*	27.4	*3.9*	31.6	*0.4*	13.2	*0.8*
	8-15	235	*47*	217	*3*	107	*23*	30.4	*8.1*	30.1	*1.0*	11.5	*0.2*
Seawater	0-4	106	*30*	1802	*52*	1615	*539*	21.9	*0.1*	91.8	*2.3*	70.9	*10.3*
	4-8	173	*26*	1581	*123*	1999	*464*	27.4	*3.9*	77.5	*6.9*	92.5	*21.8*
	8-15	235	*47*	1323	*169*	1642	*417*	30.4	*8.1*	61.3	*5.9*	76.0	*7.5*

Table 9-223. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	83.8	*23.5*	82.9	*0.1*	45.2	*3.4*	17.7	*1.7*	24.2	*2.4*	14.4	*1.2*
	4-8	97.1	*9.8*	99.3	*5.9*	35.0	*17.2*	26.8	*1.6*	34.2	*5.2*	21.0	*4.7*
	8-15	78.4	*42.0*	50.4	*3.3*	34.3	*22.1*	40.2	*10.2*	39.5	*1.0*	18.0	*0.3*
Seawater	0-4	83.8	*23.5*	149.6	*2.5*	110.3	*36.3*	17.7	*1.7*	188.8	*15.6*	165.8	*42.6*
	4-8	97.1	*9.8*	133.8	*14.5*	132.2	*26.4*	26.8	*1.6*	158.8	*0.3*	212.7	*43.2*
	8-15	78.4	*42.0*	88.8	*55.0*	78.4	*4.7*	40.2	*10.2*	141.1	*32.5*	191.5	*24.2*

Table 9-224. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	156	*40*	157	*8*	101	*16*	199	*28*	76	*5*	87	*42*
	4-8	240	*26*	257	*32*	167	*52*	278	*8*	187	*25*	108	*60*
	8-15	336	*74*	339	*10*	147	*29*	356	*53*	272	*6*	94	*29*
Seawater	0-4	156	*40*	3225	*202*	2999	*1037*	199	*28*	643	*16*	451	*178*
	4-8	240	*26*	2715	*162*	3837	*1019*	278	*8*	552	*15*	552	*156*
	8-15	336	*74*	2289	*360*	3098	*779*	356	*53*	491	*77*	466	*89*

Table 9-225. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	553	*2*	622	*27*	502	*25*	594	*34*	638	*22*	671	*2*
	4-8	746	*174*	862	*34*	593	*140*	696	*101*	787	*86*	625	*37*
	8-15	715	*153*	808	*103*	433	*70*	639	*197*	656	*78*	465	*142*
Seawater	0-4	553	*2*	515	*7*	429	*54*	594	*34*	635	*47*	640	*11*
	4-8	746	*174*	581	*188*	491	*113*	696	*101*	579	*109*	537	*100*
	8-15	715	*153*	538	*4*	475	*38*	639	*197*	495	*75*	463	*27*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-226. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	12.0	*4.3*	13.4	*1.8*	16.5	*0.4*	0.46	*0.01*	0.24	*0.38*	0.23	*0.22*
	4-8	14.3	*0.9*	12.6	*1.0*	8.5	*3.5*	0.53	*0.06*	0.41	*0.12*	0.07	*0.13*
	8-15	6.2	*2.7*	6.9	*0.1*	6.4	*4.1*	0.40	*0.26*	0.20	*0.24*	0.17	*0.13*
Seawater	0-4	12.0	*4.3*	14.8	*1.1*	17.9	*2.9*	0.46	*0.01*	0.53	*0.01*	0.02	*0.04*
	4-8	14.3	*0.9*	7.6	*3.2*	6.1	*2.8*	0.53	*0.06*	0.36	*0.27*	<0.01	-
	8-15	6.2	*2.7*	5.6	*4.9*	4.3	*1.9*	0.40	*0.26*	0.27	*0.18*	<0.01	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-227. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.70	*0.12*	0.97	*0.24*	0.61	*0.03*	0.74	*0.03*	4.36	*4.88*	0.78	*0.01*
	4-8	0.84	*0.11*	1.11	*0.31*	0.86	*0.02*	0.75	*0.17*	2.64	*2.43*	3.05	*2.43*
	8-15	1.07	*0.39*	1.24	*0.28*	0.56	*0.01*	1.51	*1.94*	7.30	*2.53*	1.01	*1.02*
Seawater	0-4	0.70	*0.12*	0.71	*0.16*	0.78	*0.33*	0.74	*0.03*	0.70	*0.16*	4.61	*0.40*
	4-8	0.84	*0.11*	0.75	*0.25*	0.64	*0.09*	0.75	*0.17*	0.68	*0.25*	0.99	*0.24*
	8-15	1.07	*0.39*	0.75	*0.10*	0.80	*0.06*	1.51	*1.94*	0.48	*0.19*	1.44	*0.54*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-228. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	2.77	*0.05*	1.35	*0.02*	1.38	*0.03*	0.01	*<0.01*	0.02	*<0.01*	0.02	*<0.01*
	4-8	2.91	*0.16*	2.26	*1.75*	1.43	*0.14*	0.01	*0.01*	0.02	*<0.01*	0.00	*0.01*
	8-15	3.11	*0.52*	2.03	*0.90*	1.11	*0.02*	0.01	*<0.01*	0.02	*0.01*	<0.01	-
Seawater	0-4	2.77	*0.05*	1.16	*0.12*	2.98	*1.97*	0.01	*<0.01*	0.03	*0.01*	0.01	*<0.01*
	4-8	2.91	*0.16*	1.04	*0.79*	1.47	*0.03*	0.01	*0.01*	0.02	*<0.01*	0.01	*0.01*
	8-15	3.11	*0.52*	0.86	*0.29*	5.24	*6.43*	0.01	*<0.01*	0.02	*0.01*	0.01	*0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-229. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.29	*0.05*	0.36	*0.03*	0.37	*0.01*	1.90	*0.21*	4.98	*1.11*	1.91	*0.02*
	4-8	0.32	*0.06*	0.49	*0.25*	0.32	*0.07*	1.87	*0.25*	3.10	-	2.75	*0.22*
	8-15	0.32	*0.06*	0.32	*<0.01*	0.29	*0.15*	2.42	*1.15*	4.62	*0.19*	1.71	*0.36*
Seawater	0-4	0.29	*0.05*	0.37	*0.12*	0.40	*0.04*	1.90	*0.21*	1.14	*0.19*	5.98	*2.93*
	4-8	0.32	*0.06*	0.29	*0.09*	0.31	*0.01*	1.87	*0.25*	1.24	*0.36*	2.49	*0.42*
	8-15	0.32	*0.06*	0.22	*0.10*	0.26	*0.07*	2.42	*1.15*	1.32	*0.01*	3.28	*0.39*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-230. Selected sediment properties before and after inundation of the Milang soil material (Site 11): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.74	*0.02*	0.87	*0.03*	0.71	*0.00*
	4-8	0.75	*0.10*	0.99	*0.11*	0.65	*0.08*
	8-15	0.95	*0.34*	1.01	*0.11*	0.57	*0.06*
Seawater	0-4	0.74	*0.02*	0.97	*0.27*	0.82	*0.28*
	4-8	0.75	*0.10*	0.80	*0.04*	0.61	*0.09*
	8-15	0.95	*0.34*	0.75	*0.08*	0.72	*0.15*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-231. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	81	*15*	96	*<1*	43	*1*	132	*6*	179	*8*	204	*21*
	4-8	98	*17*	122	*31*	37	*6*	193	*35*	223	*74*	143	*48*
	8-15	102	*15*	120	*18*	35	*20*	160	*55*	154	*19*	126	*71*
Seawater	0-4	81	*15*	126	*7*	37	*4*	132	*6*	286	*54*	216	*65*
	4-8	98	*17*	150	*40*	40	*<1*	193	*35*	241	*2*	154	*2*
	8-15	102	*15*	143	*26*	33	*3*	160	*55*	200	*82*	92	*5*

Table 9-232. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	8.1	*4.7*	9.4	*1.5*	11.1	*0.9*	0.20	*0.02*	0.24	*0.04*	0.20	*<0.01*
	4-8	10.2	*1.6*	8.8	*1.9*	5.7	*3.1*	0.25	*0.08*	0.29	*0.05*	0.17	*0.04*
	8-15	3.6	*1.9*	3.4	*0.1*	4.4	*4.6*	0.20	*0.01*	0.24	*<0.01*	0.14	*0.10*
Seawater	0-4	8.1	*4.7*	10.4	*1.3*	12.2	*0.8*	0.20	*0.02*	0.26	*<0.01*	0.26	*0.07*
	4-8	10.2	*1.6*	5.5	*3.4*	4.5	*2.9*	0.25	*0.08*	0.28	*0.05*	0.17	*<0.01*
	8-15	3.6	*1.9*	3.9	*4.6*	2.3	*1.5*	0.20	*0.01*	0.20	*0.06*	0.11	*0.02*

Table 9-233. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.40	*0.05*	0.51	*0.16*	0.31	*0.01*	0.26	*0.05*	0.58	*0.10*	0.31	*0.02*
	4-8	0.43	*0.03*	0.57	*<0.01*	0.46	*0.02*	0.31	*0.06*	0.60	*0.26*	0.20	*0.14*
	8-15	0.41	*0.10*	0.58	*<0.01*	0.33	*0.07*	0.24	*0.06*	0.41	*0.10*	0.26	*0.27*
Seawater	**0-4**	0.40	*0.05*	0.42	*0.12*	0.31	*0.01*	0.26	*0.05*	0.29	*0.06*	0.31	*0.07*
	4-8	0.43	*0.03*	0.47	*0.05*	0.39	*0.07*	0.31	*0.06*	0.28	*0.16*	0.35	*0.02*
	8-15	0.41	*0.10*	0.49	*0.09*	0.45	*0.03*	0.24	*0.06*	0.19	*0.18*	0.17	*0.12*

Table 9-234. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.76	*0.31*	0.62	*0.14*	0.59	*0.14*	<0.01	-	<0.01	-	<0.01	-
	4-8	0.67	*0.02*	0.59	*0.17*	0.37	*0.04*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.67	*0.09*	0.59	*0.08*	0.39	*0.17*	<0.01	-	<0.01	-	<0.01	-
Seawater	**0-4**	0.76	*0.31*	0.63	*0.03*	0.51	*0.07*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	0.67	*0.02*	0.61	*0.25*	0.46	*0.05*	<0.01	-	0.01	*<0.01*	0.01	*0.02*
	8-15	0.67	*0.09*	0.56	*0.13*	0.40	*0.01*	<0.01	-	<0.01	-	<0.01	-

Table 9-235. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.13	*0.03*	0.15	*0.02*	0.16	*0.02*	0.05	*<0.01*	0.46	*0.02*	0.12	*0.01*
	4-8	0.17	*0.04*	0.23	*0.13*	0.12	*0.06*	0.05	*0.02*	0.29	*0.12*	0.11	*0.02*
	8-15	0.15	*0.02*	0.12	*0.02*	0.15	*0.15*	0.06	*0.01*	0.36	*0.11*	0.10	*<0.01*
Seawater	**0-4**	0.13	*0.03*	0.20	*0.08*	0.19	*0.06*	0.05	*<0.01*	0.17	*0.10*	0.12	*0.02*
	4-8	0.17	*0.04*	0.16	*0.04*	0.15	*0.01*	0.05	*0.02*	0.18	*0.10*	0.11	*<0.01*
	8-15	0.15	*0.02*	0.12	*0.10*	0.10	*0.06*	0.06	*0.01*	0.20	*0.10*	0.12	*0.02*

Table 9-236. Selected sediment properties before and after inundation of the Milang soil material (Site 11): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.35	*0.06*	0.40	*0.03*	0.40	*0.01*
	4-8	0.37	*0.08*	0.45	*0.02*	0.37	*0.01*
	8-15	0.34	*0.10*	0.36	*0.04*	0.33	*0.11*
Seawater	**0-4**	0.35	*0.06*	0.45	*0.01*	0.40	*0.00*
	4-8	0.37	*0.08*	0.45	*0.02*	0.43	*0.03*
	8-15	0.34	*0.10*	0.41	*0.05*	0.44	*0.06*

Table 9-237. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.060	*0.008*	0.008	*0.003*	0.034	*0.030*	0.001	*0.001*	0.022	-	0.024	*0.014*
	4-8	0.100	*0.045*	0.053	*0.105*	0.068	*0.002*	0.002	*<0.001*	0.002	-	0.001	*0.002*
	8-15	0.073	*0.021*	0.111	-	0.083	*0.003*	0.002	*<0.001*	0.002	-	<0.001	-
Seawater	**0-4**	0.060	*0.008*	0.039	*0.015*	0.038	*0.006*	0.001	*0.001*	0.018	*0.004*	0.025	*0.002*
	4-8	0.100	*0.045*	0.109	*0.062*	0.139	*0.017*	0.002	*<0.001*	0.003	-	0.003	*<0.001*
	8-15	0.073	*0.021*	0.115	-	0.327	*0.440*	0.002	*<0.001*	0.002	-	0.032	*0.057*

Table 9-238. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.002	*<0.001*	0.012	-	0.017	*0.008*	0.955	*0.568*	0.939	*0.409*	0.376	*0.054*
	4-8	0.002	*0.001*	0.004	-	0.004	*0.002*	0.630	*0.044*	0.939	*0.013*	0.393	*0.166*
	8-15	0.003	*0.002*	0.003	-	0.006	*0.003*	0.414	*0.044*	0.965	*0.180*	0.387	*0.021*
Seawater	**0-4**	0.002	*<0.001*	0.011	*0.003*	0.015	*0.003*	0.955	*0.568*	6.991	*0.479*	4.785	*0.211*
	4-8	0.002	*0.001*	0.003	-	0.002	*0.001*	0.630	*0.044*	3.929	*0.290*	4.285	*0.560*
	8-15	0.003	*0.002*	0.003	-	0.002	*0.001*	0.414	*0.044*	3.426	*1.122*	4.439	*0.543*

Table 9-239. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.00	-	0.00	-	0.00	-	4.20	*1.54*	8.85	*10.33*	9.26	*9.91*
	4-8	0.00	-	0.00	-	0.00	-	25.77	*3.54*	11.21	*2.81*	17.09	*9.63*
	8-15	0.00	-	0.00	-	0.00	-	19.05	*3.70*	14.89	*5.02*	12.89	*5.02*
Seawater	**0-4**	0.00	-	0.00	-	0.00	-	4.20	*1.54*	4.23	*0.76*	3.99	*0.06*
	4-8	0.00	-	0.00	-	0.00	-	25.77	*3.54*	14.90	*1.63*	14.44	*1.52*
	8-15	0.00	-	0.00	-	0.00	-	19.05	*3.70*	23.39	*0.53*	28.53	*1.47*

Table 9-240. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.81	*0.35*	1.40	*1.33*	1.31	*1.24*	0.25	*0.15*	0.22	*0.07*	0.15	*<0.01*
	4-8	3.28	*0.31*	1.50	*0.30*	2.27	*1.06*	0.12	*0.01*	0.13	*0.04*	0.10	*0.04*
	8-15	2.36	*0.38*	1.90	*0.59*	1.65	*0.54*	0.05	*0.02*	0.09	*0.04*	0.03	*0.02*
Seawater	**0-4**	0.81	*0.35*	0.83	*0.05*	0.68	*0.07*	0.25	*0.15*	0.25	*0.03*	0.21	*0.05*
	4-8	3.28	*0.31*	1.88	*0.30*	1.72	*0.25*	0.12	*0.01*	0.15	*0.03*	0.12	*0.01*
	8-15	2.36	*0.38*	2.95	*0.06*	3.22	*0.13*	0.05	*0.02*	0.12	*0.07*	0.10	*0.02*

Table 9-241. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.01	*<0.01*	0.03	*0.01*	0.02	*0.01*	0.07	*0.01*	0.08	*0.03*	0.08	*<0.01*
	4-8	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.18	*0.01*	0.10	*0.04*	0.13	*0.09*
	8-15	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.13	*0.01*	0.13	*0.00*	0.11	*0.03*
Seawater	0-4	0.01	*<0.01*	0.03	*<0.01*	0.04	*0.01*	0.07	*0.01*	0.10	*0.02*	0.11	*0.01*
	4-8	0.01	*<0.01*	0.01	*<0.01*	0.03	*<0.01*	0.18	*0.01*	0.16	*0.03*	0.18	*0.04*
	8-15	<0.01	-	<0.01	-	0.02	*0.01*	0.13	*0.01*	0.17	*0.01*	0.20	*0.05*

Table 9-242. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	432	*306*	169	*53*	137	*14*	67.3	*32.6*	59.2	*12.3*	38.5	*8.5*
	4-8	217	*47*	176	*3*	132	*53*	51.2	*4.0*	51.4	*6.4*	37.9	*23.5*
	8-15	121	*11*	197	*6*	150	*31*	42.3	*4.2*	49.2	*5.7*	29.4	*6.2*
Seawater	0-4	432	*306*	2728	*173*	3151	*108*	67.3	*32.6*	176.5	*14.5*	173.6	*9.9*
	4-8	217	*47*	1460	*42*	2910	*332*	51.2	*4.0*	99.2	*4.8*	140.0	*12.2*
	8-15	121	*11*	1245	*435*	2897	*468*	42.3	*4.2*	78.9	*6.1*	138.1	*21.2*

Table 9-243. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	140.4	*43.2*	205.9	*49.7*	112.9	*48.3*	47.7	*26.3*	52.6	*25.4*	45.1	*2.8*
	4-8	161.4	*1.3*	167.8	*8.7*	112.3	*22.7*	46.0	*4.1*	44.7	*3.0*	45.9	*19.8*
	8-15	112.4	*1.0*	169.4	*57.1*	111.6	*27.9*	29.6	*2.7*	49.7	*12.9*	40.1	*5.1*
Seawater	0-4	140.4	*43.2*	304.0	*37.7*	290.7	*0.5*	47.7	*26.3*	204.0	*27.8*	262.1	*40.2*
	4-8	161.4	*1.3*	288.4	*27.8*	322.3	*64.1*	46.0	*4.1*	116.2	*6.0*	250.8	*23.5*
	8-15	112.4	*1.0*	267.2	*39.6*	371.7	*121.2*	29.6	*2.7*	119.7	*43.8*	275.4	*36.7*

Table 9-244. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	664	*469*	297	*138*	166	*31*	428	*242*	479	*240*	446	*135*
	4-8	317	*114*	279	*35*	162	*55*	534	*21*	446	*101*	406	*172*
	8-15	161	*17*	323	*15*	197	*44*	373	*23*	496	*225*	367	*56*
Seawater	0-4	664	*469*	4999	*485*	6210	*251*	428	*242*	1081	*83*	1054	*40*
	4-8	317	*114*	2474	*130*	5541	*946*	534	*21*	867	*70*	1178	*225*
	8-15	161	*17*	2172	*774*	5618	*1035*	373	*23*	716	*117*	1221	*384*

Table 9-245. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	2441	*112*	2342	*879*	1680	*149*	3585	*33*	3331	*682*	3019	*7*
	4-8	2657	*591*	2414	*990*	2135	*1175*	3875	*625*	3081	*1278*	3407	*2041*
	8-15	1778	*222*	2058	*3*	1487	*301*	2574	*241*	2784	*113*	2514	*578*
Seawater	**0-4**	2441	*112*	1808	*54*	1916	*49*	3585	*33*	2998	*105*	3359	*1*
	4-8	2657	*591*	1960	*422*	1881	*128*	3875	*625*	3103	*334*	3585	*412*
	8-15	1778	*222*	1864	*211*	1929	*787*	2574	*241*	2882	*292*	3676	*1481*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-246. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	69.3	*53.4*	95.8	*43.3*	80.9	*40.4*	2.78	*0.19*	2.10	*0.53*	1.76	*0.23*
	4-8	120.3	*9.9*	69.1	*17.2*	85.8	*37.4*	5.12	*0.35*	2.58	*1.99*	3.25	*3.28*
	8-15	81.6	*17.4*	78.7	*17.0*	67.0	*18.7*	3.05	*0.46*	3.00	*0.13*	2.37	*1.12*
Seawater	**0-4**	69.3	*53.4*	51.5	*5.9*	52.4	*1.2*	2.78	*0.19*	2.33	*0.15*	2.25	*0.03*
	4-8	120.3	*9.9*	73.2	*3.3*	75.0	*8.1*	5.12	*0.35*	3.82	*0.29*	4.03	*0.52*
	8-15	81.6	*17.4*	110.2	*5.0*	120.9	*40.1*	3.05	*0.46*	4.13	*0.18*	4.96	*0.98*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-247. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1.99	*0.14*	2.50	*0.50*	4.80	*6.92*	2.36	*0.31*	11.02	*9.51*	4.51	*1.94*
	4-8	1.86	*0.04*	2.28	*0.05*	3.32	*2.84*	4.42	*0.01*	4.14	*1.55*	4.28	*2.52*
	8-15	1.36	*0.14*	1.97	*0.64*	3.73	*4.57*	3.10	*0.55*	7.08	*7.42*	3.11	*0.75*
Seawater	**0-4**	1.99	*0.14*	1.92	*0.12*	1.88	*0.05*	2.36	*0.31*	2.17	*0.06*	3.50	*0.03*
	4-8	1.86	*0.04*	1.62	*0.21*	1.68	*0.01*	4.42	*0.01*	2.84	*0.50*	4.37	*1.17*
	8-15	1.36	*0.14*	1.41	*0.09*	1.60	*0.92*	3.10	*0.55*	3.52	*0.13*	5.31	*2.00*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-248. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	6.20	*0.07*	5.22	*1.02*	5.18	*1.93*	0.03	*0.01*	0.03	*0.01*	0.02	*<0.01*
	4-8	6.17	*0.54*	5.09	*2.19*	4.87	*0.87*	0.04	*0.01*	0.03	*0.02*	0.03	*0.03*
	8-15	4.75	*0.17*	4.19	*0.04*	4.02	*1.68*	0.03	*<0.01*	0.04	*0.02*	0.02	*0.01*
Seawater	**0-4**	6.20	*0.07*	4.13	*0.18*	7.32	*1.28*	0.03	*0.01*	0.04	*0.03*	0.02	*<0.01*
	4-8	6.17	*0.54*	3.90	*0.55*	4.78	*0.05*	0.04	*0.01*	0.03	*0.01*	0.03	*0.01*
	8-15	4.75	*0.17*	3.52	*0.08*	5.26	*2.79*	0.03	*<0.01*	0.04	*<0.01*	0.05	*0.03*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-249. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.33	*<0.01*	1.49	*0.02*	1.24	*0.12*	4.07	*0.65*	6.86	-	4.64	*0.40*
	4-8	1.12	*0.14*	1.27	*0.39*	1.15	*0.28*	5.21	*0.45*	6.30	*2.68*	5.21	*3.00*
	8-15	0.78	*0.05*	1.04	*<0.01*	0.83	*0.01*	3.83	*0.24*	6.12	*2.27*	3.88	*0.47*
Seawater	0-4	1.33	*<0.01*	1.31	*0.07*	1.45	*<0.01*	4.07	*0.65*	3.48	*0.00*	5.75	*0.15*
	4-8	1.12	*0.14*	1.05	*0.20*	1.19	*0.01*	5.21	*0.45*	4.35	*0.75*	6.17	*1.30*
	8-15	0.78	*0.05*	0.90	*0.03*	1.09	*0.42*	3.83	*0.24*	4.59	*0.13*	6.50	*2.88*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-250. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	2.26	*0.45*	2.41	*0.58*	1.77	*0.18*
	4-8	2.00	*0.26*	2.07	*0.43*	1.75	*0.64*
	8-15	1.67	*0.27*	2.00	*0.05*	1.34	*0.07*
Seawater	0-4	2.26	*0.45*	1.98	*0.04*	2.02	*0.07*
	4-8	2.00	*0.26*	1.85	*0.17*	1.83	*0.11*
	8-15	1.67	*0.27*	1.73	*0.10*	1.74	*0.70*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-251. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	248	*1*	232	*111*	80	*21*	845	*13*	981	*145*	958	*93*
	4-8	374	*64*	277	*54*	117	*45*	584	*101*	488	*176*	534	*158*
	8-15	276	*<1*	277	*16*	86	*19*	338	*77*	413	*3*	326	*12*
Seawater	0-4	248	*1*	341	*14*	130	*8*	845	*13*	1084	*36*	1118	*108*
	4-8	374	*64*	335	*24*	167	*12*	584	*101*	666	*62*	574	*3*
	8-15	276	*<1*	350	*144*	232	*120*	338	*77*	587	*204*	620	*305*

Table 9-252. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	48.8	*36.8*	80.5	*50.6*	56.4	*31.2*	1.22	*0.14*	1.04	*0.56*	0.82	*0.32*
	4-8	80.8	*7.9*	53.7	*3.9*	58.5	*16.9*	1.66	*0.10*	0.83	*0.43*	1.17	*1.06*
	8-15	55.1	*7.4*	63.2	*4.2*	41.9	*5.5*	1.06	*0.53*	1.12	*0.27*	0.95	*0.22*
Seawater	0-4	48.8	*36.8*	38.1	*5.5*	36.3	*8.1*	1.22	*0.14*	1.15	*0.04*	1.48	*0.02*
	4-8	80.8	*7.9*	60.1	*11.4*	54.3	*11.8*	1.66	*0.10*	1.28	*0.20*	2.05	*0.64*
	8-15	55.1	*7.4*	88.4	*1.9*	107.1	*35.8*	1.06	*0.53*	1.41	*0.23*	2.02	*1.07*

Table 9-253. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.05	*0.07*	1.24	*0.50*	1.47	*1.70*	0.89	*0.22*	1.55	*1.23*	1.10	*0.71*
	4-8	0.77	*0.17*	1.05	*0.03*	1.10	*0.77*	3.17	*0.88*	1.85	*0.10*	1.84	*0.66*
	8-15	0.64	*0.16*	0.84	*0.25*	0.97	*0.49*	2.67	*1.01*	2.06	*0.40*	1.38	*0.40*
Seawater	0-4	1.05	*0.07*	0.98	*0.12*	1.00	*0.09*	0.89	*0.22*	0.78	*0.05*	0.90	*0.01*
	4-8	0.77	*0.17*	1.03	*0.12*	0.84	*0.06*	3.17	*0.88*	2.96	*0.43*	1.96	*0.28*
	8-15	0.64	*0.16*	0.83	*0.10*	0.75	*0.29*	2.67	*1.01*	4.09	*0.29*	3.73	*0.89*

Table 9-254. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.57	*0.73*	1.40	*0.31*	1.57	*1.52*	0.01	*<0.01*	0.02	*0.01*	0.01	*<0.01*
	4-8	0.87	*0.35*	1.14	*<0.01*	1.09	*0.62*	0.03	*<0.01*	0.02	*<0.01*	0.03	*0.01*
	8-15	0.70	*0.03*	0.90	*0.27*	0.89	*0.49*	0.02	*<0.01*	0.02	*0.01*	0.01	*<0.01*
Seawater	0-4	1.57	*0.73*	1.46	*0.07*	1.23	*0.12*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	0.87	*0.35*	1.61	*0.12*	0.93	*0.09*	0.03	*<0.01*	0.02	*<0.01*	0.02	*<0.01*
	8-15	0.70	*0.03*	1.43	*0.44*	0.84	*0.29*	0.02	*<0.01*	0.04	*0.01*	0.04	*0.01*

Table 9-255. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.50	*0.04*	0.46	*0.13*	0.36	*0.06*	0.34	*0.03*	0.62	*0.65*	0.51	*0.30*
	4-8	0.41	*0.02*	0.40	*0.06*	0.33	*0.04*	1.27	*0.14*	0.86	*<0.01*	0.94	*0.21*
	8-15	0.30	*0.08*	0.32	*0.03*	0.22	*<0.01*	1.08	*0.21*	0.96	*0.09*	0.71	*0.09*
Seawater	0-4	0.50	*0.04*	0.51	*0.03*	0.43	*0.05*	0.34	*0.03*	0.35	*0.03*	0.47	*0.02*
	4-8	0.41	*0.02*	0.53	*0.06*	0.43	*<0.01*	1.27	*0.14*	1.23	*0.03*	1.05	*0.22*
	8-15	0.30	*0.08*	0.51	*0.11*	0.46	*0.16*	1.08	*0.21*	1.77	*0.67*	1.76	*0.55*

Table 9-256. Selected sediment properties before and after inundation of the Ewe Island Barrage soil material (Site 12): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.02	*0.16*	1.09	*0.11*	0.95	*0.08*
	4-8	0.82	*0.36*	0.93	*0.01*	0.98	*0.13*
	8-15	0.56	*0.08*	0.73	*0.19*	0.69	*0.05*
Seawater	0-4	1.02	*0.16*	1.11	*0.01*	1.14	*0.12*
	4-8	0.82	*0.36*	1.01	*0.13*	0.97	*0.23*
	8-15	0.56	*0.08*	0.92	*0.13*	0.88	*0.34*

Table 9-257. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.002	*0.001*	0.001	-	0.001	*<0.001*	0.001	*<0.001*	<0.001	-	<0.001	-
	4-8	0.003	*0.001*	<0.001	-	0.001	*0.001*	0.001	*<0.001*	0.012	-	<0.001	-
	8-15	0.025	*0.003*	0.024	*<0.001*	0.034	*0.066*	0.002	*<0.001*	<0.001	-	<0.001	-
Seawater	0-4	0.002	*0.001*	<0.001	-	0.001	*<0.001*	0.001	*<0.001*	0.001	-	<0.001	-
	4-8	0.003	*0.001*	0.002	-	0.001	*0.000*	0.001	*<0.001*	<0.001	-	<0.001	-
	8-15	0.025	*0.003*	0.048	*0.009*	0.065	*0.109*	0.002	*<0.001*	<0.001	-	<0.001	-

Table 9-258. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	<0.001	-	0.885	*0.094*	0.717	*0.069*	0.244	*0.045*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.919	*0.138*	1.284	*0.082*	0.562	*0.265*
	8-15	0.003	*0.002*	0.001	*0.002*	0.002	*0.001*	2.278	*0.761*	3.702	*1.297*	1.579	*0.493*
Seawater	0-4	<0.001	-	<0.001	-	<0.001	-	0.885	*0.094*	5.600	*0.000*	3.264	*0.859*
	4-8	<0.001	-	<0.001	-	<0.001	-	0.919	*0.138*	4.075	*0.224*	3.164	*0.094*
	8-15	0.003	*0.002*	0.002	-	0.009	*0.004*	2.278	*0.761*	4.427	*0.224*	5.696	*1.573*

Table 9-259. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): TAA and ANC.

		TAA (mol H^+/t)						ANC (% $CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	6.55	*2.69*	3.93	*0.39*	3.84	*0.51*	0.00	-	0.00	-	0.00	-
	4-8	11.79	*3.02*	8.39	*2.21*	9.19	*8.52*	0.00	-	0.00	-	0.00	-
	8-15	56.33	*30.12*	54.71	*24.66*	44.17	*26.98*	0.00	-	0.00	-	0.00	-
Seawater	0-4	6.55	*2.69*	2.14	*0.77*	2.01	*0.59*	0.00	-	0.02	*0.04*	0.01	*0.01*
	4-8	11.79	*3.02*	4.53	*1.40*	5.04	*4.67*	0.00	-	0.00	-	0.01	*0.02*
	8-15	56.33	*30.12*	38.72	*2.40*	36.49	*16.58*	0.00	-	0.00	-	0.00	-

Table 9-260. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.17	*0.06*	0.17	*0.02*	0.14	*0.03*	0.14	*0.08*	0.10	*0.02*	0.08	*0.01*
	4-8	0.21	*0.02*	0.23	*0.01*	0.18	*0.17*	0.15	*0.05*	0.12	*0.07*	0.13	*0.15*
	8-15	0.84	*0.39*	0.85	*0.38*	0.67	*0.24*	0.74	*0.38*	0.70	*0.36*	0.57	*0.28*
Seawater	0-4	0.17	*0.06*	0.20	*0.06*	0.15	*0.02*	0.14	*0.08*	0.14	*0.01*	0.12	*0.02*
	4-8	0.21	*0.02*	0.19	*0.02*	0.21	*0.02*	0.15	*0.05*	0.11	*0.01*	0.16	*0.03*
	8-15	0.84	*0.39*	0.67	*0.16*	0.64	*0.15*	0.74	*0.38*	0.62	*0.08*	0.64	*0.15*

Table 9-261. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.04	0.01	0.01	<0.01	0.01	<0.01	0.06	0.02	0.04	0.01	0.03	0.01
	4-8	0.06	0.02	0.01	<0.01	0.01	0.01	0.08	0.03	0.06	0.02	0.06	0.04
	8-15	0.21	0.08	0.06	0.03	0.05	0.02	0.27	0.09	0.27	0.13	0.21	0.03
Seawater	**0-4**	0.04	0.01	0.01	<0.01	0.02	<0.01	0.06	0.02	0.05	0.01	0.06	0.02
	4-8	0.06	0.02	0.01	0.01	0.02	<0.01	0.08	0.03	0.06	0.02	0.07	0.03
	8-15	0.21	0.08	0.05	0.01	0.07	0.02	0.27	0.09	0.19	0.02	0.27	0.06

Table 9-262. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	355	24	171	11	102	20	32.8	1.5	32.9	0.2	11.0	1.6
	4-8	363	41	301	39	225	100	46.3	0.1	48.8	3.7	24.2	18.7
	8-15	850	291	922	271	589	184	114.0	27.1	139.8	32.3	94.7	33.6
Seawater	**0-4**	355	24	2188	136	2084	493	32.8	1.5	98.7	2.1	81.9	14.5
	4-8	363	41	1596	27	2030	230	46.3	0.1	85.7	4.8	77.2	4.0
	8-15	850	291	1511	35	3154	1094	114.0	27.1	138.6	2.3	145.9	12.0

Table 9-263. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	109.9	6.4	58.6	3.3	20.4	4.3	88.5	13.5	54.0	11.2	26.6	8.7
	4-8	92.4	13.6	86.6	1.3	52.3	32.8	106.1	13.1	112.6	10.9	84.2	43.2
	8-15	256.2	36.3	255.1	99.2	165.5	59.8	290.8	137.9	359.4	170.4	267.5	71.6
Seawater	**0-4**	109.9	6.4	126.6	13.2	93.9	44.7	88.5	13.5	247.0	15.2	247.9	57.4
	4-8	92.4	13.6	103.3	14.1	110.8	1.1	106.1	13.1	194.5	14.6	248.5	15.3
	8-15	256.2	36.3	206.2	44.4	262.7	28.0	290.8	137.9	288.1	74.7	454.6	26.7

Table 9-264. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	404	29	197	4	103	5	1022	125	522	128	243	59
	4-8	360	19	265	6	146	53	1200	210	1055	128	732	392
	8-15	821	309	778	211	363	113	3323	1425	3299	1455	2436	748
Seawater	**0-4**	404	29	3802	112	3916	1159	1022	125	945	95	765	294
	4-8	360	19	2658	103	3621	582	1200	210	992	110	1114	140
	8-15	821	309	2169	103	6074	2843	3323	1425	2451	846	2752	330

Table 9-265. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	1183	*276*	1294	*82*	982	*107*	1570	*460*	1675	*57*	1696	*111*
	4-8	2148	*473*	1905	*662*	1583	*1254*	2434	*771*	2083	*852*	2046	*1699*
	8-15	8065	*1887*	8485	*3719*	5374	*2089*	8415	*1901*	8649	*3675*	6203	*2029*
Seawater	**0-4**	1183	*276*	995	*183*	1026	*241*	1570	*460*	1516	*363*	1850	*431*
	4-8	2148	*473*	1449	*265*	1594	*435*	2434	*771*	1801	*396*	2033	*597*
	8-15	8065	*1887*	5127	*567*	5721	*789*	8415	*1901*	5873	*825*	6622	*825*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-266. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	9.8	*2.2*	11.4	*0.2*	8.2	*0.5*	0.65	*0.12*	0.49	*0.07*	0.35	*0.10*
	4-8	13.8	*3.8*	15.4	*4.3*	11.6	*5.1*	0.60	*0.17*	0.17	*0.07*	0.32	*0.34*
	8-15	39.4	*12.0*	44.3	*18.8*	33.7	*1.8*	2.22	*0.51*	2.05	*1.23*	1.46	*0.14*
Seawater	**0-4**	9.8	*2.2*	7.2	*0.9*	8.1	*0.4*	0.65	*0.12*	0.55	*0.10*	0.40	*0.10*
	4-8	13.8	*3.8*	9.5	*1.5*	11.5	*4.6*	0.60	*0.17*	0.64	*0.08*	0.22	*0.03*
	8-15	39.4	*12.0*	31.3	*7.6*	35.9	*12.3*	2.22	*0.51*	1.46	*0.06*	1.67	*0.06*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-267. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.99	*0.14*	1.24	*0.04*	0.99	*0.13*	0.81	*0.26*	3.33	*4.33*	2.09	*2.40*
	4-8	1.59	*0.18*	2.03	*0.19*	1.39	*1.15*	1.36	*0.37*	1.95	-	1.35	*0.96*
	8-15	5.41	*1.08*	6.09	*2.88*	5.29	*0.34*	4.80	*1.54*	4.17	-	4.15	*1.06*
Seawater	**0-4**	0.99	*0.14*	1.05	*0.23*	1.00	*0.06*	0.81	*0.26*	0.72	*0.10*	1.40	*0.23*
	4-8	1.59	*0.18*	1.22	*0.18*	1.52	*0.13*	1.36	*0.37*	0.97	*0.18*	4.13	*5.92*
	8-15	5.41	*1.08*	4.49	*0.95*	4.75	*0.01*	4.80	*1.54*	3.72	*0.70*	6.18	*1.34*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-268. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	3.88	*0.72*	2.41	*0.23*	2.15	*0.40*	0.01	*<0.01*	0.02	*<0.01*	0.01	*0.01*
	4-8	5.04	*0.63*	3.48	*1.12*	3.20	*1.98*	0.01	*<0.01*	0.02	*0.01*	0.01	*0.01*
	8-15	12.74	*2.32*	13.06	*6.30*	9.40	*2.55*	0.03	*0.01*	0.02	*0.01*	0.02	*0.01*
Seawater	**0-4**	3.88	*0.72*	1.75	*0.44*	2.51	*0.45*	0.01	*<0.01*	0.02	*<0.01*	0.01	*<0.01*
	4-8	5.04	*0.63*	2.60	*0.49*	3.78	*0.97*	0.01	*<0.01*	0.02	*<0.01*	0.01	*<0.01*
	8-15	12.74	*2.32*	8.95	*1.49*	12.34	*2.99*	0.03	*0.01*	0.02	*<0.01*	0.02	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-269. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.30	*0.08*	0.35	*<0.01*	0.30	*0.01*	2.04	*0.49*	3.39	*1.30*	5.22	*5.11*
	4-8	0.50	*0.12*	0.51	*0.20*	0.42	*0.33*	3.21	*0.73*	6.34	*5.63*	2.94	*1.61*
	8-15	1.71	*0.52*	1.79	*0.70*	1.41	*0.12*	9.76	*2.46*	12.39	*7.51*	8.55	*3.21*
Seawater	0-4	0.30	*0.08*	0.26	*0.05*	0.30	*0.03*	2.04	*0.49*	1.97	*0.12*	3.27	*1.33*
	4-8	0.50	*0.12*	0.36	*0.11*	0.48	*0.19*	3.21	*0.73*	2.44	*0.31*	4.76	*2.92*
	8-15	1.71	*0.52*	1.23	*0.28*	1.52	*0.01*	9.76	*2.46*	7.84	*1.05*	11.12	*0.82*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-270. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.28	*0.03*	1.56	*0.20*	1.28	*0.03*
	4-8	1.63	*0.08*	1.93	*0.27*	1.65	*0.30*
	8-15	4.09	*0.65*	4.11	*1.76*	3.24	*0.59*
Seawater	0-4	1.28	*0.03*	1.64	*0.35*	1.54	*0.70*
	4-8	1.63	*0.08*	1.53	*0.12*	1.52	*0.55*
	8-15	4.09	*0.65*	3.40	*0.11*	3.56	*0.51*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-271. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	134	*5*	141	*2*	38	*1*	204	*39*	277	*30*	210	*9*
	4-8	192	*13*	202	*24*	80	*71*	216	*38*	296	*56*	244	*227*
	8-15	506	*88*	531	*192*	273	*85*	661	*164*	887	*324*	762	*229*
Seawater	0-4	134	*5*	171	*5*	37	*5*	204	*39*	595	*65*	267	*19*
	4-8	192	*13*	207	*0*	74	*30*	216	*38*	522	*22*	235	*53*
	8-15	506	*88*	566	*105*	304	*61*	661	*164*	1408	*192*	755	*49*

Table 9-272. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.1	*0.9*	2.9	*0.3*	1.3	*0.2*	0.28	*<0.01*	0.38	*0.05*	0.17	*0.05*
	4-8	4.4	*1.3*	5.0	*0.7*	3.7	*3.0*	0.26	*0.09*	0.28	*0.07*	0.16	*0.15*
	8-15	13.6	*5.5*	17.9	*9.1*	10.9	*2.0*	0.91	*0.27*	0.92	*0.39*	0.49	*0.03*
Seawater	0-4	3.1	*0.9*	1.7	*0.1*	1.3	*0.5*	0.28	*<0.01*	0.38	*0.05*	0.20	*0.02*
	4-8	4.4	*1.3*	2.5	*0.6*	3.3	*1.8*	0.26	*0.09*	0.29	*0.08*	0.21	*0.07*
	8-15	13.6	*5.5*	10.8	*4.1*	12.1	*4.3*	0.91	*0.27*	0.71	*0.13*	0.70	*0.12*

Table 9-273. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.43	*0.05*	0.50	*0.06*	0.23	*0.01*	0.19	*0.05*	0.28	*0.06*	0.07	*<0.01*
	4-8	0.67	*0.24*	0.85	*0.03*	0.46	*0.45*	0.25	*0.07*	0.42	*<0.01*	0.17	*0.15*
	8-15	2.32	*0.22*	2.65	*1.01*	2.39	*0.35*	0.75	*0.27*	0.92	*0.36*	0.63	*0.08*
Seawater	0-4	0.43	*0.05*	0.61	*0.12*	0.34	*<0.01*	0.19	*0.05*	0.24	*0.05*	0.08	*0.02*
	4-8	0.67	*0.24*	0.65	*0.07*	0.59	*0.02*	0.25	*0.07*	0.23	*0.05*	0.17	*0.08*
	8-15	2.32	*0.22*	2.24	*0.48*	2.25	*0.30*	0.75	*0.27*	0.72	*0.20*	0.62	*0.27*

Table 9-274. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.88	*0.15*	0.61	*0.02*	0.33	*0.04*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.03	*0.23*	1.04	*0.31*	0.59	*0.47*	<0.01	-	<0.01	-	<0.01	-
	8-15	2.38	*0.64*	2.70	*1.15*	1.91	*0.69*	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*
Seawater	0-4	0.88	*0.15*	0.65	*0.08*	0.38	*<0.01*	<0.01	-	<0.01	-	<0.01	-
	4-8	1.03	*0.23*	0.81	*0.20*	0.61	*0.02*	<0.01	-	<0.01	-	<0.01	-
	8-15	2.38	*0.64*	2.21	*0.57*	1.85	*0.28*	0.01	*0.01*	0.01	*0.01*	0.01	*<0.01*

Table 9-275. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.07	*0.02*	0.06	*<0.01*	0.03	*0.01*	0.12	*0.05*	0.10	*0.07*	0.10	*0.02*
	4-8	0.12	*0.04*	0.12	*0.02*	0.08	*0.09*	0.13	*0.04*	0.16	*0.06*	0.13	*0.04*
	8-15	0.34	*0.10*	0.38	*0.16*	0.31	*0.05*	0.38	*0.06*	0.34	*0.19*	0.24	*0.03*
Seawater	0-4	0.07	*0.02*	0.06	*0.01*	0.03	*<0.01*	0.12	*0.05*	0.12	*0.06*	0.12	*0.04*
	4-8	0.12	*0.04*	0.09	*0.03*	0.08	*<0.01*	0.13	*0.04*	0.13	*0.05*	0.12	*0.01*
	8-15	0.34	*0.10*	0.34	*0.12*	0.36	*0.10*	0.38	*0.06*	0.45	*0.04*	0.26	*0.08*

Table 9-276. Selected sediment properties before and after inundation of the Currency Creek soil material (Site 13): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.18	*0.03*	0.28	*0.03*	0.11	*0.01*
	4-8	0.16	*0.01*	0.29	*<0.01*	0.21	*0.14*
	8-15	0.26	*0.01*	0.45	*0.07*	0.33	*0.04*
Seawater	0-4	0.18	*0.03*	0.89	*0.47*	0.24	*0.08*
	4-8	0.16	*0.01*	0.64	*0.04*	0.25	*0.01*
	8-15	0.26	*0.01*	1.35	*0.11*	0.50	*0.21*

Table 9-277. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.002	*<0.001*	0.004	-	0.004	*0.002*	0.001	*0.001*	<0.001	-	<0.001	-
	4-8	0.003	*0.001*	0.005	-	0.006	*0.005*	0.001	*0.001*	<0.001	-	<0.001	-
	8-15	0.002	*0.001*	0.003	-	0.010	*0.009*	0.002	*<0.001*	<0.001	-	<0.001	-
Seawater	0-4	0.002	*<0.001*	0.002	-	0.002	*0.002*	0.001	*0.001*	<0.001	-	<0.001	-
	4-8	0.003	*0.001*	0.005	-	0.021	*0.031*	0.001	*0.001*	<0.001	-	<0.001	-
	8-15	0.002	*0.001*	0.002	-	0.002	*0.004*	0.002	*<0.001*	<0.001	-	<0.001	-

Table 9-278. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	0.003	*0.001*	0.648	*0.361*	0.922	*0.278*	0.460	*0.147*
	4-8	<0.001	-	<0.001	-	0.002	*0.001*	0.701	*0.021*	1.683	*0.182*	1.073	*0.961*
	8-15	<0.001	-	<0.001	-	0.003	*0.003*	0.944	*0.088*	2.054	*0.054*	1.075	*0.497*
Seawater	0-4	<0.001	-	<0.001	-	0.001	*<0.001*	0.648	*0.361*	5.466	*0.153*	4.010	*1.078*
	4-8	<0.001	-	<0.001	-	0.001	*<0.001*	0.701	*0.021*	4.477	*1.325*	3.677	*0.717*
	8-15	<0.001	-	<0.001	-	<0.001	-	0.944	*0.088*	3.914	*0.073*	2.658	*0.115*

Table 9-279. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	8.28	*3.46*	13.90	*7.82*	7.28	*4.50*	0.00	-	0.00	-	0.00	-
	4-8	8.24	*1.65*	18.87	*12.41*	9.04	*1.12*	0.00	-	0.00	-	0.00	-
	8-15	11.35	*3.81*	13.43	*5.48*	9.32	*0.26*	0.00	-	0.00	-	0.00	-
Seawater	0-4	8.28	*3.46*	6.56	*3.76*	3.74	*2.64*	0.00	-	0.00	-	0.00	-
	4-8	8.24	*1.65*	7.27	*0.55*	5.64	*3.02*	0.00	-	0.00	-	0.02	*0.03*
	8-15	11.35	*3.81*	6.67	*1.21*	4.66	*2.99*	0.00	-	0.00	-	0.00	-

Table 9-280. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.36	*0.23*	0.51	*0.24*	0.33	*0.06*	0.29	*0.23*	0.38	*0.24*	0.17	*0.06*
	4-8	0.36	*0.14*	0.66	*0.47*	0.29	*0.16*	0.29	*0.07*	0.52	*0.42*	0.25	*0.07*
	8-15	0.33	*0.02*	0.38	*0.12*	0.39	*0.23*	0.26	*0.07*	0.28	*0.11*	0.27	*0.16*
Seawater	0-4	0.36	*0.23*	0.45	*0.13*	0.33	*0.01*	0.29	*0.23*	0.37	*0.12*	0.27	*0.14*
	4-8	0.36	*0.14*	0.48	*0.19*	0.36	*0.12*	0.29	*0.07*	0.41	*0.20*	0.33	*0.07*
	8-15	0.33	*0.02*	0.29	*0.06*	0.25	*0.09*	0.26	*0.07*	0.21	*0.03*	0.18	*0.05*

Table 9-281. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.04	*0.01*	0.02	*0.02*	0.02	*<0.01*	0.07	*0.02*	0.51	*0.89*	0.04	*0.01*
	4-8	0.04	*0.02*	0.03	*0.03*	0.02	*0.01*	0.05	*0.01*	0.09	*0.06*	0.05	*0.02*
	8-15	0.04	*0.01*	0.01	*0.01*	0.02	*0.01*	0.06	*0.01*	0.07	*0.01*	0.05	*0.01*
Seawater	0-4	0.04	*0.01*	0.02	*0.01*	0.03	*0.01*	0.07	*0.02*	0.07	*0.01*	0.06	*0.03*
	4-8	0.04	*0.02*	0.02	*0.01*	0.03	*0.01*	0.05	*0.01*	0.06	*0.02*	0.07	*<0.01*
	8-15	0.04	*0.01*	0.01	*<0.01*	0.02	*<0.01*	0.06	*0.01*	0.05	*<0.01*	0.04	*<0.01*

Table 9-282. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	242	*169*	232	*118*	137	*24*	23.3	*11.4*	40.9	*0.4*	18.7	*6.0*
	4-8	284	*21*	456	*13*	317	*127*	23.1	*3.0*	46.9	*7.6*	25.8	*0.6*
	8-15	410	*50*	598	*98*	341	*7*	21.1	*0.3*	39.7	*0.1*	30.4	*12.7*
Seawater	0-4	242	*169*	2125	*187*	2532	*700*	23.3	*11.4*	103.0	*3.4*	99.3	*9.0*
	4-8	284	*21*	1773	*572*	2339	*667*	23.1	*3.0*	87.4	*19.9*	109.5	*40.2*
	8-15	410	*50*	1580	*23*	1609	*64*	21.1	*0.3*	66.4	*3.6*	70.1	*7.0*

Table 9-283. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	116.0	*21.7*	58.0	*14.1*	20.7	*0.4*	38.3	*29.5*	46.8	*24.6*	20.4	*3.1*
	4-8	79.4	*13.5*	96.9	*22.5*	49.0	*28.6*	44.2	*3.1*	88.2	*10.6*	64.1	*38.0*
	8-15	80.0	*8.9*	101.4	*0.2*	50.6	*8.3*	71.5	*8.4*	110.3	*21.9*	66.2	*15.5*
Seawater	0-4	116.0	*21.7*	111.1	*3.7*	112.7	*29.5*	38.3	*29.5*	253.2	*14.1*	276.9	*57.1*
	4-8	79.4	*13.5*	101.3	*18.9*	115.2	*20.9*	44.2	*3.1*	213.7	*65.2*	252.1	*64.7*
	8-15	80.0	*8.9*	91.8	*9.7*	80.4	*7.5*	71.5	*8.4*	196.0	*17.5*	177.0	*3.5*

Table 9-284. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	355	*215*	316	*127*	162	*1*	583	*236*	547	*213*	263	*91*
	4-8	385	*2*	574	*22*	318	*132*	573	*12*	1013	*134*	722	*346*
	8-15	544	*66*	794	*143*	352	*44*	836	*15*	1154	*35*	739	*198*
Seawater	0-4	355	*215*	3826	*299*	5026	*1604*	583	*236*	985	*9*	872	*214*
	4-8	385	*2*	3056	*1071*	4452	*1268*	573	*12*	1016	*178*	984	*202*
	8-15	544	*66*	2652	*24*	3026	*60*	836	*15*	887	*34*	706	*82*

Table 9-285. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	911	*527*	1738	*732*	982	*620*	1942	*795*	2959	*1346*	2169	*1203*
	4-8	913	*19*	2182	*981*	1109	*148*	1343	*347*	2751	*1908*	1593	*555*
	8-15	1266	*468*	1584	*235*	1152	*371*	1525	*704*	1702	*494*	1603	*815*
Seawater	0-4	911	*527*	823	*169*	1017	*482*	1942	*795*	1761	*370*	2138	*1219*
	4-8	913	*19*	935	*45*	1423	*228*	1343	*347*	1139	*283*	1873	*37*
	8-15	1266	*468*	887	*62*	1028	*80*	1525	*704*	1100	*22*	1112	*147*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-286. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	9.8	*2.8*	14.6	*1.1*	8.5	*5.2*	0.95	*0.34*	1.07	*0.43*	0.80	*0.22*
	4-8	5.9	*1.1*	11.6	*2.6*	6.8	*0.6*	0.77	*0.07*	0.94	*0.97*	0.65	*0.49*
	8-15	6.9	*0.1*	9.9	*1.1*	7.2	*2.2*	0.75	*0.16*	0.64	*0.15*	0.58	*0.27*
Seawater	0-4	9.8	*2.8*	8.3	*1.5*	9.0	*4.8*	0.95	*0.34*	0.90	*0.35*	0.72	*0.04*
	4-8	5.9	*1.1*	5.3	*0.1*	8.0	*0.7*	0.77	*0.07*	0.53	*0.42*	0.89	*0.21*
	8-15	6.9	*0.1*	4.6	*0.1*	5.3	*0.6*	0.75	*0.16*	0.45	*0.07*	0.50	*0.03*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-287. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.39	*0.27*	2.59	*1.72*	1.49	-	1.64	*1.88*	4.85	*4.18*	1.72	*2.41*
	4-8	1.34	*0.20*	3.16	*3.32*	1.37	-	0.88	*0.48*	1.86	*0.24*	0.96	*0.40*
	8-15	1.59	*0.25*	2.39	*2.40*	0.77	-	1.01	*0.39*	1.64	*0.51*	1.32	*1.40*
Seawater	0-4	1.39	*0.27*	1.68	*0.61*	2.14	*2.46*	1.64	*1.88*	0.57	*0.12*	2.04	*1.15*
	4-8	1.34	*0.20*	1.49	*0.88*	2.46	*1.92*	0.88	*0.48*	0.59	*0.02*	3.73	*3.83*
	8-15	1.59	*0.25*	1.33	*0.61*	1.87	*0.71*	1.01	*0.39*	0.55	*0.06*	1.73	*0.73*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-288. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.58	*0.64*	3.69	*2.04*	3.21	-	0.01	*<0.01*	0.02	*0.01*	0.01	*<0.01*
	4-8	3.18	*0.25*	3.81	*2.32*	2.15	-	0.02	*0.01*	0.02	*0.01*	0.01	*<0.01*
	8-15	3.86	*0.07*	2.86	*1.31*	1.74	-	0.01	*0.01*	0.03	*0.02*	0.01	*0.01*
Seawater	0-4	3.58	*0.64*	1.63	*0.34*	3.49	*1.34*	0.01	*<0.01*	0.01	*<0.01*	0.01	*0.01*
	4-8	3.18	*0.25*	1.64	*0.24*	5.92	-	0.02	*0.01*	0.02	*0.01*	0.01	*0.01*
	8-15	3.86	*0.07*	1.35	*0.05*	3.34	*1.39*	0.01	*0.01*	0.02	*<0.01*	0.01	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-289. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.32	0.17	0.54	0.03	0.33	0.18	2.04	0.78	4.50	-	2.47	1.15
	4-8	0.27	0.01	0.65	0.17	0.34	0.08	1.82	0.03	5.30	2.22	2.71	0.11
	8-15	0.36	0.09	0.51	0.02	0.34	0.10	2.38	0.21	3.80	0.08	2.46	0.74
Seawater	0-4	0.32	0.17	0.28	0.06	0.32	0.14	2.04	0.78	1.69	0.29	3.40	2.13
	4-8	0.27	0.01	0.28	0.03	0.40	0.04	1.82	0.03	1.73	0.11	5.86	2.03
	8-15	0.36	0.09	0.25	0.03	0.29	0.01	2.38	0.21	1.54	0.14	3.72	0.42

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-290. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.91	0.29	2.76	0.52	2.26	-
	4-8	1.14	0.23	1.92	0.55	1.55	0.32
	8-15	1.18	0.35	1.76	0.88	1.38	-
Seawater	0-4	1.91	0.29	1.41	0.06	1.96	0.07
	4-8	1.14	0.23	1.28	0.54	1.68	0.10
	8-15	1.18	0.35	1.04	0.05	1.07	0.12

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-291. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	112	35	203	54	35	16	339	15	968	333	545	107
	4-8	113	4	262	132	41	16	199	55	910	727	428	106
	8-15	142	19	235	81	43	8	205	94	663	376	459	124
Seawater	0-4	112	35	150	50	49	3	339	15	818	422	540	107
	4-8	113	4	145	37	56	20	199	55	400	23	434	188
	8-15	142	19	144	19	35	18	205	94	412	42	334	159

Table 9-292. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.7	0.9	3.2	<0.1	1.2	0.1	0.33	0.11	0.71	0.22	0.40	0.02
	4-8	1.8	<0.1	4.5	1.4	2.0	0.1	0.38	0.01	0.77	0.58	0.29	0.15
	8-15	2.3	0.2	4.9	1.3	2.2	<0.1	0.34	0.08	0.58	0.53	0.34	0.22
Seawater	0-4	1.7	0.9	1.8	0.6	1.0	0.2	0.33	0.11	0.46	0.13	0.40	0.05
	4-8	1.8	<0.1	1.9	0.1	1.6	0.9	0.38	0.01	0.35	0.05	0.49	<0.01
	8-15	2.3	0.2	1.7	0.2	1.4	0.6	0.34	0.08	0.33	0.05	0.26	0.07

Table 9-293. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.72	*0.09*	1.45	*1.40*	0.53	-	0.10	*0.04*	0.29	*0.01*	0.08	*0.01*
	4-8	0.86	*0.09*	2.04	*2.67*	0.60	-	0.10	*0.01*	0.33	*0.14*	0.10	*0.02*
	8-15	0.92	*0.38*	2.01	*2.76*	0.41	-	0.14	*0.01*	0.55	*0.43*	0.12	*0.01*
Seawater	0-4	0.72	*0.09*	1.12	*0.47*	1.34	*1.24*	0.10	*0.04*	0.18	*0.10*	0.08	*0.01*
	4-8	0.86	*0.09*	0.96	*0.61*	2.27	*3.01*	0.10	*0.01*	0.21	*0.09*	0.10	*0.06*
	8-15	0.92	*0.38*	0.87	*0.43*	1.53	*1.42*	0.14	*0.01*	0.19	*0.06*	0.45	*0.71*

Table 9-294. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.73	*0.26*	1.17	*0.64*	0.64	-	<0.01	-	<0.01	-	<0.01	-
	4-8	0.79	*0.30*	1.45	*1.37*	0.58	-	<0.01	-	<0.01	-	<0.01	-
	8-15	0.80	*0.04*	1.48	*1.24*	0.47	-	<0.01	-	<0.01	-	<0.01	-
Seawater	0-4	0.73	*0.26*	0.67	*0.07*	0.61	*0.22*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	0.79	*0.30*	0.65	*0.03*	0.77	*0.46*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.80	*0.04*	0.75	*0.08*	0.55	*0.37*	<0.01	-	<0.01	-	<0.01	-

Table 9-295. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.08	*0.04*	0.14	*0.02*	0.06	*0.02*	0.09	*0.03*	0.20	*0.22*	0.12	*<0.01*
	4-8	0.09	*<0.01*	0.22	*0.05*	0.10	*0.02*	0.07	*0.01*	0.19	*0.31*	0.10	*0.01*
	8-15	0.13	*0.01*	0.26	*0.04*	0.11	*0.01*	0.10	*0.02*	0.53	*0.83*	0.11	*0.03*
Seawater	0-4	0.08	*0.04*	0.09	*0.04*	0.05	*<0.01*	0.09	*0.03*	0.07	*0.12*	0.14	*0.02*
	4-8	0.09	*<0.01*	0.09	*0.04*	0.08	*0.03*	0.07	*0.01*	0.11	*0.05*	0.12	*0.01*
	8-15	0.13	*0.01*	0.09	*0.01*	0.07	*0.02*	0.10	*0.02*	0.15	*0.01*	0.15	*0.09*

Table 9-296. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 14): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.58	*0.40*	1.38	*0.44*	0.65	-
	4-8	0.25	*0.10*	0.94	*0.35*	0.41	*0.01*
	8-15	0.18	*0.02*	0.68	*0.31*	0.88	*1.11*
Seawater	0-4	0.58	*0.40*	0.79	*0.15*	0.75	*0.20*
	4-8	0.25	*0.10*	0.50	*<0.01*	0.57	*<0.01*
	8-15	0.18	*0.02*	0.47	*0.05*	0.38	*0.05*

Table 9-297. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): di-sulfide (mainly pyrite) and monosulfide content.

		di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.003	*<0.001*	0.001	-	0.003	*0.002*	0.001	<0.001	<0.001	-	0.001	*0.001*
	4-8	0.002	*0.001*	<0.001	-	0.003	*0.002*	0.001	*0.001*	<0.001	-	<0.001	-
	8-15	0.015	*0.004*	0.013	*0.002*	0.021	*0.015*	0.001	<0.001	<0.001	-	<0.001	-
Seawater	0-4	0.003	*<0.001*	0.002	-	0.001	*0.002*	0.001	<0.001	<0.001	-	<0.001	-
	4-8	0.002	*0.001*	n.a.	-	0.001	*0.001*	0.001	*0.001*	<0.001	-	<0.001	-
	8-15	0.015	*0.004*	0.017	*0.005*	0.014	*0.001*	0.001	<0.001	<0.001	-	<0.001	-

Table 9-298. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): elemental sulfur content and EC.

		elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	0.001	*0.001*	0.535	*0.273*	0.488	*0.072*	0.253	*0.122*
	4-8	<0.001	-	<0.001	-	0.003	*0.001*	0.564	*0.249*	0.834	*0.146*	0.175	*0.006*
	8-15	<0.001	-	<0.001	-	0.002	*0.002*	0.711	*0.213*	1.161	*0.205*	0.266	*0.055*
Seawater	0-4	<0.001	-	<0.001	-	0.001	*0.001*	0.535	*0.273*	4.270	*0.236*	3.734	*1.189*
	4-8	<0.001	-	<0.001	-	0.001	*0.001*	0.564	*0.249*	4.184	*0.746*	2.669	*0.190*
	8-15	<0.001	-	<0.001	-	0.001	*0.001*	0.711	*0.213*	4.216	*0.027*	2.919	*1.120*

Table 9-299. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): TAA and ANC.

		TAA (mol H^+/t)						ANC (%$CaCO_3$)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.00	-	0.00	-	0.00	-	0.04	*0.08*	0.03	*0.06*	0.04	*0.07*
	4-8	0.00	-	0.00	-	0.18	*0.37*	0.00	-	0.00	-	0.00	-
	8-15	0.00	-	0.00	-	0.00	-	0.02	*0.05*	0.03	*0.01*	0.10	*0.19*
Seawater	0-4	0.00	-	0.00	-	0.00	-	0.04	*0.08*	0.07	*0.08*	0.12	*0.03*
	4-8	0.00	-	0.00	-	0.00	-	0.00	-	0.00	*0.01*	0.10	*0.08*
	8-15	0.00	-	0.00	-	0.00	-	0.02	*0.05*	0.02	*0.03*	0.16	*0.18*

Table 9-300. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total C and organic C.

		Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.14	*0.04*	0.14	*0.02*	0.08	*0.01*	0.07	*0.01*	0.10	*0.01*	0.02	*0.02*
	4-8	0.12	*0.02*	0.13	*0.04*	0.08	*<0.01*	0.01	*<0.01*	0.09	*0.04*	0.01	*0.02*
	8-15	0.09	*<0.01*	0.12	*0.03*	0.12	*0.12*	0.02	*0.02*	0.06	*0.01*	0.06	*0.12*
Seawater	0-4	0.14	*0.04*	0.14	*0.05*	0.08	*<0.01*	0.07	*0.01*	0.07	*0.01*	0.07	*0.01*
	4-8	0.12	*0.02*	0.10	*0.01*	0.07	*<0.01*	0.01	*<0.01*	0.05	*0.07*	0.06	*0.02*
	8-15	0.09	*<0.01*	0.11	*0.01*	0.07	*0.02*	0.02	*0.02*	0.06	*0.02*	0.06	*0.03*

Table 9-301. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total N and total S.

		Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.01	*<0.01*	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	4-8	0.01	*<0.01*	0.01	*0.02*	0.01	*0.01*	0.01	*<0.01*	0.01	*<0.01*	0.01	*<0.01*
	8-15	0.02	*<0.01*	0.01	*0.01*	0.01	*0.01*	0.02	*<0.01*	0.03	*<0.01*	0.03	*0.02*
Seawater	**0-4**	0.01	*<0.01*	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.02	*<0.01*	0.02	*<0.01*
	4-8	0.01	*<0.01*	<0.01	-	0.01	*<0.01*	0.01	*<0.01*	0.02	*<0.01*	0.02	*<0.01*
	8-15	0.02	*<0.01*	<0.01	-	0.01	*<0.01*	0.02	*<0.01*	0.03	*<0.01*	0.03	*<0.01*

Table 9-302. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Water soluble Na^+ and K^+.

		Na^+ (ppm)						K^+ (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	239	*140*	122	*33*	96	*11*	26.8	*4.9*	29.5	*2.0*	11.8	*1.3*
	4-8	250	*106*	248	*59*	108	*3*	26.7	*5.5*	33.3	*0.3*	11.0	*<0.1*
	8-15	327	*113*	353	*105*	151	*6*	29.7	*1.0*	37.4	*5.3*	15.2	*6.6*
Seawater	**0-4**	239	*140*	1706	*181*	2347	*774*	26.8	*4.9*	91.6	*11.1*	110.2	*12.0*
	4-8	250	*106*	1704	*363*	1680	*130*	26.7	*5.5*	86.2	*9.6*	83.2	*11.0*
	8-15	327	*113*	1745	*4*	1816	*647*	29.7	*1.0*	89.5	*3.0*	83.7	*21.4*

Table 9-303. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Water soluble Ca^{2+} and Mg^{2+}.

		Ca^{2+} (ppm)						Mg^{2+} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	73.5	*5.2*	71.9	*3.4*	40.2	*6.2*	26.2	*15.9*	23.5	*3.8*	14.5	*2.6*
	4-8	46.5	*10.0*	71.1	*20.9*	20.2	*7.4*	31.6	*19.7*	36.2	*8.5*	16.4	*0.2*
	8-15	81.3	*27.8*	104.9	*1.0*	40.6	*22.1*	43.5	*13.2*	52.1	*14.8*	27.8	*6.5*
Seawater	**0-4**	73.5	*5.2*	131.7	*19.6*	132.7	*18.9*	26.2	*15.9*	178.2	*9.6*	262.9	*68.3*
	4-8	46.5	*10.0*	114.3	*8.1*	90.0	*8.5*	31.6	*19.7*	178.8	*12.6*	194.3	*43.6*
	8-15	81.3	*27.8*	112.7	*2.2*	99.4	*13.5*	43.5	*13.2*	197.8	*18.2*	202.2	*73.8*

Table 9-304. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Water soluble Cl^- and SO_4^{2-}.

		Cl^- (ppm)						SO_4^{2-} (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	372	*221*	215	*57*	146	*16*	204	*84*	109	*23*	61	*15*
	4-8	419	*193*	426	*102*	164	*5*	209	*86*	210	*36*	76	*19*
	8-15	538	*182*	579	*187*	207	*24*	296	*81*	362	*46*	153	*81*
Seawater	**0-4**	372	*221*	3084	*308*	4702	*1669*	204	*84*	565	*63*	671	*239*
	4-8	419	*193*	3048	*605*	3260	*365*	209	*86*	566	*42*	497	*67*
	8-15	538	*182*	3102	*85*	3510	*1528*	296	*81*	636	*11*	560	*195*

Table 9-305. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						n.a.					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	565	*21*	692	*132*	460	*26*	872	*61*	1000	*148*	902	*177*
	4-8	482	*38*	560	*22*	412	*35*	897	*66*	990	*9*	967	*50*
	8-15	568	*49*	792	*166*	578	*269*	850	*143*	1100	*123*	1048	*473*
Seawater	0-4	565	*21*	515	*119*	417	*27*	872	*61*	827	*189*	804	*82*
	4-8	482	*38*	493	*80*	356	*15*	897	*66*	918	*173*	734	*45*
	8-15	568	*49*	550	*149*	455	*22*	850	*143*	873	*148*	775	*116*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-306. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Mn and As. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						20					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	13.4	*0.1*	20.4	*0.4*	17.8	*4.2*	0.67	*0.05*	0.33	*0.38*	0.25	*0.09*
	4-8	8.4	*0.8*	12.5	*2.4*	12.3	*0.1*	0.65	*0.02*	0.51	*0.19*	0.52	*0.04*
	8-15	8.2	*2.0*	13.1	*0.8*	15.1	*13.5*	0.64	*0.02*	0.75	*0.06*	0.37	*0.14*
Seawater	0-4	13.4	*0.1*	16.7	*5.0*	13.9	*0.2*	0.67	*0.05*	0.57	*0.18*	0.30	*0.25*
	4-8	8.4	*0.8*	10.8	*1.9*	6.6	*<0.1*	0.65	*0.02*	0.74	*0.05*	0.20	*0.32*
	8-15	8.2	*2.0*	8.2	*2.9*	8.2	*5.5*	0.64	*0.02*	0.65	*0.15*	0.28	*0.40*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-307. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Cu and Ni. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		65						21					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.05	*0.14*	0.87	*0.06*	0.67	*0.24*	0.84	*0.33*	0.78	*0.22*	1.72	*2.11*
	4-8	0.61	*0.11*	0.68	*0.07*	0.58	*0.08*	0.84	*0.81*	0.53	*0.03*	1.71	*2.30*
	8-15	1.03	*0.61*	0.89	*0.01*	0.85	*0.46*	0.57	*0.12*	0.86	*0.07*	1.35	*0.46*
Seawater	0-4	1.05	*0.14*	0.68	*0.10*	0.69	*0.01*	0.84	*0.33*	0.63	*0.06*	1.06	-
	4-8	0.61	*0.11*	0.69	*0.05*	0.58	*0.30*	0.84	*0.81*	0.54	*0.12*	0.41	-
	8-15	1.03	*0.61*	0.63	*0.05*	0.78	*0.53*	0.57	*0.12*	0.55	*0.15*	1.61	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-308. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Zn and Cd. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		200						1.5					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	3.16	*0.02*	1.88	*0.22*	1.83	*0.47*	0.01	*<0.01*	0.02	*<0.01*	<0.01	-
	4-8	2.67	*0.29*	1.44	*0.27*	1.43	*0.46*	0.01	*<0.01*	0.02	*<0.01*	0.01	*<0.01*
	8-15	3.00	*0.27*	1.87	*0.12*	1.59	*0.77*	0.01	*0.01*	0.02	*0.01*	<0.01	-
Seawater	0-4	3.16	*0.02*	1.37	*0.41*	3.41	*0.86*	0.01	*<0.01*	0.02	*<0.01*	0.01	*0.01*
	4-8	2.67	*0.29*	1.23	*0.07*	3.90	*1.55*	0.01	*<0.01*	0.03	*<0.01*	0.01	*<0.01*
	8-15	3.00	*0.27*	1.15	*0.22*	2.17	*0.30*	0.01	*0.01*	0.02	*<0.01*	0.01	*<0.01*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-309. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Co and Cr. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
ISQG-Low*		n.a.						80					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.44	*0.02*	0.59	*0.10*	0.52	*0.11*	1.45	*0.05*	1.97	*0.06*	1.77	*0.54*
	4-8	0.31	*0.04*	0.40	*0.03*	0.35	*0.03*	1.76	*0.64*	1.72	*0.16*	1.85	*0.45*
	8-15	0.35	*0.02*	0.49	*0.01*	0.45	*0.18*	1.35	*0.06*	2.04	*0.35*	2.27	*0.45*
Seawater	0-4	0.44	*0.02*	0.47	*0.06*	0.44	*0.01*	1.45	*0.05*	1.28	*0.17*	2.23	*0.18*
	4-8	0.31	*0.04*	0.40	*0.07*	0.32	*0.08*	1.76	*0.64*	1.26	*0.21*	1.62	-
	8-15	0.35	*0.02*	0.37	*0.02*	0.44	*0.14*	1.35	*0.06*	1.16	*0.23*	2.41	-

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-310. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): Total Pb. (The values in bold red text exceed the ISQG-Low (trigger value)).

		Pb (ppm)					
		Day 0		Day 35		Day 136	
ISQG-Low*		50					
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.33	*0.20*	1.41	*0.02*	1.28	*0.32*
	4-8	0.99	*0.02*	1.25	*0.07*	1.14	*0.03*
	8-15	1.00	*0.33*	1.15	*0.21*	1.10	*0.47*
Seawater	0-4	1.33	*0.20*	1.26	*0.19*	1.20	*0.13*
	4-8	0.99	*0.02*	1.43	*0.62*	0.88	*0.05*
	8-15	1.00	*0.33*	0.99	*0.09*	0.83	*0.11*

* Australian sediment quality guidelines for total metals from ANZECC/ARMCANZ (2000).

Table 9-311. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Al and Fe.

		Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	82	*3*	132	*15*	27	*1*	163	*29*	328	*9*	175	*14*
	4-8	71	*7*	122	*37*	23	*3*	236	*25*	432	*156*	240	*22*
	8-15	86	*3*	146	*36*	39	*31*	207	*23*	355	*44*	222	*94*
Seawater	0-4	82	*3*	100	*10*	46	*4*	163	*29*	272	*1*	237	*77*
	4-8	71	*7*	111	*2*	35	*5*	236	*25*	381	*19*	261	*68*
	8-15	86	*3*	108	*37*	40	*6*	207	*23*	284	*64*	204	*16*

Table 9-312. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Mn and As.

		Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	Depth (cm)	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	4.5	*1.0*	8.7	*2.1*	5.6	*0.7*	0.20	*0.03*	0.36	*0.07*	0.16	*0.02*
	4-8	2.0	*0.1*	4.3	*0.4*	2.4	*1.2*	0.22	*0.01*	0.40	*0.05*	0.20	*<0.01*
	8-15	3.0	*0.2*	5.7	*0.1*	7.8	*11.6*	0.30	*0.02*	0.52	*0.01*	0.34	*0.21*
Seawater	0-4	4.5	*1.0*	7.8	*2.2*	5.2	*1.6*	0.20	*0.03*	0.25	*0.04*	0.30	*0.08*
	4-8	2.0	*0.1*	3.1	*0.4*	1.3	*0.7*	0.22	*0.01*	0.28	*0.03*	0.35	*0.04*
	8-15	3.0	*0.2*	3.1	*1.7*	2.2	*1.1*	0.30	*0.02*	0.31	*0.09*	0.38	*0.05*

Table 9-313. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Cu and Ni.

		Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.54	*0.16*	0.51	*<0.01*	0.23	*0.02*	0.24	*0.01*	0.52	*0.09*	0.21	*0.02*
	4-8	0.32	*<0.01*	0.42	*0.06*	0.19	*0.04*	0.11	*0.02*	0.29	*0.19*	0.08	*0.03*
	8-15	0.56	*0.20*	0.52	*0.01*	0.34	*0.22*	0.18	*0.01*	0.41	*0.07*	0.23	*0.19*
Seawater	**0-4**	0.54	*0.16*	0.40	*0.05*	0.36	*0.04*	0.24	*0.01*	0.29	*0.06*	0.27	*0.02*
	4-8	0.32	*<0.01*	0.39	*0.01*	0.30	*0.07*	0.11	*0.02*	0.19	*0.07*	0.15	*0.06*
	8-15	0.56	*0.20*	0.39	*0.09*	0.38	*0.06*	0.18	*0.01*	0.24	*0.14*	0.22	*0.03*

Table 9-314. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Zn and Cd.

		Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.74	*0.06*	0.91	*0.05*	0.46	*0.07*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	0.43	*0.03*	0.74	*0.53*	0.23	*0.12*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.59	*0.07*	0.70	*0.04*	0.48	*0.38*	<0.01	-	<0.01	-	<0.01	-
Seawater	**0-4**	0.74	*0.06*	0.75	*0.06*	0.70	*0.18*	<0.01	-	0.01	*<0.01*	<0.01	-
	4-8	0.43	*0.03*	0.50	*0.05*	0.44	*0.25*	<0.01	-	<0.01	-	<0.01	-
	8-15	0.59	*0.07*	0.54	*0.20*	0.45	*0.03*	<0.01	-	<0.01	-	<0.01	-

Table 9-315. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Co and Cr.

		Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.19	*0.01*	0.34	*0.02*	0.19	*<0.01*	0.05	*0.01*	0.24	*0.21*	0.09	*0.01*
	4-8	0.09	*0.01*	0.20	*0.06*	0.08	*0.06*	0.03	*0.01*	0.23	*0.45*	0.08	*<0.01*
	8-15	0.14	*0.01*	0.22	*0.01*	0.15	*0.10*	0.05	*<0.01*	0.18	*0.15*	0.10	*0.01*
Seawater	**0-4**	0.19	*0.01*	0.25	*0.02*	0.20	*0.03*	0.05	*0.01*	0.09	*0.16*	0.14	*0.01*
	4-8	0.09	*0.01*	0.19	*0.02*	0.12	*0.03*	0.03	*0.01*	0.12	*0.08*	0.12	*0.01*
	8-15	0.14	*0.01*	0.18	*0.03*	0.16	*<0.01*	0.05	*<0.01*	0.19	*<0.01*	0.12	*0.01*

Table 9-316. Selected sediment properties before and after inundation of the Poltalloch Station soil material (Site 15): 1M HCl extractable Pb.

		Pb (ppm)					
		Day 0		Day 35		Day 136	
Treatment	**Depth (cm)**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
River Murray	**0-4**	0.56	*0.07*	0.94	*0.02*	0.58	*0.01*
	4-8	0.45	*0.08*	0.78	*0.11*	0.47	*0.12*
	8-15	0.38	*0.01*	0.65	*0.08*	0.62	*0.37*
Seawater	**0-4**	0.56	*0.07*	0.68	*0.10*	0.69	*0.07*
	4-8	0.45	*0.08*	0.75	*0.29*	0.60	*0.14*
	8-15	0.38	*0.01*	0.51	*0.05*	0.41	*0.13*

Appendix 4. Surface water and pore-water characteristics

Table 9-317. Selected surface water properties after inundation of the Waltowa soil material (Site 1): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.76	0.48	7.23	0.78	416	9	313	181	2.3	<0.1	3.7	0.1
4	6.67	0.62	7.06	0.14	315	144	267	113	2.2	0.2	4.0	0.3
7	6.60	0.68	7.13	0.51	250	45	347	251	3.0	0.6	7.1	1.4
11	6.66	0.73	6.86	0.64	284	223	294	230	3.7	0.9	4.7	0.1
18	6.64	0.67	7.44	0.05	314	276	263	22	2.2	0.4	4.0	<0.1
25	7.09	0.30	7.56	0.19	279	240	219	28	3.3	0.5	4.3	0.1
35	6.98	0.79	7.82	0.03	278	240	236	14	3.8	0.9	4.3	0.2
136	8.01	0.07	7.79	0.25	312	237	305	258	5.9	1.4	4.6	1.1

Table 9-318. Selected pore-water properties (3-5 cm) after inundation of the Waltowa soil material (Site 1): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.88	0.86	7.35	0.59	447	5	313	190	4.4	3.1	6.5	2.0
4	6.76	0.19	6.83	0.32	151	69	141	9	6.7	2.6	6.7	2.2
7	6.64	0.40	6.57	0.76	139	4	149	5	7.3	5.5	10.0	1.2
11	6.77	0.44	6.61	0.12	138	47	130	48	7.9	7.2	6.9	3.4
18	6.73	0.38	6.75	0.43	129	87	117	9	5.5	5.3	5.3	0.9
25	7.05	0.42	6.91	0.05	240	138	107	7	8.1	8.3	7.2	0.7
35	6.91	0.71	7.01	0.15	143	103	109	2	7.2	6.3	6.1	1.1
136	7.15	0.25	6.90	0.04	159	3	119	4	10.1	6.3	6.4	-

Table 9-319. Selected pore-water properties (10-12 cm) after inundation of the Waltowa soil material (Site 1): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	5.65	1.28	6.94	0.01	383	66	188	75	2.2	2.3	8.8	2.2
4	6.09	0.46	6.45	0.23	239	77	142	44	3.0	2.8	7.7	1.6
7	6.15	0.26	6.58	0.08	212	65	152	13	3.6	4.6	10.8	0.2
11	6.29	0.14	6.67	0.14	135	22	123	3	7.2	2.7	7.9	1.7
18	6.34	0.05	6.58	0.12	122	4	116	10	4.3	1.9	5.5	1.2
25	6.53	0.02	6.82	0.01	115	0	96	3	11.0	0.7	8.4	1.8
35	6.52	0.04	6.89	0.17	107	24	95	5	13.2	1.4	7.6	0.6
136	6.82	0.16	6.76	0.06	123	15	111	12	15.1	4.0	6.6	0.2

Table 9-320. Selected surface water properties after inundation of the Waltowa soil material (Site 1): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.81	*0.28*	0.55	*<0.2*	<0.2	-	<0.2	-	8.6	-	3.9	-
4	0.20	*<0.2*	<0.2	-	<0.2	-	0.48	*<0.2*				
7	<0.2	-	<0.2	-	<0.2	-	0.70	*1.20*				
11	0.78	*1.55*	<0.2	-	<0.2	-	<0.2	-	7.2	-	7.0	-
18	0.57	*<0.2*	0.57	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.9	-	7.8	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	10.3	*3.5*	7.9	*1.5*

Table 9-321. Selected pore-water properties (3-5 cm) after inundation of the Waltowa soil material (Site 1): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.73	*0.45*	0.88	*<0.2*	<0.2	-	<0.2	-	45.0	-	61.0	-
4	2.40	*2.80*	17.75	*27.70*	0.28	*0.55*	0.65	*1.30*				
7	6.60	*7.00*	35.45	*38.30*	1.60	*0.60*	<0.2	-				
11	6.85	*9.30*	24.65	*39.30*	3.90	*7.79*	8.40	*14.93*	59.0	-	31.0	-
18	12.42	*22.02*	39.30	*5.69*	0.96	*1.92*	0.71	*0.36*				
25	12.31	*24.00*	50.61	*21.31*	3.61	*7.13*	2.75	*5.49*				
35	7.79	*14.71*	33.36	*25.85*	9.53	*19.05*	1.25	*0.54*	29.0	-	15.0	-
136	9.88	*12.31*	20.94	*4.92*	0.44	*0.88*	0.53	*<0.2*	24.0	*24.0*	14.0	*4.0*

Table 9-322. Selected pore-water properties (10-12 cm) after inundation of the Waltowa soil material (Site 1): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.23	*11.95*	18.23	*22.25*	<0.2	-	<0.2	-	62.0	-	29.0	-
4	27.53	*22.35*	48.30	*23.40*	0.35	*0.70*	2.65	*0.90*				
7	55.20	*19.60*	44.63	*33.75*	8.15	*11.30*	<0.2	-				
11	132.50	*59.00*	48.50	*3.40*	<0.2	-	15.74	*2.62*	95.0	-	43.0	-
18	164.37	*82.25*	69.25	*7.71*	4.87	*7.68*	0.36	*0.73*				
25	158.77	*104.42*	65.08	*4.01*	11.15	*2.67*	8.11	*7.61*				
35	166.46	*83.80*	68.68	*3.17*	13.89	*1.31*	6.26	*5.56*	100.0	-	28.0	-
136	75.54	*22.83*	51.63	*16.30*	13.75	*6.67*	<0.2	-	98.0	*24.0*	16.0	*6.0*

Table 9-323. Selected nutrients in the surface water after inundation of the Waltowa soil material (Site 1): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.065	*0.030*	0.010	*<0.005*	0.035	*0.010*	0.040	*<0.005*
4	0.060	*0.040*	0.050	*0.080*	0.030	*<0.005*	0.050	*0.020*
7	0.155	*0.050*	0.140	*0.200*	0.040	*0.060*	0.115	*0.010*
11	0.260	*0.180*	0.405	*0.170*	0.185	*0.310*	0.205	*0.230*
18	1.105	*0.090*	0.730	*0.280*	0.475	*0.910*	0.635	*0.730*
25	1.285	*0.290*	1.580	*1.000*	<0.005	-	0.120	*0.200*
35	0.970	*0.260*	1.315	*0.010*	<0.005	-	<0.005	-
136	0.640	*0.080*	1.745	*0.130*	<0.005	-	0.005	*0.010*

Table 9-324. Selected nutrients in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	1.340	*2.440*	0.475	*0.330*	0.705	*1.030*	0.480	*0.140*
4	0.030	*<0.005*	0.030	*0.020*	0.010	*<0.005*	0.025	*0.030*
7	0.150	*0.100*	0.110	*0.060*	0.020	*0.020*	0.085	*0.030*
11	0.265	*0.290*	0.195	*0.170*	0.020	*0.020*	0.110	*0.200*
18	0.425	*0.630*	0.235	*0.250*	0.370	*0.600*	0.260	*0.260*
25	0.800	*0.920*	0.420	*0.380*	0.045	*0.050*	0.140	*0.060*
35	0.615	*0.730*	0.495	*0.090*	0.065	*0.090*	0.045	*0.050*
136	0.235	*0.430*	0.640	*0.100*	0.070	*0.060*	0.040	*0.020*

Table 9-325. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	1.065	*0.470*	0.025	*0.030*	0.190	*0.080*	0.065	*0.050*
4	0.080	*0.160*	1.625	*3.250*	0.050	*0.040*	0.110	*0.060*
7	0.085	*0.070*	0.085	*0.010*	0.085	*0.090*	0.130	*0.040*
11	0.240	*0.060*	0.200	*0.040*	0.175	*0.010*	0.165	*0.010*
18	0.105	*0.110*	0.120	*0.100*	0.550	*0.120*	0.230	*0.140*
25	0.490	*0.160*	0.185	*0.030*	0.535	*0.190*	0.200	*0.120*
35	0.455	*0.130*	0.265	*0.030*	0.360	*0.140*	0.070	*0.080*
136	<0.005	-	0.140	*0.060*	0.345	*0.090*	0.045	*0.010*

* The WQGs are the ANZECC trigger values for freshwater and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-326. Selected nutrients in the surface water after inundation of the Waltowa soil material (Site 1): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.008	*0.005*	0.015	*0.010*	0.185	*0.050*	0.180	*0.020*
4	0.090	*0.020*	0.080	*0.020*	0.485	*0.210*	0.570	*0.400*
7	0.100	*0.020*	0.055	*0.010*	1.550	*0.080*	1.055	*0.290*
11	0.145	*0.010*	0.075	*0.010*	1.210	*0.640*	1.310	*0.300*
18	0.135	*0.010*	0.070	*<0.005*	0.145	*0.090*	**6.305**	*11.610*
25	0.130	*<0.005*	0.075	*0.030*	0.080	*<0.005*	**3.250**	*5.560*
35	0.130	*<0.005*	0.050	*<0.005*	0.070	*<0.005*	0.095	*0.010*
136	0.125	*0.010*	0.120	*0.040*	0.330	*0.040*	0.060	*0.020*

Table 9-327. Selected nutrients in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.135	*0.110*	0.065	*0.070*	2.060	*1.300*	**4.505**	*5.610*
4	0.410	*0.340*	0.110	*<0.005*	**2.715**	*0.230*	**2.285**	*1.130*
7	0.795	*1.350*	0.100	*0.060*	**3.450**	*0.960*	**3.310**	*1.280*
11	1.455	*2.450*	0.210	*0.380*	**3.080**	*1.880*	**3.215**	*4.130*
18	1.920	*2.480*	0.380	*0.500*	**3.030**	*3.480*	**3.860**	*0.720*
25	1.050	*1.440*	0.230	*0.160*	**2.845**	*4.650*	**3.815**	*0.670*
35	0.455	*0.350*	0.145	*0.190*	**2.860**	*4.980*	**2.905**	*1.310*
136	0.060	*0.080*	0.085	*0.030*	**5.530**	*5.500*	**2.905**	*0.810*

Table 9-328. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.020	*<0.005*	0.050	*0.040*	0.840	*0.460*	0.950	*0.700*
4	0.065	*0.050*	0.165	*0.050*	1.705	*0.170*	**1.850**	*0.440*
7	0.080	*0.040*	0.145	*0.070*	**3.415**	*0.190*	**2.560**	*0.520*
11	0.265	*0.030*	0.350	*0.020*	**4.910**	*1.260*	**3.915**	*0.990*
18	0.390	*0.120*	0.285	*0.150*	**6.710**	*2.300*	**4.590**	*1.840*
25	0.510	*0.200*	0.300	*0.140*	**7.255**	*2.110*	**5.570**	*1.320*
35	0.340	*0.160*	0.070	*0.040*	**8.095**	*0.650*	**4.770**	*0.620*
136	0.315	*0.090*	0.060	*0.020*	**12.215**	*0.450*	**4.375**	*0.950*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-329. Selected metals in the surface water after inundation of the Waltowa soil material (Site 1): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.05	*0.08*	0.05	*0.09*	0.06	*0.12*	0.07	*0.07*	<0.01	-	0.02	*0.02*
4	0.03	*0.02*	0.01	*<0.01*	0.05	*0.05*	0.22	*0.22*	0.14	*0.11*	0.76	*0.60*
7	0.02	*0.02*	0.02	*0.02*	0.21	*0.14*	0.11	*0.08*	0.28	*0.26*	0.89	*0.28*
11	0.04	*0.04*	<0.01	-	0.09	*0.09*	0.10	*0.09*	0.18	*0.21*	0.56	*0.51*
18	<0.01	-	0.05	*0.09*	0.12	*0.23*	0.14	*0.15*	<0.01	-	0.25	*0.35*
25	0.03	*0.02*	0.01	*0.01*	0.09	*0.04*	0.16	*0.11*	<0.01	-	0.06	*0.11*
35	0.01	*<0.01*	<0.01	-	0.12	*0.21*	0.05	*0.06*	<0.01	-	<0.01	-
136	0.03	*0.01*	<0.01	-	0.07	*<0.01*	0.14	*0.01*	<0.01	-	<0.01	-

Table 9-330. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	*0.03*	0.03	*0.05*	0.04	*0.01*	0.03	*<0.01*	0.04	*<0.01*	3.15	*5.95*
4	0.02	*<0.01*	<0.01	-	3.22	*1.99*	14.39	*22.08*	**5.42**	*3.36*	10.41	*13.65*
7	0.02	*<0.01*	0.05	*<0.01*	8.35	*8.69*	32.38	*33.29*	3.41	*2.63*	10.93	*11.00*
11	0.02	*0.02*	<0.01	-	8.88	*15.99*	28.01	*50.16*	2.54	*3.46*	8.95	*16.89*
18	<0.01	-	<0.01	-	14.05	*26.57*	37.63	*13.48*	2.87	*3.97*	7.40	*7.03*
25	0.01	*<0.01*	<0.01	-	13.24	*25.96*	43.19	*5.48*	2.28	*3.59*	7.35	*3.93*
35	<0.01	-	<0.01	-	16.13	*31.55*	28.45	*21.35*	2.29	*3.56*	4.56	*1.62*
136	<0.01	-	0.01	*<0.01*	12.95	*16.62*	20.42	*2.47*	2.04	*1.22*	2.06	*0.77*

Table 9-331. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	1.09	*2.17*	<0.01	-	5.59	*10.91*	18.62	*25.44*	**9.62**	*16.01*	13.05	*2.10*
4	0.74	*1.43*	0.01	*<0.01*	30.21	*27.67*	45.69	*22.02*	**10.63**	*13.46*	12.85	*3.83*
7	0.19	*0.36*	0.01	*<0.01*	53.82	*28.12*	52.25	*5.17*	**11.22**	*12.73*	15.45	*5.69*
11	0.02	*0.03*	0.02	*0.01*	100.94	*31.70*	55.90	*1.11*	**12.94**	*12.83*	16.09	*11.08*
18	<0.01	-	0.07	*0.14*	177.22	*125.06*	60.54	*8.41*	**14.15**	*17.04*	12.98	*9.72*
25	<0.01	-	<0.01	-	149.10	*69.58*	67.64	*8.44*	**10.18**	*9.29*	11.46	*7.35*
35	0.01	*<0.01*	0.01	*0.01*	159.45	*67.61*	61.99	*10.84*	**10.69**	*10.55*	9.35	*6.58*
136	0.03	*0.05*	<0.01	-	82.74	*27.80*	36.82	*16.94*	**6.45**	*5.09*	3.14	*1.68*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-332. Selected metalloids and metals in the surface water after inundation of the Waltowa soil material (Site 1): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.79	*0.70*	22.81	*5.01*	2.58	*0.38*	<1.0	-	1.59	*0.24*	<5.0	-
4	2.32	*1.01*	<15.0	-	2.19	*1.34*	<1.0	-	2.03	*1.15*	<5.0	-
7	3.54	*0.61*	<15.0	-	3.90	*0.90*	2.91	*3.19*	3.61	-	<5.0	-
11	5.06	*3.02*	16.50	*5.77*	2.89	*0.54*	<1.0	-	2.79	*1.08*	5.97	*1.94*
18	4.75	*0.39*	22.67	*0.02*	3.34	*0.06*	2.21	*2.52*	2.09	*0.17*	5.16	*2.97*
25	4.13	*1.55*	40.49	*1.71*	2.70	-	3.27	*2.07*	2.57	-	5.23	*2.19*
35	4.73	*0.01*	<15.0	-	4.14	*2.52*	2.42	*1.25*	2.70	*0.39*	<5.0	-
136	5.15	*1.65*	36.87	*8.21*	3.61	*0.40*	2.95	*2.16*	4.67	*0.46*	9.84	*14.86*

Table 9-333. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	8.81	*6.94*	15.93	*3.51*	7.40	*6.24*	2.34	*4.67*	24.65	*27.75*	28.84	*23.43*
4	33.70	*16.20*	26.15	*6.88*	2.46	*1.26*	<1.0	-	30.85	*34.65*	26.70	*32.80*
7	39.72	*37.87*	46.85	*18.75*	2.77	*1.78*	3.39	*0.47*	33.92	*55.21*	27.92	*17.10*
11	39.10	*58.56*	46.29	*61.94*	2.38	*0.27*	2.04	*1.17*	24.83	*42.29*	18.26	*24.21*
18	46.35	*70.15*	62.95	*12.04*	2.19	*0.93*	3.24	*2.16*	17.48	*26.88*	12.26	*1.17*
25	33.19	*54.74*	86.38	*13.09*	1.61	*0.03*	5.18	*2.71*	11.39	*15.58*	13.11	*0.58*
35	34.56	*56.25*	33.83	*16.53*	1.99	*0.70*	1.38	*0.29*	7.15	*7.89*	5.41	*0.30*
136	40.39	*45.33*	62.11	*5.81*	1.02	*1.05*	6.97	*1.64*	7.18	*0.86*	2.48	*1.42*

Table 9-334. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	11.37	*0.66*	28.89	*29.32*	6.50	*0.30*	<1.0	-	**147.21**	*238.60*	32.05	*15.03*
4	19.10	*6.52*	60.49	*15.34*	4.24	*1.52*	2.50	*0.62*	**141.76**	*214.29*	23.11	*22.56*
7	29.63	*12.60*	68.97	*9.06*	2.39	*2.02*	4.10	*0.81*	**121.18**	*161.04*	24.06	*25.54*
11	50.15	*19.09*	76.09	*7.54*	2.65	*1.38*	3.47	*0.52*	**91.60**	*96.79*	26.16	*23.62*
18	81.05	*11.39*	88.71	*5.83*	1.60	*1.57*	3.73	*3.70*	77.39	*79.54*	20.04	*23.56*
25	89.01	*5.54*	113.56	*1.33*	<1.0	-	4.48	*2.72*	44.18	*19.64*	18.37	*19.24*
35	107.36	*9.11*	80.51	*1.34*	2.30	*0.80*	2.02	*0.62*	30.33	*10.95*	11.40	*17.16*
136	140.45	*29.73*	112.46	*15.14*	<1.0	-	**9.18**	*2.56*	12.57	*1.58*	4.77	*4.64*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-335. Selected metals in the surface water after inundation of the Waltowa soil material (Site 1): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	18.61	16.86	11.28	0.68	<0.1	-	0.45	0.62	<1.0	-	1.16	1.89
4	56.03	12.62	21.71	2.11	<0.1	-	0.17	<0.1	<1.0	-	2.49	0.70
7	36.97	1.62	38.83	10.66	0.18	0.24	0.22	<0.1	<1.0	-	4.02	0.61
11	26.12	2.55	27.36	3.96	0.11	<0.1	0.23	<0.1	<1.0	-	2.69	0.37
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	1.08	0.48
25	3.94	1.95	11.70	8.67	<0.1	-	0.11	<0.1	<1.0	-	<1.0	-
35	56.08	24.46	**86.17**	21.95	<0.1	-	0.13	<0.1	<1.0	-	<1.0	-
136	10.25	11.27	5.38	9.71	<0.1	-	<0.1	-	<1.0	-	<1.0	-

Table 9-336. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	26.66	14.45	27.21	9.90	0.13	0.19	0.26	0.18	1.47	0.38	18.45	29.41
4	48.81	-	**71.46**	31.35	<0.1	-	0.10	<0.1	30.57	31.71	83.87	122.45
7	26.52	4.87	41.43	14.81	0.13	<0.1	0.10	<0.1	35.40	60.43	76.05	69.95
11	47.17	25.27	**48.89**	-	<0.1	-	<0.1	-	24.92	45.93	43.36	72.93
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	17.97	32.45	31.91	11.88
25	17.48	5.48	24.13	10.38	<0.1	-	<0.1	-	11.80	21.51	28.59	3.36
35	77.94	-	**82.58**	10.10	<0.1	-	<0.1	-	9.78	17.49	16.55	7.99
136	33.35	50.81	24.82	19.17	<0.1	-	0.12	<0.1	3.46	1.77	6.59	0.70

Table 9-337. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	104.53	122.76	**51.56**	32.86	1.12	1.51	0.25	<0.1	118.17	214.95	48.51	24.64
4	**200.57**	219.13	**74.79**	66.53	0.73	0.77	0.21	0.16	122.73	183.92	49.64	18.33
7	86.85	69.85	**122.24**	65.52	0.54	0.54	0.18	0.16	137.41	178.93	59.02	12.49
11	78.90	29.49	**85.25**	73.37	0.23	0.11	0.27	<0.1	136.77	148.70	66.09	20.62
18	n.a.	-	n.a.	-	0.13	<0.1	0.21	0.22	127.62	154.53	64.11	39.40
25	44.25	21.80	28.91	9.00	0.13	<0.1	0.13	<0.1	74.09	66.98	53.56	28.63
35	80.00	29.46	**56.34**	40.64	0.16	0.16	0.11	0.12	54.14	46.23	37.23	19.18
136	54.49	71.26	16.32	11.76	<0.1	-	0.11	0.10	10.32	4.13	10.12	5.28

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-338. Selected metals in the surface water after inundation of the Waltowa soil material (Site 1): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<1.0	-	<4.4	-	<1.0	-	1.88	*3.62*
4	1.32	*0.44*	<4.4	-	<1.0	-	<1.0	-
7	1.65	-	<4.4	-	<1.0	-	<1.0	-
11	1.73	*0.30*	<4.4	-	<1.0	-	<1.0	-
18	1.78	*0.55*	<4.4	-	1.52	*2.88*	<1.0	-
25	2.08	*1.14*	<4.4	-	<1.0	-	<1.0	-
35	2.38	*1.21*	<4.4	-	<1.0	-	<1.0	-
136	2.76	*2.02*	<4.4	-	<1.0	-	<1.0	-

Table 9-339. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	2.29	*1.10*	<4.4	-	<1.0	-	<1.0	-
4	2.22	*1.05*	<4.4	-	<1.0	-	<1.0	-
7	2.06	*0.68*	<4.4	-	<1.0	-	<1.0	-
11	2.98	*2.12*	<4.4	-	<1.0	-	<1.0	-
18	3.02	*1.70*	<4.4	-	<1.0	-	<1.0	-
25	2.16	*0.50*	<4.4	-	<1.0	-	<1.0	-
35	2.64	*1.13*	<4.4	-	<1.0	-	<1.0	-
136	3.20	*1.16*	4.80	*0.28*	<1.0	-	<1.0	-

Table 9-340. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	1.96	*1.41*	<4.4	-	1.49	*1.04*	<1.0	-
4	1.62	*2.92*	<4.4	-	1.68	*1.01*	<1.0	-
7	1.60	*0.98*	<4.4	-	1.06	*<1.0*	<1.0	-
11	2.67	*0.49*	<4.4	-	<1.0	-	<1.0	-
18	2.12	*0.15*	<4.4	-	<1.0	-	1.05	*1.20*
25	2.39	*0.79*	<4.4	-	<1.0	-	<1.0	-
35	3.49	*1.56*	<4.4	-	<1.0	-	<1.0	-
136	2.94	*0.08*	6.01	*2.50*	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-341. Major cations in the surface water after inundation of the Waltowa soil material (Site 1): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	115	*1*	9726	*362*	4.7	*0.1*	328.0	*7.8*	19.8	*0.7*	394.7	*27.6*
4	136	*1*	9792	*349*	7.2	*0.7*	350.6	*6.5*	26.2	*0.7*	460.9	*8.3*
7	141	*19*	9561	*112*	8.5	*0.5*	329.9	*13.0*	28.5	*0.7*	477.1	*25.5*
11	147	*10*	10600	*861*	8.9	*<0.1*	345.1	*2.5*	31.9	*2.5*	488.6	*22.2*
18	169	*26*	9335	*2116*	9.5	*0.4*	356.5	*53.6*	32.9	*0.9*	474.9	*64.9*
25	198	*47*	9928	*157*	10.5	*1.7*	381.8	*1.1*	37.4	*2.1*	470.9	*23.5*
35	218	*46*	9880	*760*	10.8	*1.6*	378.6	*1.5*	44.3	*1.7*	451.3	*23.6*
136	471	*11*	14035	*1383*	20.2	*0.2*	502.8	*1.6*	70.2	*2.8*	560.1	*7.7*

Table 9-342. Major cations in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1946	*2565*	5420	*2987*	66.6	*76.7*	187.4	*95.2*	251.7	*304.7*	478.2	*113.0*
4	1088	*1137*	8165	*1459*	39.7	*38.6*	277.6	*58.3*	138.3	*84.7*	486.4	*61.4*
7	837	*1064*	8390	*942*	31.8	*34.9*	257.5	*18.5*	115.4	*108.4*	499.0	*41.5*
11	669	*930*	7265	*3906*	25.7	*28.4*	229.3	*88.0*	84.4	*90.1*	395.7	*292.3*
18	824	*1089*	8235	*351*	27.1	*28.4*	291.3	*19.6*	104.1	*101.6*	440.3	*29.0*
25	680	*870*	9933	*635*	23.4	*23.2*	358.9	*14.5*	80.1	*76.8*	537.7	*<0.1*
35	525	*518*	9471	*487*	21.3	*17.3*	341.3	*28.9*	69.0	*37.7*	465.7	*14.1*
136	809	*278*	13566	*1059*	25.6	*3.7*	475.6	*15.9*	97.2	*15.8*	546.8	*28.6*

Table 9-343. Major cations in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3322	*767*	3492	*479*	96.9	*19.3*	100.4	*17.4*	484.7	*13.5*	462.1	*12.5*
4	3323	*732*	6701	*1955*	106.4	*12.3*	191.1	*67.2*	510.3	*20.6*	540.2	*19.1*
7	3258	*813*	6584	*682*	95.1	*11.9*	196.0	*24.8*	499.8	*7.0*	520.4	*18.2*
11	3161	*1163*	7638	*1253*	86.5	*19.2*	222.5	*57.3*	444.0	*51.0*	491.8	*18.9*
18	3032	*224*	7240	*536*	78.2	*5.2*	238.5	*31.1*	439.0	*94.6*	460.0	*20.1*
25	2543	*586*	8421	*578*	65.4	*10.3*	277.8	*24.5*	333.3	*6.4*	493.3	*6.2*
35	2146	*359*	8569	*44*	57.5	*9.1*	283.4	*1.2*	295.2	*17.6*	451.5	*35.0*
136	1585	*236*	13135	*440*	37.6	*2.9*	436.6	*34.0*	199.1	*4.4*	538.0	*39.3*

Table 9-344. Major cations and anions in the surface water after inundation of the Waltowa soil material (Site 1): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	15.0	*1.1*	1177.5	*34.7*	137	*9*	19765	*148*	95	*30*	2953	*201*
4	18.2	*1.0*	1261.4	*29.5*	205	*12*	19675	*967*	70	*17*	3304	*19*
7	17.3	*2.0*	1287.1	*26.3*	241	*44*	20493	*771*	89	*11*	2817	*15*
11	17.1	*<0.1*	1479.5	*50.2*	261	*27*	20118	*945*	64	*<1*	2951	*188*
18	22.9	*1.8*	1227.0	*384.6*	279	*30*	18423	*2917*	71	*14*	2841	*410*
25	26.3	*4.3*	1202.0	*44.9*	262	*51*	19873	*1289*	78	*15*	2991	*135*
35	30.0	*4.6*	1243.3	*46.1*	317	*69*	21439	*1051*	68	*31*	3094	*65*
136	57.8	*0.6*	1622.3	*62.8*	606	*15*	25686	*1260*	139	*28*	3866	*69*

Table 9-345. Major cations and anions in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	337.4	*463.6*	840.5	*203.5*	3255	*4584*	10715	*7534*	1661	*2206*	3446	*985*
4	156.2	*127.9*	1137.0	*113.8*	1614	*1678*	16276	*3273*	716	*775*	3205	*251*
7	120.9	*147.4*	1144.1	*78.5*	1364	*1756*	17401	*2101*	650	*878*	2777	*95*
11	80.5	*112.0*	993.2	*627.0*	1135	*1571*	13413	*6781*	398	*623*	2232	*1343*
18	134.7	*176.1*	1077.8	*87.7*	1131	*1415*	16927	*720*	354	*431*	2649	*93*
25	107.1	*142.2*	1279.4	*52.6*	970	*1266*	19655	*1126*	296	*409*	3093	*84*
35	81.8	*81.5*	1201.4	*31.5*	833	*866*	20626	*500*	183	*151*	3035	*11*
136	124.1	*44.5*	1574.4	*77.6*	993	*332*	24805	*1165*	331	*25*	3659	*147*

Table 9-346. Major cations and anions in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	637.0	*136.6*	675.4	*49.5*	5644	*1567*	5919	*247*	3245	*540*	3273	*138*
4	657.6	*142.6*	1015.9	*140.6*	5998	*1411*	12362	*4679*	3016	*615*	3428	*564*
7	592.2	*128.9*	994.6	*19.5*	5505	*1096*	13844	*2014*	3393	*644*	2976	*336*
11	531.7	*186.8*	1108.7	*107.5*	5330	*1605*	14359	*3546*	3046	*813*	2749	*6*
18	606.5	*15.4*	1009.2	*108.3*	4748	*669*	14903	*1921*	3026	*83*	2691	*149*
25	509.2	*103.7*	1071.2	*45.1*	3657	*499*	17442	*1039*	2377	*297*	2820	*122*
35	433.0	*59.7*	1147.0	*14.6*	3771	*598*	18623	*406*	2123	*96*	2897	*325*
136	314.1	*55.8*	1528.0	*82.7*	1989	*219*	23777	*1652*	1222	*138*	3581	*129*

Table 9-347. Selected surface water properties after inundation of the Waltowa soil material (Site 2): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.44	*0.10*	7.40	*1.17*	403	*7*	324	*16*	2.1	*0.1*	3.7	*0.1*
4	7.18	*0.74*	7.50	*0.28*	256	*32*	280	*41*	2.2	*0.2*	3.9	*0.5*
7	7.13	*0.61*	7.79	*0.12*	233	*20*	267	*59*	2.7	*<0.1*	8.7	*2.7*
11	6.84	*0.28*	7.37	*0.07*	248	*138*	198	*40*	3.2	*0.1*	7.7	*5.8*
18	7.24	*0.50*	7.82	*0.06*	151	*68*	229	*46*	1.8	*0.2*	4.3	*0.4*
25	7.57	*0.31*	7.93	*0.14*	166	*35*	215	*67*	2.5	*1.6*	5.1	*1.1*
35	7.64	*0.27*	7.66	*0.79*	157	*8*	221	*43*	3.1	*0.7*	4.9	*0.8*
136	8.16	*0.15*	7.99	*0.06*	186	*1*	180	*58*	4.6	*0.9*	5.4	*0.1*

Table 9-348. Selected pore-water properties (3-5 cm) after inundation of the Waltowa soil material (Site 2): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.83	*0.35*	7.96	*0.25*	401	*1*	341	*11*	5.8	*2.4*	6.1	*3.1*
4	7.27	*0.52*	7.28	*0.12*	285	*16*	305	*35*	6.4	*0.8*	4.8	*0.2*
7	7.21	*0.62*	7.46	*0.05*	241	*62*	311	*12*	6.6	*0.7*	8.2	*1.1*
11	7.37	*0.49*	7.33	*0.01*	312	*14*	238	*31*	6.1	*2.2*	5.7	*0.5*
18	7.24	*0.41*	7.29	*0.14*	189	*61*	233	*8*	3.2	*2.2*	4.9	*0.2*
25	7.41	*0.36*	7.28	*0.07*	164	*34*	161	*20*	5.3	*2.9*	5.0	*0.3*
35	7.44	*0.30*	7.29	*0.05*	156	*81*	136	*13*	5.3	*2.3*	4.9	*0.3*
136	7.41	*0.10*	7.23	*0.05*	161	*32*	114	*25*	6.5	*1.6*	5.2	*0.8*

Table 9-349. Selected pore-water properties (10-12 cm) after inundation of the Waltowa soil material (Site 2): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.17	*0.18*	7.79	*0.15*	420	*3*	337	*12*	7.3	*7.3*	11.4	*2.0*
4	7.13	*0.30*	7.02	*0.26*	296	*28*	315	*34*	12.0	*2.2*	6.6	*1.1*
7	7.04	*0.37*	7.15	*0.11*	274	*13*	294	*14*	11.4	*1.6*	8.4	*1.6*
11	7.17	*0.16*	7.14	*0.09*	319	*8*	296	*91*	11.2	*0.9*	6.6	*2.1*
18	7.21	*0.51*	7.11	*0.01*	210	*55*	264	*0*	4.8	*3.7*	5.2	*0.3*
25	7.20	*0.34*	7.15	*0.07*	186	*63*	240	*12*	7.5	*6.2*	5.6	*<0.1*
35	7.13	*0.25*	7.22	*0.13*	158	*44*	217	*19*	8.0	*5.1*	5.3	*0.1*
136	7.36	*0.10*	7.00	*0.08*	165	*17*	147	*29*	8.9	*2.6*	5.9	*0.5*

Table 9-350. Selected surface water properties after inundation of the Waltowa soil material (Site 2): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.38	*0.25*	0.68	*<0.2*	<0.2	-	<0.2	-	5.9	-	3.4	-
4	0.28	*<0.2*	0.63	*<0.2*	<0.2	-	<0.2	-				
7	0.25	*0.30*	0.98	*0.45*	<0.2	-	0.28	*0.55*				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.9	-	6.6	-
18	0.55	*<0.2*	0.56	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	8.1	-	6.4	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	9.0	*0.1*	5.4	*0.4*

Table 9-351. Selected pore-water properties (3-5 cm) after inundation of the Waltowa soil material (Site 2): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.35	*0.50*	0.45	*0.70*	<0.2	-	<0.2	-	35.0	-	15.0	-
4	0.28	*<0.2*	0.43	*0.25*	<0.2	-	<0.2	-				
7	<0.2	-	0.80	*1.60*	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	15.0	-	8.8	-
18	0.66	*<0.2*	0.76	*<0.2*	<0.2	-	<0.2	-				
25	0.22	*0.25*	0.93	*0.59*	<0.2	-	<0.2	-				
35	0.64	*0.82*	2.71	*0.33*	0.25	*0.43*	0.30	*0.60*	17.0	-	9.0	-
136	1.68	*1.75*	9.19	*8.03*	0.51	*0.47*	1.25	*0.97*	14.5	*5.0*	7.5	*2.6*

Table 9-352. Selected pore-water properties (10-12 cm) after inundation of the Waltowa soil material (Site 2): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.25	*0.30*	0.50	*0.60*	0.20	*0.40*	<0.2	-	28.0	-	30.0	-
4	0.30	*<0.2*	0.28	*<0.2*	<0.2	-	<0.2	-				
7	0.20	*0.40*	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	24.0	-	12.0	-
18	0.84	*0.55*	0.56	*<0.2*	<0.2	-	<0.2	-				
25	0.48	*0.88*	<0.2	-	<0.2	-	<0.2	-				
35	1.08	*1.50*	0.33	*<0.2*	<0.2	-	<0.2	-	25.0	-	12.0	-
136	0.96	*0.73*	7.15	*5.68*	<0.2	-	<0.2	-	20.0	*14.0*	8.9	*4.2*

Table 9-353. Selected nutrients in the surface water after inundation of the Waltowa soil material (Site 2): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.119	*<0.005*	0.100	*0.100*	0.036	*0.008*	0.060	*0.020*
4	0.165	*0.090*	0.545	*0.210*	0.110	*0.100*	0.040	*<0.005*
7	0.265	*0.010*	0.575	*0.070*	0.140	*<0.005*	0.045	*0.010*
11	0.380	*0.060*	0.915	*0.350*	0.010	*0.020*	0.035	*0.010*
18	0.465	*0.010*	1.070	*0.280*	0.010	*<0.005*	0.060	*0.040*
25	0.605	*0.090*	1.205	*0.170*	<0.005	-	<0.005	-
35	0.570	*0.020*	1.315	*0.190*	0.010	*0.020*	0.005	*0.010*
136	0.590	*0.040*	2.120	*0.420*	0.010	*<0.005*	<0.005	-

Table 9-354. Selected nutrients in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	14.090	*3.520*	7.625	*0.030*	0.400	*0.520*	0.060	*0.020*
4	5.290	*3.220*	0.870	*0.320*	0.050	*0.040*	0.020	*<0.005*
7	1.725	*1.590*	0.480	*0.460*	0.075	*0.050*	0.020	*0.020*
11	0.270	*0.060*	0.185	*0.150*	0.015	*0.030*	<0.005	-
18	0.155	*0.250*	0.225	*0.130*	0.020	*0.020*	0.020	*<0.005*
25	0.180	*0.080*	0.210	*0.260*	<0.005	-	0.010	*<0.005*
35	0.145	*0.130*	0.405	*0.550*	0.005	*0.010*	0.025	*0.030*
136	0.040	*0.040*	0.165	*0.070*	0.015	*0.010*	0.035	*0.010*

Table 9-355. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.238	*0.224*	0.195	*0.090*	0.042	*0.016*	0.060	*0.020*
4	0.655	*0.150*	0.625	*0.290*	0.060	*0.020*	0.055	*0.050*
7	0.620	*0.700*	0.300	*0.500*	0.135	*0.090*	0.020	*0.020*
11	0.555	*1.010*	0.050	*0.040*	0.010	*0.020*	<0.005	-
18	0.045	*0.070*	0.165	*0.150*	0.010	*<0.005*	0.010	*<0.005*
25	0.145	*0.010*	0.090	*0.140*	0.005	*0.010*	0.015	*0.030*
35	0.130	*0.060*	0.340	*0.540*	0.005	*0.010*	<0.005	-
136	0.035	*0.010*	0.060	*0.060*	0.010	*<0.005*	0.010	*0.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-356. Selected nutrients in the surface water after inundation of the Waltowa soil material (Site 2): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.015	*0.010*	0.015	*0.010*	0.210	*0.040*	0.225	*0.050*
4	0.065	*0.010*	0.080	*0.020*	0.170	*<0.005*	0.150	*0.140*
7	0.025	*0.010*	0.040	*0.020*	0.480	*<0.005*	0.300	*0.120*
11	0.025	*0.030*	0.060	*0.020*	0.090	*0.020*	0.470	*0.200*
18	0.050	*0.020*	0.050	*0.020*	0.425	*0.270*	0.220	*<0.005*
25	0.060	*<0.005*	0.075	*0.030*	0.090	*0.020*	0.420	*0.040*
35	0.065	*0.010*	0.075	*0.030*	0.065	*0.010*	0.135	*0.010*
136	0.105	*0.030*	0.135	*0.010*	0.305	*0.010*	0.095	*0.070*

Table 9-357. Selected nutrients in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.200	*0.040*	0.190	*0.040*	0.245	*0.130*	0.200	*0.160*
4	0.195	*0.050*	0.180	*0.020*	0.085	*0.070*	0.085	*0.030*
7	0.125	*0.030*	0.120	*0.040*	0.645	*0.090*	0.310	*0.120*
11	0.135	*0.010*	0.145	*0.010*	0.370	*0.060*	0.760	*0.180*
18	0.130	*<0.005*	0.120	*0.020*	1.135	*1.530*	1.015	*0.090*
25	0.145	*0.070*	0.145	*0.050*	0.535	*0.330*	1.280	*0.380*
35	0.145	*0.090*	0.070	*0.040*	0.660	*0.280*	0.875	*0.250*
136	0.020	*<0.005*	0.075	*0.030*	0.950	*0.440*	0.550	*0.320*

Table 9-358. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.155	*0.090*	0.110	*0.080*	1.430	*2.180*	1.310	*2.260*
4	0.190	*0.020*	0.125	*0.070*	1.200	*1.860*	0.855	*1.450*
7	0.115	*0.050*	0.060	*0.040*	1.610	*1.740*	0.405	*0.310*
11	0.155	*0.070*	0.105	*0.110*	1.130	*1.800*	0.775	*0.170*
18	0.175	*0.090*	0.070	*0.060*	1.815	*3.070*	1.025	*0.570*
25	0.165	*0.030*	0.075	*0.050*	1.200	*1.780*	1.680	*0.920*
35	0.205	*0.090*	0.050	*0.040*	1.325	*1.850*	1.515	*0.650*
136	0.230	*0.220*	0.040	*<0.005*	1.660	*1.680*	1.135	*0.270*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-359. Selected metals in the surface water after inundation of the Waltowa soil material (Site 2): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.06	*0.07*	<0.01	-	0.09	*0.14*	0.03	*0.06*	0.01	*0.02*	0.01	*0.02*
4	0.03	*<0.01*	0.01	*<0.01*	0.09	*0.11*	0.12	*0.11*	0.01	*0.02*	0.01	*<0.01*
7	0.02	*<0.01*	0.04	*0.02*	0.09	*0.09*	0.10	*0.04*	<0.01	-	0.02	*<0.01*
11	<0.01	-	0.04	*<0.01*	0.09	*0.12*	0.10	*<0.01*	<0.01	-	0.03	*0.03*
18	<0.01	-	<0.01	-	0.20	*0.26*	0.13	*0.12*	<0.01	-	0.04	*0.07*
25	0.01	*<0.01*	<0.01	-	0.18	*0.17*	0.14	*0.07*	<0.01	-	<0.01	-
35	<0.01	-	<0.01	-	0.16	*0.19*	0.05	*0.03*	0.01	*0.02*	<0.01	-
136	0.02	*<0.01*	<0.01	-	0.10	*0.10*	0.15	*<0.01*	<0.01	-	<0.01	-

Table 9-360. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	*0.05*	0.02	*0.01*	0.08	*0.12*	0.04	*<0.01*	<0.01	-	<0.01	-
4	0.03	*<0.01*	<0.01	-	0.05	*0.03*	0.08	*<0.01*	0.01	*0.01*	0.06	*0.07*
7	0.03	*0.03*	0.03	*0.02*	0.06	*0.04*	0.05	*0.02*	0.03	*0.02*	0.33	*0.19*
11	0.05	*0.05*	0.07	*0.14*	0.07	*<0.01*	0.06	*0.01*	0.03	*0.01*	1.05	*0.57*
18	0.02	*0.04*	0.02	*0.03*	0.15	*0.18*	0.23	*0.04*	0.07	*0.06*	1.31	*1.04*
25	0.03	*0.04*	<0.01	-	0.31	*0.32*	1.08	*0.39*	0.11	*0.10*	1.22	*0.55*
35	<0.01	-	<0.01	-	0.78	*1.21*	2.48	*0.86*	0.18	*0.20*	1.12	*0.34*
136	0.02	*0.01*	<0.01	-	2.14	*2.23*	9.46	*7.57*	0.60	*0.54*	1.90	*2.36*

Table 9-361. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	<0.01	-	0.06	*0.08*	0.03	*0.01*	<0.01	-	0.91	*1.79*	0.55	*1.10*
4	0.03	*0.02*	<0.01	-	0.05	*0.04*	0.07	*0.02*	2.48	*3.88*	2.64	*4.67*
7	<0.01	-	0.03	*<0.01*	0.09	*0.08*	0.07	*0.04*	2.45	*3.32*	1.52	*1.45*
11	<0.01	-	0.03	*0.03*	0.04	*0.01*	0.04	*0.03*	2.45	*3.43*	1.78	*0.18*
18	0.03	*0.05*	0.07	*0.13*	0.31	*0.47*	0.09	*0.04*	2.01	*3.40*	2.98	*0.93*
25	0.03	*0.05*	<0.01	-	0.57	*1.03*	0.09	*0.05*	2.14	*3.65*	4.48	*1.38*
35	<0.01	-	0.01	*<0.01*	0.98	*1.37*	0.26	*0.03*	2.26	*3.03*	5.61	*2.22*
136	0.01	*<0.01*	<0.01	-	1.03	*0.92*	6.81	*5.72*	2.04	*1.73*	2.49	*1.44*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-362. Selected metalloids and metals in the surface water after inundation of the Waltowa soil material (Site 2): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.58	*0.23*	18.56	*3.08*	2.28	*1.61*	<1.0	-	2.16	*0.72*	<5.0	-
4	2.02	*1.12*	<15.0	-	1.48	*0.59*	<1.0	-	1.81	*0.22*	<5.0	-
7	1.31	*0.62*	<15.0	-	2.41	*0.02*	3.13	*1.08*	1.93	*0.08*	<5.0	-
11	2.34	*0.30*	16.11	*3.25*	2.14	*0.66*	3.44	*1.04*	1.71	*0.41*	<5.0	-
18	2.59	*0.32*	20.27	*8.63*	2.23	*0.11*	3.33	*0.70*	<1.0	-	<5.0	-
25	2.24	*1.38*	38.43	*1.12*	2.35	*0.04*	3.68	*1.46*	1.99	*0.67*	<5.0	-
35	2.94	*1.33*	<15.0	-	2.85	*0.28*	2.83	*0.14*	2.01	*0.33*	<5.0	-
136	4.67	*0.91*	32.94	*5.87*	1.99	*0.13*	<1.0	-	2.66	*0.12*	<5.0	-

Table 9-363. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	8.17	*0.34*	<15.0	-	5.43	*0.69*	3.60	*0.99*	3.86	*1.67*	5.35	*0.46*
4	5.79	*2.22*	<15.0	-	5.39	*0.89*	2.69	*2.69*	3.68	*0.31*	<5.0	-
7	5.45	*2.26*	<15.0	-	5.04	*0.43*	3.14	*1.85*	3.23	*0.72*	<5.0	-
11	5.63	*1.99*	<15.0	-	3.51	*1.62*	4.41	*0.53*	2.74	*0.25*	5.36	*2.39*
18	6.74	*1.24*	20.90	*4.10*	1.82	*0.34*	4.44	-	1.41	*0.19*	5.75	*3.67*
25	8.64	*3.30*	35.83	*8.10*	3.65	*2.83*	3.04	*1.26*	2.88	*0.82*	5.45	*0.18*
35	12.05	*2.46*	<15.0	*3.94*	3.70	*3.18*	2.50	*0.59*	2.24	*0.48*	<5.0	-
136	19.05	*3.31*	42.96	*7.73*	<1.0	-	4.44	*0.81*	3.25	*0.33*	<5.0	-

Table 9-364. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	5.79	*1.40*	<15.0	-	2.26	*0.94*	3.28	*2.04*	13.75	*10.89*	11.11	*2.83*
4	5.27	*0.53*	<15.0	-	2.39	*1.40*	3.88	*2.47*	14.95	*11.03*	14.02	*7.63*
7	4.81	*0.02*	<15.0	-	3.29	*0.97*	4.55	*3.51*	13.97	*9.41*	16.67	*0.52*
11	6.02	*2.79*	<15.0	-	3.15	*1.25*	3.69	*3.82*	14.02	*10.14*	16.74	*1.70*
18	6.64	*2.57*	20.68	*5.62*	4.63	*0.07*	3.81	*0.85*	10.12	*11.92*	13.74	*1.04*
25	6.41	*5.74*	32.56	*3.00*	2.90	*1.67*	3.38	*0.15*	11.72	*15.31*	14.78	*0.66*
35	8.55	*4.90*	<15.0	-	2.19	*0.30*	1.73	*2.46*	10.81	*9.49*	9.89	*2.09*
136	15.24	*3.67*	36.21	*6.00*	<1.0	-	4.52	*0.69*	11.25	*8.76*	13.28	*0.29*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-365. Selected metals in the surface water after inundation of the Waltowa soil material (Site 2): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	16.38	8.63	14.84	1.32	<0.1	-	0.16	<0.1	<1.0	-	<1.0	-
4	61.17	2.67	30.35	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
7	26.97	1.00	33.16	18.83	<0.1	-	0.21	0.31	<1.0	-	<1.0	-
11	22.49	5.93	17.62	1.03	<0.1	-	0.27	0.12	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	0.14	<0.1	<1.0	-	<1.0	-
25	5.52	2.13	11.85	1.23	<0.1	-	0.15	0.11	<1.0	-	<1.0	-
35	57.38	-	**46.16**	2.50	<0.1	-	0.12	0.12	<1.0	-	<1.0	-
136	7.70	7.64	<5.0	-	<0.1	-	0.14	<0.1	<1.0	-	<1.0	-

Table 9-366. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	14.28	4.32	34.69	14.63	<0.1	-	0.13	<0.1	1.02	0.09	<1.0	-
4	143.41	69.68	**45.99**	3.71	<0.1	-	0.14	<0.1	<1.0	-	<1.0	-
7	45.41	14.86	**48.13**	24.93	0.13	0.16	0.18	0.11	<1.0	-	<1.0	-
11	41.35	15.97	**50.35**	12.56	<0.1	-	0.18	0.11	<1.0	-	2.45	2.68
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	5.72	8.20
25	16.79	22.58	34.62	1.91	<0.1	-	<0.1	-	<1.0	-	3.78	3.56
35	52.03	8.21	**84.64**	3.82	<0.1	-	<0.1	-	<1.0	-	3.57	3.13
136	8.09	0.52	20.56	-	<0.1	-	0.11	<0.1	1.32	0.78	5.71	4.84

Table 9-367. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	33.00	27.39	**65.71**	48.84	<0.1	-	<0.1	-	6.15	10.45	2.52	3.94
4	145.69	109.13	**53.13**	5.66	0.18	0.15	0.51	0.53	9.63	15.90	9.31	17.14
7	49.43	12.17	**54.16**	3.68	0.16	<0.1	0.41	0.13	9.51	14.58	9.14	12.44
11	79.04	30.54	**74.70**	24.62	0.18	<0.1	0.62	0.67	11.06	17.38	12.21	8.75
18	n.a.	-	n.a.	-	<0.1	-	0.15	0.14	12.09	20.52	20.05	6.18
25	41.70	38.27	41.27	0.16	0.12	<0.1	0.11	<0.1	13.90	23.75	26.99	6.22
35	76.05	13.12	**106.37**	20.25	<0.1	-	0.24	0.18	12.62	16.58	29.80	0.41
136	16.63	4.11	11.83	2.64	<0.1	-	<0.1	-	9.38	9.76	28.88	10.89

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-368. Selected metals in the surface water after inundation of the Waltowa soil material (Site 2): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.47	*0.44*	<4.4	-	1.10	*2.19*	<1.0	-
7	1.65	*0.61*	<4.4	-	<1.0	-	1.39	*1.78*
11	2.04	*0.10*	<4.4	-	<1.0	-	<1.0	-
18	1.64	*0.31*	<4.4	-	<1.0	-	<1.0	-
25	2.70	*0.19*	5.70	*4.50*	<1.0	-	<1.0	-
35	2.99	*2.51*	<4.4	-	<1.0	-	<1.0	-
136	1.64	*0.35*	<4.4	-	<1.0	-	<1.0	-

Table 9-369. Selected metals in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	1.36	*0.84*	<4.4	-	<1.0	-	<1.0	-
4	1.95	*0.03*	<4.4	-	<1.0	-	<1.0	-
7	1.44	*0.60*	<4.4	-	<1.0	-	<1.0	-
11	2.32	*0.39*	<4.4	-	<1.0	-	<1.0	-
18	1.84	*0.20*	<4.4	-	<1.0	-	1.54	*<1.0*
25	2.76	*0.77*	<4.4	-	<1.0	-	<1.0	-
35	2.02	*0.13*	<4.4	-	<1.0	-	<1.0	-
136	1.92	*0.02*	4.57	*0.14*	<1.0	-	<1.0	-

Table 9-370. Selected metals in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	2.11	*0.21*	<4.4	-	<1.0	-	<1.0	-
4	2.20	*0.59*	<4.4	-	<1.0	-	<1.0	-
7	2.09	*0.18*	<4.4	-	<1.0	-	1.91	*2.78*
11	3.73	*0.11*	<4.4	-	<1.0	-	1.35	*1.68*
18	2.11	*0.49*	<4.4	-	1.89	*3.12*	<1.0	-
25	2.88	*0.71*	<4.4	-	<1.0	-	<1.0	-
35	2.42	*0.86*	<4.4	-	<1.0	-	<1.0	-
136	2.51	*0.23*	4.48	*0.44*	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-371. Major cations in the surface water after inundation of the Waltowa soil material (Site 2): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	115	*3*	9851	*175*	4.7	*0.3*	335.5	*0.4*	18.8	*1.0*	416.9	*13.5*
4	128	*1*	9755	*489*	6.2	*<0.1*	343.0	*16.8*	23.4	*0.4*	424.5	*39.4*
7	127	*3*	9674	*580*	6.5	*0.3*	328.4	*19.6*	26.1	*1.4*	433.1	*29.5*
11	124	*15*	10760	*1705*	6.4	*0.5*	337.9	*54.6*	27.2	*2.2*	454.8	*75.8*
18	133	*22*	8612	*413*	6.2	*1.3*	322.8	*16.1*	28.9	*3.6*	388.1	*5.0*
25	150	*9*	9461	*987*	6.6	*1.2*	362.3	*45.3*	30.9	*2.9*	434.7	*20.3*
35	145	*56*	9165	*295*	6.5	*2.8*	347.2	*11.9*	32.1	*9.5*	407.4	*31.9*
136	302	*147*	13553	*1094*	12.2	*4.8*	478.6	*17.0*	53.9	*11.7*	542.8	*51.1*

Table 9-372. Major cations in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1474	*670*	5247	*3537*	50.1	*12.5*	170.6	*135.0*	107.8	*56.8*	285.8	*120.1*
4	874	*546*	8774	*345*	35.4	*14.1*	318.9	*19.1*	70.6	*50.9*	418.4	*27.2*
7	630	*468*	9134	*515*	27.6	*13.0*	307.6	*12.6*	56.1	*43.1*	443.1	*31.2*
11	444	*431*	11104	*1644*	19.7	*13.2*	347.3	*31.7*	41.2	*34.4*	490.3	*67.6*
18	372	*495*	8498	*632*	14.5	*15.5*	313.9	*14.5*	45.5	*29.1*	414.6	*41.0*
25	403	*499*	9512	*789*	14.5	*14.8*	350.7	*28.1*	48.6	*19.3*	459.3	*64.3*
35	329	*387*	9091	*104*	11.8	*10.4*	337.4	*12.9*	48.8	*16.1*	404.6	*14.8*
136	456	*325*	12850	*928*	14.5	*6.0*	444.6	*26.1*	62.3	*20.6*	519.6	*38.9*

Table 9-373. Major cations in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1721	*545*	1914	*1088*	53.0	*1.9*	61.3	*42.0*	177.6	*83.5*	133.3	*7.6*
4	1674	*362*	6701	*1178*	55.1	*1.1*	207.4	*27.5*	186.3	*73.6*	397.7	*127.6*
7	1579	*501*	8745	*764*	50.0	*3.4*	266.1	*37.9*	193.4	*83.7*	476.4	*29.1*
11	1491	*494*	9199	*2*	46.8	*2.5*	279.3	*19.6*	161.6	*67.1*	446.8	*51.8*
18	961	*1288*	7867	*472*	31.5	*26.2*	273.8	*37.7*	102.4	*150.9*	392.7	*24.8*
25	1019	*1400*	8261	*620*	31.0	*28.3*	298.3	*18.7*	103.7	*151.4*	425.2	*8.4*
35	874	*939*	8823	*640*	28.1	*17.6*	307.7	*25.0*	91.5	*101.1*	434.5	*29.6*
136	744	*652*	12776	*391*	20.2	*8.6*	426.3	*8.6*	75.0	*61.1*	520.4	*15.3*

Table 9-374. Major cations and anions in the surface water after inundation of the Waltowa soil material (Site 2): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	15.2	*<0.1*	1230.6	*40.2*	136	*12*	20701	*292*	105	*<1*	3077	*47*
4	18.1	*<0.1*	1224.6	*72.0*	174	*6*	19037	*1530*	59	*14*	3038	*408*
7	17.0	*1.0*	1236.9	*60.8*	216	*7*	20219	*535*	85	*8*	2749	*140*
11	15.7	*1.3*	1433.7	*308.4*	217	*20*	20206	*3129*	59	*10*	2703	*492*
18	19.7	*3.2*	1099.1	*51.5*	215	*38*	17436	*662*	67	*<1*	2458	*109*
25	22.8	*1.5*	1145.3	*157.0*	199	*44*	19281	*2330*	38	*8*	2648	*257*
35	21.7	*6.9*	1133.6	*60.2*	224	*95*	19602	*175*	48	*17*	2733	*172*
136	40.1	*12.7*	1566.6	*83.1*	383	*207*	25115	*1527*	102	*6*	3634	*145*

Table 9-375. Major cations and anions in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 2): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	174.0	*89.0*	682.5	*487.7*	2368	*1152*	10326	*7691*	501	*470*	1706	*1265*
4	108.6	*68.8*	1129.8	*9.2*	1374	*1030*	17771	*126*	303	*277*	2788	*90*
7	74.3	*52.5*	1198.8	*39.0*	975	*779*	19722	*783*	236	*257*	2502	*91*
11	49.6	*44.5*	1530.0	*237.9*	721	*747*	20939	*1792*	148	*158*	2807	*178*
18	53.0	*55.0*	1119.0	*91.2*	557	*752*	17468	*597*	129	*154*	2422	*76*
25	59.5	*55.7*	1158.8	*137.3*	506	*647*	18731	*479*	115	*121*	2649	*89*
35	53.5	*40.3*	1153.6	*2.3*	516	*604*	19518	*667*	106	*92*	2685	*58*
136	66.9	*33.5*	1463.8	*71.7*	555	*418*	23495	*1508*	153	*70*	3395	*181*

Table 9-376. Major cations and anions in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 2): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	218.2	*58.9*	207.7	*106.6*	2790	*889*	3274	*1735*	557	*375*	535	*601*
4	224.2	*40.0*	907.8	*203.0*	2911	*1009*	13192	*3718*	489	*275*	2223	*177*
7	197.5	*51.0*	1200.3	*46.3*	2788	*890*	18284	*2324*	587	*404*	2595	*153*
11	165.5	*47.6*	1261.6	*131.7*	2670	*820*	18195	*1307*	520	*328*	2569	*143*
18	123.0	*169.8*	1030.0	*95.8*	1524	*2272*	15901	*2041*	332	*480*	2338	*177*
25	138.6	*192.6*	1029.2	*63.4*	1440	*2072*	16728	*1433*	346	*522*	2429	*169*
35	122.9	*127.3*	1146.8	*60.0*	1488	*1776*	18841	*940*	279	*325*	2748	*359*
136	103.8	*78.5*	1459.1	*9.3*	860	*829*	23228	*579*	271	*239*	3399	*8*

Table 9-377. Selected surface water properties after inundation of the Meningie soil material (Site 3): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.66	*0.15*	7.91	*0.04*	394	*22*	327	*13*	2.0	*<0.1*	3.8	*<0.1*
4	7.59	*0.02*	7.68	*0.09*	276	*41*	310	*22*	1.9	*<0.1*	3.4	*0.1*
7	7.42	*0.03*	7.80	*0.25*	218	*5*	289	*7*	2.2	*<0.1*	5.7	*0.3*
11	7.16	*0.75*	7.68	*0.01*	286	*102*	242	*24*	2.5	*0.1*	4.1	*0.1*
18	7.36	*0.14*	7.67	*0.08*	236	*26*	237	*32*	1.3	*<0.1*	3.4	*0.1*
25	7.35	*0.23*	7.98	*0.09*	225	*38*	243	*10*	2.0	*0.2*	3.6	*0.3*
35	7.41	*0.32*	8.05	*0.02*	198	*26*	218	*15*	2.2	*0.1*	3.9	*<0.1*
136	7.76	*0.09*	7.98	*0.02*	215	*32*	185	*28*	2.2	*0.1*	4.4	*<0.1*

Table 9-378. Selected pore-water properties (3-5 cm) after inundation of the Meningie soil material (Site 3): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.88	*0.03*	7.24	*0.19*	419	*2*	331	*6*	3.7	*<0.1*	4.1	*1.0*
4	6.83	*0.06*	6.98	*0.15*	233	*138*	153	*15*	4.8	*0.7*	4.5	*0.3*
7	6.81	*0.01*	7.09	*0.03*	189	*63*	151	*18*	4.9	*0.6*	6.5	*0.4*
11	6.59	*0.28*	7.27	*<0.01*	155	*34*	139	*18*	5.5	*1.2*	5.2	*0.3*
18	6.78	*0.11*	7.02	*0.52*	139	*27*	134	*28*	3.2	*0.4*	4.6	*0.1*
25	6.83	*<0.01*	7.23	*0.05*	113	*18*	120	*23*	5.2	*<0.1*	5.1	*0.1*
35	6.86	*0.08*	7.23	*0.11*	114	*4*	119	*35*	4.8	*0.1*	5.0	*0.5*
136	7.17	*0.12*	7.09	*0.03*	159	*6*	140	*33*	4.6	*0.1*	4.9	*0.9*

Table 9-379. Selected pore-water properties (10-12 cm) after inundation of the Meningie soil material (Site 3): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.64	*0.08*	7.11	*0.03*	356	*123*	330	*8*	5.1	*0.1*	4.9	*1.2*
4	6.57	*0.11*	6.37	*0.32*	238	*51*	284	*54*	5.1	*0.1*	4.7	*1.2*
7	6.37	*0.21*	6.67	*0.05*	259	*53*	266	*72*	5.5	*0.1*	6.4	*1.9*
11	6.47	*0.11*	6.77	*0.16*	223	*49*	219	*39*	5.8	*<0.1*	5.4	*1.1*
18	6.49	*0.12*	6.79	*0.17*	212	*47*	219	*79*	3.3	*0.1*	4.7	*1.1*
25	6.54	*0.15*	6.82	*0.13*	186	*42*	200	*69*	5.5	*0.1*	5.0	*1.4*
35	6.48	*0.08*	6.82	*0.13*	171	*31*	236	*197*	5.4	*0.2*	5.1	*0.8*
136	6.93	*0.01*	6.84	*0.12*	146	*5*	135	*26*	7.2	*0.3*	6.0	*1.3*

Table 9-380. Selected surface water properties after inundation of the Meningie soil material (Site 3): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.50	*0.20*	0.25	*<0.2*	<0.2	-	6.2	-	3.6	-
4	0.33	*<0.2*	0.38	*<0.2*	<0.2	-	1.75	*3.40*				
7	<0.2	-	<0.2	-	0.33	*0.65*	<0.2	-				
11	<0.2	-	0.25	*0.20*	<0.2	-	<0.2	-	5.7	-	4.1	-
18	0.56	*<0.2*	0.56	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	0.22	*<0.2*	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.3	-	3.4	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	8.0	*0.1*	3.4	*0.5*

Table 9-381. Selected pore-water properties (3-5 cm) after inundation of the Meningie soil material (Site 3): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.23	*<0.2*	0.63	*0.25*	0.28	*<0.2*	<0.2	-	21.0	-	22.0	-
4	2.25	*3.90*	4.25	*4.50*	0.43	*0.35*	0.43	*0.85*				
7	2.18	*3.25*	7.10	*7.20*	2.25	*4.50*	<0.2	-				
11	3.20	*2.80*	6.85	*5.50*	1.05	*0.48*	1.06	*1.02*	14.0	-	11.0	-
18	9.38	*0.52*	10.04	*11.48*	0.41	*0.39*	0.57	*0.40*				
25	11.79	*1.09*	8.08	*7.66*	1.44	*0.96*	1.15	*0.31*				
35	11.08	*2.92*	9.51	*12.91*	1.00	*0.53*	0.39	*0.71*	20.0	-	9.6	-
136	8.29	*7.17*	8.86	*4.78*	0.49	*0.79*	0.70	*1.41*	14.0	*2.0*	8.5	*0.5*

Table 9-382. Selected pore-water properties (10-12 cm) after inundation of the Meningie soil material (Site 3): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.55	*0.70*	0.63	*0.35*	0.20	*0.30*	<0.2	-	16.0	-	17.0	-
4	2.25	*3.30*	0.70	*0.80*	0.40	*0.60*	<0.2	-				
7	2.35	*3.70*	1.35	*2.10*	<0.2	-	<0.2	-				
11	2.68	*3.65*	1.58	*2.05*	1.95	*2.85*	0.35	*0.71*	14.0	-	15.0	-
18	8.66	*8.26*	3.03	*4.06*	<0.2	-	<0.2	-				
25	9.33	*9.16*	2.42	*3.08*	1.34	*1.65*	<0.2	-				
35	16.04	*13.62*	8.74	*12.07*	0.40	*0.70*	0.22	*0.44*	6.9	-	19.0	-
136	28.93	*2.80*	23.32	*3.48*	1.88	*<0.2*	1.07	*1.05*	22.0	*2.0*	16.5	*5.0*

Table 9-383. Selected nutrients in the surface water after inundation of the Meningie soil material (Site 3): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.075	*0.010*	0.013	*0.005*	0.030	*<0.005*	0.033	*0.005*
4	0.080	*<0.005*	0.010	*0.020*	0.010	*<0.005*	<0.005	-
7	0.125	*0.030*	0.045	*0.030*	0.010	*<0.005*	0.005	*0.010*
11	0.120	*<0.005*	0.045	*0.010*	<0.005	-	<0.005	-
18	0.125	*0.030*	0.060	*0.020*	0.060	*0.080*	0.010	*<0.005*
25	0.490	*0.120*	0.025	*0.050*	0.265	*0.050*	0.005	*0.010*
35	0.550	*0.120*	0.135	*0.030*	0.135	*0.250*	0.055	*0.010*
136	1.660	*2.680*	0.830	*0.040*	0.010	*<0.005*	<0.005	-

Table 9-384. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.325	*0.430*	0.029	*0.017*	0.100	*0.120*	0.037	*0.007*
4	0.008	*0.016*	0.015	*0.030*	0.007	*0.006*	0.010	*0.020*
7	0.045	*0.030*	0.085	*0.070*	0.010	*0.020*	0.035	*0.050*
11	0.055	*0.030*	0.080	*0.020*	0.005	*0.010*	0.010	*0.020*
18	0.025	*0.010*	0.070	*0.020*	0.040	*<0.005*	0.045	*0.050*
25	0.200	*0.060*	0.090	*0.120*	0.050	*0.020*	0.045	*0.030*
35	0.165	*0.070*	0.435	*0.550*	0.060	*0.040*	0.055	*0.070*
136	0.040	*0.080*	0.105	*0.030*	0.030	*0.020*	0.015	*0.010*

Table 9-385. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.110	*0.201*	0.245	*0.350*	0.041	*0.019*	0.050	*<0.005*
4	0.105	*0.170*	0.130	*0.200*	0.005	*0.010*	<0.005	-
7	0.050	*0.020*	0.080	*0.020*	0.015	*0.030*	0.005	*0.010*
11	0.050	*<0.005*	0.040	*0.000*	0.010	*0.020*	<0.005	-
18	0.035	*0.010*	0.055	*0.090*	0.035	*0.050*	0.005	*0.010*
25	0.160	*<0.005*	0.105	*0.090*	0.040	*0.060*	0.035	*0.050*
35	0.090	*0.060*	0.350	*0.260*	0.030	*0.020*	0.035	*0.070*
136	<0.005	-	0.195	*0.030*	0.095	*0.030*	0.070	*0.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-386. Selected nutrients in the surface water after inundation of the Meningie soil material (Site 3): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.020	*<0.005*	0.015	*0.010*	0.190	*<0.005*	0.015	*0.010*
4	0.070	*0.020*	0.070	*<0.005*	0.055	*0.010*	0.050	*<0.005*
7	0.010	*0.020*	0.010	*<0.005*	0.555	*0.050*	0.110	*<0.005*
11	0.010	*0.020*	0.025	*0.010*	0.230	*0.060*	0.315	*0.030*
18	0.010	*<0.005*	0.010	*<0.005*	0.405	*0.050*	0.355	*0.090*
25	0.005	*0.010*	0.025	*0.010*	0.100	*0.060*	0.705	*0.110*
35	0.015	*0.010*	0.015	*0.010*	0.060	*<0.005*	0.495	*0.250*
136	0.005	*0.010*	0.100	*0.040*	0.305	*0.010*	0.060	*<0.005*

Table 9-387. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.045	*0.010*	0.030	*<0.005*	0.425	*0.150*	0.295	*0.470*
4	0.120	*0.020*	0.110	*<0.005*	1.365	*0.870*	1.060	*0.200*
7	0.020	*<0.005*	0.040	*0.020*	2.230	*0.600*	1.510	*0.080*
11	0.020	*<0.005*	0.040	*0.020*	1.965	*0.090*	**2.075**	*0.730*
18	0.020	*<0.005*	0.050	*0.040*	**2.325**	*0.090*	**2.645**	*0.350*
25	0.035	*0.010*	0.060	*0.020*	2.255	*0.230*	**2.500**	*0.560*
35	0.045	*0.010*	0.060	*0.020*	1.775	*0.050*	**2.150**	*1.500*
136	0.030	*0.020*	0.025	*0.010*	1.535	*0.090*	0.975	*0.850*

Table 9-388. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.035	*0.010*	0.035	*0.010*	1.145	*1.030*	0.425	*0.670*
4	0.100	*0.040*	0.095	*0.010*	0.880	*0.960*	0.465	*0.710*
7	0.030	*<0.005*	0.030	*<0.005*	1.485	*0.790*	0.720	*0.820*
11	0.035	*0.010*	0.030	*<0.005*	1.465	*0.450*	1.235	*0.910*
18	0.030	*0.020*	0.025	*0.010*	**2.345**	*0.750*	1.325	*0.770*
25	0.040	*0.040*	0.035	*0.010*	2.035	*0.090*	**2.085**	*0.910*
35	0.030	*<0.005*	0.035	*0.050*	2.230	*0.160*	**1.980**	*0.920*
136	0.105	*0.050*	0.085	*0.030*	2.160	*0.140*	**1.890**	*1.500*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-389. Selected metals in the surface water after inundation of the Meningie soil material (Site 3): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.01	*<0.01*	0.03	*0.04*	0.02	*<0.01*	0.13	*0.12*	<0.01	-	<0.01	-
4	0.02	*<0.01*	0.01	*<0.01*	0.05	*<0.01*	0.08	*0.02*	<0.01	-	<0.01	-
7	<0.01	-	0.04	*0.02*	0.06	*0.02*	0.07	*<0.01*	0.25	*0.07*	0.33	*0.58*
11	<0.01	-	0.01	*<0.01*	0.06	*0.03*	0.02	*0.02*	0.32	*0.05*	0.26	*0.53*
18	<0.01	-	0.02	*0.01*	0.06	*0.02*	0.09	*<0.01*	0.43	*0.14*	0.14	*0.27*
25	0.01	*<0.01*	0.08	*0.15*	0.06	*0.02*	0.07	*<0.01*	0.75	*0.43*	0.01	*0.01*
35	0.01	*<0.01*	0.01	*<0.01*	0.03	*0.03*	0.03	*0.02*	1.44	*1.12*	<0.01	-
136	<0.01	-	<0.01	-	0.06	*0.03*	0.14	*<0.01*	0.83	*1.65*	<0.01	-

Table 9-390. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	*0.03*	<0.01	-	0.09	*0.07*	0.19	*0.25*	0.13	*0.25*	1.22	*2.31*
4	0.01	*<0.01*	<0.01	-	2.03	*3.92*	4.25	*4.56*	**7.57**	*3.96*	6.29	*2.93*
7	<0.01	-	0.05	*0.05*	3.15	*5.14*	6.56	*6.76*	**11.09**	*0.43*	12.31	*4.14*
11	<0.01	-	0.04	*0.05*	3.79	*2.56*	8.08	*6.69*	**12.75**	*3.01*	17.31	*6.07*
18	<0.01	-	<0.01	-	8.20	*0.39*	9.75	*8.47*	**11.37**	*1.00*	14.81	*4.84*
25	0.02	*<0.01*	<0.01	-	10.60	*0.77*	8.27	*7.36*	**10.52**	*4.09*	12.94	*7.65*
35	<0.01	-	<0.01	-	10.55	*1.61*	8.23	*11.26*	**9.92**	*3.69*	12.31	*11.17*
136	<0.01	-	<0.01	-	8.47	*6.42*	8.92	*5.92*	**6.52**	*3.66*	5.09	*4.99*

Table 9-391. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.04	*0.02*	<0.01	-	0.40	*0.54*	0.15	*0.15*	3.21	*3.46*	2.78	*5.31*
4	0.02	*0.02*	0.01	*<0.01*	2.03	*3.39*	0.39	*0.62*	**4.44**	*6.12*	5.29	*10.36*
7	0.01	*<0.01*	0.06	*0.07*	2.84	*4.13*	1.30	*2.33*	**5.37**	*4.24*	7.49	*13.05*
11	<0.01	-	0.52	*0.98*	3.99	*5.47*	1.70	*2.90*	**7.25**	*1.50*	9.61	*13.49*
18	<0.01	-	0.01	*<0.01*	6.71	*7.19*	2.22	*3.58*	**8.26**	*1.78*	9.98	*10.96*
25	<0.01	-	0.01	*<0.01*	9.35	*9.52*	4.37	*6.84*	**10.77**	*5.19*	13.52	*11.10*
35	<0.01	-	<0.01	-	13.30	*11.14*	7.49	*10.62*	**12.51**	*7.49*	14.76	*8.96*
136	<0.01	-	<0.01	-	29.77	*2.95*	22.08	*5.08*	**8.83**	*3.43*	11.24	*1.61*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-392. Selected metalloids and metals in the surface water after inundation of the Meningie soil material (Site 3): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.42	*1.65*	<15.0	-	2.59	*0.04*	<1.0	-	2.35	*1.41*	<5.0	-
4	1.03	*1.76*	<15.0	-	2.14	*0.82*	2.86	*3.53*	3.46	*1.76*	<5.0	-
7	1.32	*1.22*	<15.0	-	2.81	*0.93*	3.24	*1.07*	4.33	*0.98*	<5.0	-
11	1.30	*0.84*	<15.0	-	2.62	*0.19*	1.63	*2.62*	4.39	*0.62*	6.55	*3.87*
18	1.01	*0.99*	19.02	*4.56*	3.15	*0.38*	3.07	*2.01*	4.34	*0.20*	8.70	*0.91*
25	<1.0	-	40.41	*4.47*	5.55	*5.40*	3.11	*0.38*	6.56	*0.30*	9.07	*0.65*
35	2.28	*0.11*	<15.0	-	3.96	*2.55*	1.30	*0.75*	8.25	*1.73*	<5.0	-
136	7.05	*2.16*	35.92	*10.25*	<1.0	-	1.91	*3.82*	20.87	*1.19*	21.61	*4.83*

Table 9-393. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	<15.0	-	41.55	*13.81*	7.64	*5.76*	7.82	*0.22*	44.90	*1.43*	51.81	*11.89*
4	27.46	*36.05*	28.28	*10.32*	3.31	*2.92*	1.51	*3.02*	41.72	*1.99*	30.95	*15.68*
7	<15.0	-	26.50	*15.07*	2.03	*2.76*	5.24	*2.66*	35.03	*9.10*	33.74	*2.32*
11	15.73	*3.76*	29.41	*7.94*	4.31	*3.60*	3.86	*1.66*	35.16	*15.33*	37.93	*2.20*
18	22.09	*3.95*	44.59	*4.18*	3.63	*6.94*	3.72	*3.46*	35.44	*14.72*	35.41	*18.67*
25	24.23	*7.86*	64.29	*18.51*	1.35	*2.33*	<1.0	-	32.07	*10.28*	27.07	*4.14*
35	26.37	*2.35*	27.93	*26.00*	<1.0	-	<1.0	-	23.17	*3.14*	17.24	*2.19*
136	32.92	*4.78*	50.31	*19.66*	<1.0	-	3.15	*0.96*	36.01	*5.39*	29.40	*5.74*

Table 9-394. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	<15.0	-	30.88	*2.15*	12.02	*1.29*	**9.10**	*1.79*	50.00	*1.60*	52.59	*0.21*
4	42.50	*12.95*	26.51	*37.20*	9.62	*0.23*	**11.28**	*2.50*	52.50	*8.53*	49.73	*16.43*
7	<15.0	-	<15.0	-	10.88	*1.34*	**15.92**	*5.86*	59.44	*1.50*	52.59	*6.44*
11	<15.0	-	<15.0	-	**24.59**	*4.20*	**12.81**	*4.06*	56.04	*3.38*	56.00	*1.50*
18	27.23	*18.16*	24.05	*4.81*	**15.21**	*1.44*	**11.18**	*3.20*	57.06	*2.67*	43.50	*7.34*
25	27.69	*28.93*	76.04	*26.88*	**14.01**	*0.42*	**10.58**	*7.02*	66.33	*2.43*	49.05	*20.98*
35	46.62	*32.01*	37.98	*13.21*	5.12	*2.09*	6.15	*3.35*	38.78	*4.70*	29.29	*7.63*
136	82.88	*27.52*	82.94	*46.76*	<1.0	-	**8.41**	*1.39*	43.00	*0.88*	34.47	*6.94*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-395. Selected metals in the surface water after inundation of the Meningie soil material (Site 3): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	20.10	*3.01*	15.72	*1.66*	0.12	*0.24*	0.21	*0.42*	<1.0	-	<1.0	-
4	95.73	-	**48.15**	*34.95*	0.21	*0.41*	0.35	*0.69*	<1.0	-	<1.0	-
7	33.56	*12.32*	42.69	*11.23*	0.34	*0.49*	0.30	*0.34*	<1.0	-	<1.0	-
11	20.02	-	22.87	*2.08*	0.28	*0.39*	0.31	*0.26*	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	0.36	*0.47*	0.29	*0.48*	<1.0	-	<1.0	-
25	13.08	*2.72*	12.76	*6.66*	0.27	*0.35*	0.33	*0.48*	<1.0	-	<1.0	-
35	52.10	*2.31*	42.74	*21.32*	0.39	*0.77*	0.38	*0.27*	1.61	*3.23*	<1.0	-
136	6.38	*5.44*	<5.0	-	0.17	*<0.1*	0.30	*0.20*	<1.0	-	<1.0	-

Table 9-396. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	40.73	*8.41*	**53.53**	*0.36*	0.69	*0.62*	0.24	*0.48*	<1.0	-	6.19	*1.07*
4	96.81	*91.92*	**51.41**	*24.15*	<0.1	-	0.14	*0.28*	9.33	*0.78*	3.21	*3.08*
7	47.12	*32.22*	**44.19**	*50.48*	0.27	*<0.1*	0.33	*0.19*	13.49	*19.83*	3.11	*6.21*
11	38.77	*12.26*	40.56	*36.62*	0.13	*<0.1*	0.23	*0.10*	17.79	*32.13*	4.28	*8.55*
18	n.a.	-	n.a.	-	0.18	*<0.1*	0.39	*0.59*	11.67	*19.27*	4.74	*2.91*
25	20.71	*12.74*	26.76	*8.95*	0.15	*0.14*	0.25	*0.42*	6.91	*13.28*	<1.0	-
35	45.62	*27.76*	**58.90**	*18.35*	0.14	*0.13*	0.27	*0.18*	1.32	*1.73*	<1.0	-
136	11.42	*6.06*	8.60	*6.83*	0.12	*<0.1*	0.19	*<0.1*	<1.0	-	<1.0	-

Table 9-397. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	68.31	*4.72*	**51.60**	*9.21*	0.50	*1.00*	0.50	*1.00*	21.21	*2.50*	5.16	*10.32*
4	122.62	*5.77*	**70.78**	*24.50*	<0.1	-	0.50	*1.00*	20.32	*15.90*	5.27	*10.54*
7	44.19	*3.81*	**96.59**	*23.38*	0.61	*0.17*	0.58	*<0.1*	23.99	*9.44*	9.23	*16.54*
11	58.21	*14.37*	**72.74**	*11.02*	0.44	*0.19*	0.45	*0.25*	30.15	*10.22*	9.46	*15.13*
18	n.a.	-	n.a.	-	0.41	*0.12*	0.35	*0.27*	21.74	*14.20*	10.35	*9.11*
25	34.48	*5.37*	**47.55**	*4.55*	0.26	*<0.1*	0.25	*0.14*	23.65	*22.79*	12.05	*5.18*
35	52.03	*5.00*	**107.37**	*11.93*	0.32	*<0.1*	0.49	*0.22*	17.28	*23.19*	10.48	*1.93*
136	17.49	*6.42*	14.06	*7.60*	0.19	*0.12*	0.24	*0.10*	1.47	*1.75*	1.14	*2.28*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-398. Selected metals in the surface water after inundation of the Meningie soil material (Site 3): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	2.18	*0.60*	<4.4	-	<1.0	-	1.27	*2.54*
4	3.43	*1.14*	<4.4	-	1.38	*2.76*	1.65	*3.30*
7	3.17	*0.07*	<4.4	-	1.33	*1.98*	1.11	*1.75*
11	3.67	*1.00*	<4.4	-	<1.0	-	<1.0	-
18	3.46	*0.49*	<4.4	-	1.16	*2.21*	<1.0	-
25	5.28	*2.96*	<4.4	-	1.10	*1.91*	1.26	*2.22*
35	3.79	*2.51*	<4.4	-	1.61	*3.21*	<1.0	-
136	2.45	*0.35*	<4.4	-	<1.0	-	<1.0	-

Table 9-399. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<4.4	-	<4.4	-	<1.0	-	<1.0	-
4	<4.4	-	<4.4	-	<1.0	-	<1.0	-
7	<4.4	-	<4.4	-	<1.0	-	<1.0	-
11	<4.4	-	<4.4	-	<1.0	-	<1.0	-
18	<4.4	-	<4.4	-	<1.0	-	1.81	*3.26*
25	<4.4	-	<4.4	-	<1.0	-	1.38	*2.37*
35	<4.4	-	<4.4	-	<1.0	-	<1.0	-
136	<4.4	-	<4.4	-	<1.0	-	<1.0	-

Table 9-400. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<4.4	-	<4.4	-	1.00	*<1.0*	<1.0	-
4	<4.4	-	<4.4	-	1.50	*1.00*	<1.0	-
7	<4.4	-	<4.4	-	1.16	*<1.0*	<1.0	-
11	<4.4	-	<4.4	-	<1.0	-	<1.0	-
18	<4.4	-	<4.4	-	1.44	*<1.0*	1.07	*<1.0*
25	<4.4	-	<4.4	-	<1.0	-	<1.0	-
35	<4.4	-	<4.4	-	<1.0	-	<1.0	-
136	<4.4	-	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-401. Major cations in the surface water after inundation of the Meningie soil material (Site 3): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		**Seawater**		**River Murray**		**Seawater**		**River Murray**		**Seawater**	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	146	*18*	10460	*152*	5.1	*0.9*	344.0	*2.9*	40.6	*15.9*	441.5	*57.0*
4	211	*28*	11000	*407*	8.5	*1.2*	391.9	*7.1*	60.3	*21.3*	517.7	*89.8*
7	292	*28*	10545	*614*	10.8	*1.1*	368.4	*15.1*	102.7	*20.4*	515.9	*81.2*
11	325	*41*	11987	*1603*	11.1	*1.5*	381.0	*41.6*	113.0	*31.8*	593.6	*119.7*
18	409	*8*	10358	*1702*	12.9	*0.2*	396.0	*17.6*	133.9	*30.7*	611.8	*62.4*
25	555	*28*	10497	*698*	16.1	*0.4*	408.7	*21.1*	170.0	*19.6*	648.7	*30.2*
35	748	*106*	10953	*485*	19.8	*1.5*	424.7	*37.9*	253.2	*6.2*	724.9	*25.5*
136	1998	*11*	15487	*705*	45.6	*1.0*	528.0	*4.1*	602.9	*15.4*	1177.2	*81.6*

Table 9-402. Major cations in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		**Seawater**		**River Murray**		**Seawater**		**River Murray**		**Seawater**	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	20378	*6537*	20334	*5421*	310.9	*100.6*	385.2	*79.0*	2243.4	*459.7*	2090.0	*780.3*
4	12962	*4218*	16556	*1400*	217.8	*56.4*	416.8	*17.2*	1850.6	*414.8*	1824.5	*56.3*
7	8749	*2897*	13472	*1516*	154.0	*57.2*	361.3	*12.7*	1503.3	*389.1*	1539.4	*261.0*
11	7021	*3910*	12669	*839*	120.0	*56.3*	365.1	*14.4*	1283.1	*437.1*	1424.3	*157.1*
18	8671	*6279*	10583	*1804*	155.0	*103.4*	323.2	*38.7*	1456.3	*571.6*	1202.8	*248.8*
25	6191	*2340*	13087	*632*	103.3	*31.8*	410.5	*21.8*	1153.7	*414.9*	1493.0	*52.0*
35	4762	*939*	12756	*356*	88.4	*15.6*	415.3	*15.6*	1098.2	*126.3*	1414.4	*40.0*
136	3800	*622*	15727	*863*	70.8	*5.3*	490.8	*17.4*	971.8	*97.5*	1402.8	*51.3*

Table 9-403. Major cations in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		**Seawater**		**River Murray**		**Seawater**		**River Murray**		**Seawater**	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	23248	*1032*	23718	*3331*	359.4	*20.2*	383.7	*78.9*	2407.1	*207.0*	2629.9	*417.0*
4	23098	*557*	24453	*2389*	401.1	*19.5*	427.7	*45.4*	2622.1	*78.6*	2695.9	*104.5*
7	21567	*1670*	21068	*2371*	386.7	*18.2*	352.1	*54.5*	2733.9	*158.9*	2384.1	*91.6*
11	20816	*1325*	22410	*2611*	343.9	*16.9*	396.4	*59.5*	2532.7	*52.2*	2585.9	*242.7*
18	17205	*559*	17879	*3951*	302.4	*11.1*	355.3	*43.0*	2293.4	*171.1*	2193.6	*330.6*
25	16858	*936*	19170	*2118*	277.5	*10.1*	381.1	*7.5*	2049.3	*21.8*	2177.0	*110.3*
35	15291	*337*	17772	*2788*	262.1	*16.1*	371.1	*18.3*	2004.5	*8.7*	2118.6	*440.8*
136	8578	*108*	17090	*2084*	142.0	*5.3*	412.3	*17.3*	1320.0	*29.2*	1774.6	*310.9*

Table 9-404. Major cations and anions in the surface water after inundation of the Meningie soil material (Site 3): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	20.3	*6.1*	1288.6	*35.5*	318	*230*	21771	*180*	165	*26*	3210	*161*
4	25.8	*4.4*	1431.8	*83.7*	437	*178*	21557	*461*	126	*47*	3407	*352*
7	32.5	*4.3*	1211.5	*393.3*	670	*232*	21103	*4376*	242	*17*	3199	*142*
11	31.7	*5.7*	1586.2	*225.3*	745	*133*	24116	*2198*	232	*18*	3375	*578*
18	48.7	*1.0*	1304.7	*336.3*	827	*163*	19728	*4008*	283	*45*	3177	*449*
25	62.3	*1.1*	1208.9	*37.0*	991	*189*	20152	*2016*	371	*28*	3263	*189*
35	87.0	*9.8*	1331.5	*17.5*	1470	*348*	21695	*1707*	509	*58*	3844	*357*
136	222.5	*8.7*	1755.5	*197.9*	3122	*149*	28347	*2151*	1255	*11*	5298	*49*

Table 9-405. Major cations and anions in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3274.7	*758.6*	3465.4	*1417.6*	42847	*13217*	39715	*12495*	4223	*1133*	4365	*796*
4	2459.1	*864.0*	2569.8	*8.8*	26482	*9403*	30580	*251*	3799	*1061*	5149	*122*
7	1726.3	*698.5*	1629.5	*374.2*	19420	*5598*	27319	*3892*	3439	*356*	4812	*586*
11	1290.5	*817.7*	1789.0	*265.1*	15117	*6178*	24136	*864*	3010	*778*	4159	*51*
18	1629.3	*1186.9*	1323.4	*296.7*	18406	*14608*	20784	*713*	3040	*409*	3672	*752*
25	1098.6	*363.3*	1601.9	*287.8*	11911	*4878*	23458	*2961*	2831	*350*	4712	*451*
35	894.5	*181.3*	1668.5	*270.5*	10038	*1019*	24648	*2101*	2858	*413*	5025	*25*
136	708.2	*80.8*	1913.6	*230.6*	6813	*308*	29333	*2170*	2463	*278*	5356	*157*

Table 9-406. Major cations and anions in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3970.9	*230.2*	4160.6	*588.9*	52411	*3211*	48600	*4670*	3738	*493*	4397	*468*
4	4359.5	*68.0*	4484.2	*343.7*	48101	*582*	49662	*5464*	4003	*90*	4135	*193*
7	4312.4	*533.2*	3588.6	*397.4*	49741	*6068*	50374	*6630*	3889	*317*	4153	*179*
11	4129.9	*485.4*	4539.2	*969.5*	46505	*2725*	48300	*10168*	3842	*227*	3968	*407*
18	3300.7	*318.8*	3245.8	*664.4*	38173	*3501*	39784	*8437*	3594	*24*	3591	*81*
25	2976.2	*189.1*	3276.4	*451.6*	36118	*41*	40645	*5102*	3746	*32*	4174	*477*
35	3120.8	*247.6*	3245.2	*857.6*	34002	*1187*	40290	*8481*	4373	*268*	4766	*19*
136	2160.1	*142.6*	2732.6	*702.1*	17692	*1049*	34382	*5900*	3850	*150*	5081	*194*

Table 9-407. Selected surface water properties after inundation of the Meningie soil material (Site 4): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.73	*0.14*	7.93	*<0.01*	356	*20*	323	*2*	2.1	*0.1*	3.7	*0.1*
4	7.76	*0.34*	7.60	*0.07*	250	*32*	298	*39*	1.9	*<0.1*	3.5	*<0.1*
7	7.65	*0.17*	7.68	*0.08*	220	*22*	285	*18*	2.3	*0.1*	5.3	*0.5*
11	7.59	*0.25*	7.61	*0.15*	179	*30*	220	*62*	2.5	*<0.1*	4.2	*0.3*
18	7.63	*0.03*	7.86	*0.08*	199	*56*	237	*20*	1.5	*0.1*	3.6	*0.2*
25	7.89	*0.03*	7.94	*0.23*	154	*4*	227	*33*	2.4	*0.3*	4.1	*0.5*
35	7.84	*0.08*	7.99	*0.05*	146	*4*	192	*36*	2.4	*0.3*	4.2	*0.1*
136	8.13	*0.24*	7.87	*0.21*	171	*9*	163	*7*	3.1	*0.9*	5.0	*0.8*

Table 9-408. Selected pore-water properties (3-5 cm) after inundation of the Meningie soil material (Site 4): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.20	*0.02*	7.43	*0.41*	373	*28*	258	*146*	3.1	*0.4*	4.6	*1.4*
4	7.03	*0.02*	6.86	*0.09*	215	*156*	211	*172*	5.2	*1.7*	5.9	*2.6*
7	7.02	*<0.01*	7.00	*0.10*	205	*88*	193	*117*	6.1	*1.6*	7.2	*1.2*
11	7.16	*0.04*	7.13	*0.01*	136	*34*	173	*65*	6.5	*2.2*	6.1	*1.4*
18	7.05	*0.04*	6.96	*0.23*	112	*12*	148	*44*	4.4	*2.3*	5.5	*1.8*
25	7.22	*0.02*	7.06	*0.16*	109	*4*	121	*29*	5.9	*2.0*	6.1	*1.7*
35	7.44	*0.62*	7.01	*0.05*	105	*12*	115	*1*	5.8	*2.1*	6.0	*1.7*
136	7.35	*0.35*	6.93	*0.07*	157	*60*	119	*9*	5.0	*4.5*	5.8	*1.5*

Table 9-409. Selected pore-water properties (10-12 cm) after inundation of the Meningie soil material (Site 4): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.59	*0.03*	6.95	*0.19*	393	*24*	286	*106*	4.5	*0.2*	5.4	*2.6*
4	6.54	*0.03*	6.55	*0.40*	281	*4*	262	*128*	4.5	*0.3*	5.8	*3.8*
7	6.51	*0.06*	6.59	*0.11*	273	*8*	260	*122*	4.8	*0.6*	7.5	*4.8*
11	6.74	*0.04*	6.70	*0.09*	210	*2*	215	*92*	5.2	*0.8*	7.2	*5.0*
18	6.77	*0.14*	6.61	*0.17*	162	*33*	215	*122*	3.2	*0.7*	6.3	*4.7*
25	6.73	*0.07*	6.69	*0.24*	151	*14*	191	*124*	6.5	*2.4*	7.5	*6.7*
35	6.81	*0.50*	6.65	*0.04*	116	*42*	172	*99*	6.7	*2.8*	7.2	*5.9*
136	6.84	-	6.70	*0.01*	121	-	127	*30*	10.8	-	8.4	*6.7*

Table 9-410. Selected surface water properties after inundation of the Meningie soil material (Site 4): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.33	*0.65*	<0.2	-	<0.2	-	6.1	-	2.7	-
4	0.43	*<0.2*	0.30	*0.30*	<0.2	-	<0.2	-				
7	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	0.20	*0.40*	<0.2	-	<0.2	-	5.8	-	3.9	-
18	0.55	*<0.2*	0.55	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	18.0	-	4.2	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.5	*0.1*	3.6	*0.4*

Table 9-411. Selected pore-water properties (3-5 cm) after inundation of the Meningie soil material (Site 4): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	2.85	*4.70*	0.33	*0.65*	0.43	*0.85*	21.0	-	13.0	-
4	2.65	*4.30*	3.60	*5.90*	0.80	*1.60*	1.10	*2.20*				
7	2.40	*4.80*	7.25	*14.20*	1.88	*2.65*	0.28	*0.55*				
11	3.60	*2.00*	6.28	*7.05*	1.00	*0.96*	1.47	*2.94*	20.0	-	10.0	-
18	11.40	*<0.2*	12.69	*11.13*	<0.2	-	<0.2	-				
25	8.60	*5.50*	16.22	*<0.2*	0.94	*0.41*	1.51	*0.48*				
35	13.42	*10.42*	24.02	*9.77*	2.10	*1.65*	0.76	*0.86*	61.0	-	16.0	-
136	4.28	*7.36*	33.57	*8.61*	0.36	*0.73*	1.25	*0.86*	16.5	*3.0*	11.9	*4.2*

Table 9-412. Selected pore-water properties (10-12 cm) after inundation of the Meningie soil material (Site 4): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.48	*0.65*	<0.2	-	<0.2	-	52.0	-	43.0	-
4	0.98	*0.55*	1.35	*2.70*	<0.2	-	<0.2	-				
7	0.25	*0.50*	4.93	*9.65*	2.10	*0.60*	<0.2	-				
11	3.30	*2.80*	6.80	*13.60*	<0.2	-	2.70	*5.40*	46.0	-	34.0	-
18	11.57	*7.84*	17.12	*32.54*	<0.2	-	<0.2	-				
25	30.09	*25.88*	27.15	*52.36*	1.83	*2.14*	1.46	*2.92*				
35	47.55	*30.49*	40.41	*72.97*	1.10	*2.02*	1.52	*3.04*	6.6	-	35.0	-
136	69.08	-	56.93	*67.94*	5.36	-	16.33	*15.21*	53.5	*31.0*	38.5	*13.0*

Table 9-413. Selected nutrients in the surface water after inundation of the Meningie soil material (Site 4): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.084	*0.012*	0.028	*0.036*	0.026	*0.012*	0.037	*0.006*
4	0.096	*<0.005*	0.254	*0.488*	0.005	*<0.005*	0.006	*0.008*
7	0.145	*0.050*	0.055	*0.050*	0.005	*0.010*	0.010	*<0.005*
11	0.165	*0.030*	0.060	*<0.005*	0.005	*0.010*	0.005	*0.010*
18	0.415	*0.310*	0.085	*0.050*	0.120	*0.220*	0.025	*0.010*
25	0.685	*0.150*	0.185	*0.030*	0.210	*0.400*	0.105	*0.130*
35	0.625	*0.030*	0.765	*0.070*	<0.005	-	0.220	*0.360*
136	0.595	*0.130*	0.955	*0.170*	0.010	*<0.005*	<0.005	-

Table 9-414. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.389	*0.461*	0.045	*0.070*	0.032	*<0.005*	0.045	*0.010*
4	0.240	*0.440*	0.230	*0.460*	0.035	*0.030*	0.020	*0.040*
7	0.055	*0.030*	0.360	*0.520*	0.015	*0.030*	0.035	*0.050*
11	0.055	*0.010*	0.275	*0.390*	0.005	*0.010*	0.015	*0.030*
18	0.035	*0.030*	0.080	*0.020*	0.045	*0.010*	0.055	*0.050*
25	0.230	*0.080*	0.225	*0.190*	0.050	*0.020*	0.085	*0.070*
35	0.170	*0.040*	0.605	*0.610*	0.065	*0.030*	0.150	*<0.005*
136	0.195	*0.310*	0.180	*0.100*	0.035	*0.030*	0.025	*0.010*

Table 9-415. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.170	*0.140*	0.375	*0.651*	0.035	*0.010*	0.036	*0.009*
4	0.063	*0.125*	0.145	*0.270*	<0.005	-	0.025	*0.030*
7	0.050	*0.040*	0.160	*0.200*	0.005	*0.010*	0.030	*0.020*
11	0.105	*0.090*	0.045	*0.010*	<0.005	-	0.020	*0.040*
18	0.145	*0.210*	0.160	*0.180*	0.045	*0.030*	0.070	*0.060*
25	0.260	*0.160*	0.095	*0.150*	0.095	*0.090*	0.105	*0.190*
35	0.225	*0.030*	0.140	*0.040*	0.120	*0.060*	0.070	*0.120*
136	<0.005	-	0.175	*0.030*	0.240	-	0.065	*0.010*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-416. Selected nutrients in the surface water after inundation of the Meningie soil material (Site 4): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.010	*<0.005*	0.020	*<0.005*	0.220	*<0.005*	0.020	*<0.005*
4	0.060	*0.020*	0.065	*0.010*	0.075	*0.010*	0.065	*0.030*
7	0.020	*<0.005*	0.015	*0.030*	0.620	*0.140*	0.125	*0.110*
11	0.020	*0.020*	0.025	*0.010*	0.330	*0.120*	0.660	*0.740*
18	0.025	*0.010*	0.025	*0.010*	1.000	*1.780*	0.440	*0.280*
25	0.025	*0.030*	0.025	*0.010*	0.075	*0.010*	0.770	*0.280*
35	0.025	*0.010*	0.020	*0.020*	0.065	*0.010*	0.335	*0.010*
136	0.015	*0.010*	0.180	*0.100*	0.305	*0.010*	0.050	*<0.005*

Table 9-417. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.030	*0.040*	0.020	*<0.005*	0.200	*<0.005*	0.380	*0.760*
4	0.095	*0.030*	0.085	*0.030*	0.845	*1.150*	0.920	*1.360*
7	0.025	*0.030*	0.040	*0.040*	1.725	*1.270*	0.820	*1.280*
11	0.005	*0.010*	0.040	*0.040*	2.015	*2.010*	1.410	*1.260*
18	0.020	*0.020*	0.050	*0.060*	**2.615**	*2.770*	**2.000**	*1.360*
25	0.055	*0.050*	0.090	*0.100*	1.875	*1.270*	**2.350**	*1.180*
35	0.110	*0.100*	0.135	*0.090*	1.745	*1.190*	**1.980**	*0.780*
136	0.040	*0.060*	0.055	*0.010*	1.760	*2.860*	1.325	*0.770*

Table 9-418. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.055	*0.030*	0.045	*0.030*	1.060	*0.220*	1.155	*1.770*
4	0.085	*0.010*	0.105	*0.010*	1.030	*0.140*	1.605	*2.510*
7	0.025	*0.010*	0.055	*0.010*	1.740	*0.520*	**2.095**	*3.210*
11	0.020	*0.020*	0.055	*0.010*	1.770	*0.780*	**2.770**	*3.980*
18	0.020	*<0.005*	0.075	*0.010*	2.275	*1.230*	**3.070**	*3.880*
25	0.090	*0.100*	0.140	*0.140*	**2.805**	*1.810*	**4.065**	*4.990*
35	0.110	*0.020*	0.065	*0.090*	**3.055**	*1.950*	**3.930**	*4.460*
136	0.260	-	0.085	*0.050*	**5.340**	-	**4.420**	*3.900*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-419. Selected metals in the surface water after inundation of the Meningie soil material (Site 4): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.01	*<0.01*	<0.01	-	0.04	*0.02*	0.03	*0.02*	<0.01	-	0.01	*<0.01*
4	0.02	*<0.01*	0.01	*<0.01*	0.06	*<0.01*	0.08	*0.01*	0.01	*<0.01*	0.04	*0.07*
7	<0.01	-	0.05	*0.06*	0.07	*<0.01*	0.09	*0.03*	0.07	*0.10*	0.02	*0.03*
11	<0.01	-	0.05	*0.07*	0.06	*0.03*	0.03	*0.01*	0.08	*0.13*	0.01	*0.02*
18	<0.01	-	0.01	*<0.01*	0.12	*0.04*	0.10	*0.01*	0.14	*0.27*	0.01	*0.02*
25	0.05	*0.04*	<0.01	-	0.11	*0.05*	0.05	*<0.01*	0.13	*0.24*	<0.01	-
35	0.02	*0.01*	<0.01	-	0.04	*0.05*	0.05	*0.02*	0.07	*0.11*	<0.01	-
136	0.02	*<0.01*	<0.01	-	0.08	*0.04*	0.15	*<0.01*	0.03	*0.04*	<0.01	-

Table 9-420. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.13	*0.08*	0.04	*0.06*	0.16	*0.08*	3.32	*6.49*	0.01	*0.02*	1.15	*1.69*
4	0.09	*0.15*	0.05	*0.08*	2.71	*4.93*	7.69	*14.95*	1.14	*1.61*	2.45	*1.44*
7	0.05	*0.09*	0.07	*0.02*	3.09	*5.58*	6.72	*11.83*	2.76	*1.01*	3.00	*0.39*
11	0.05	*0.08*	0.44	*0.75*	4.22	*2.24*	7.48	*9.23*	**4.05**	*2.91*	4.35	*0.82*
18	0.04	*0.08*	0.07	*0.13*	9.35	*1.09*	10.63	*9.58*	**4.11**	*3.01*	5.63	*5.89*
25	0.05	*0.06*	0.04	*0.02*	8.16	*5.05*	16.36	*1.90*	**3.97**	*4.72*	5.89	*6.14*
35	0.03	*0.05*	0.03	*0.04*	13.68	*11.26*	21.46	*10.14*	**4.62**	*5.24*	4.84	*3.41*
136	0.06	*0.09*	0.03	*0.04*	4.35	*8.35*	33.17	*5.87*	1.41	*2.79*	2.64	*2.43*

Table 9-421. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.02*	0.04	*<0.01*	0.24	*0.06*	0.49	*0.90*	**4.34**	*3.93*	6.12	*9.56*
4	0.02	*<0.01*	0.01	*<0.01*	0.50	*0.43*	1.20	*2.25*	**6.69**	*2.10*	8.69	*14.26*
7	<0.01	-	0.03	*0.02*	1.43	*0.15*	4.60	*9.00*	**7.33**	*2.00*	13.37	*22.80*
11	<0.01	-	<0.01	-	3.69	*3.64*	8.63	*17.11*	**11.21**	*4.49*	15.18	*25.43*
18	<0.01	-	0.01	*<0.01*	12.70	*9.79*	18.06	*35.01*	**13.25**	*3.28*	18.94	*32.24*
25	0.01	*<0.01*	<0.01	-	25.38	*21.70*	31.38	*60.63*	**10.28**	*0.55*	19.67	*30.10*
35	0.02	*0.02*	<0.01	-	39.32	*23.00*	35.79	*64.89*	**11.86**	*0.70*	17.23	*21.71*
136	0.03	-	0.03	*0.02*	72.42	-	69.11	*53.03*	**12.00**	-	17.24	*9.46*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-422. Selected metalloids and metals in the surface water after inundation of the Meningie soil material (Site 4): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	<1.0	-	<15.0	-	2.42	*0.31*	<1.0	-	1.62	*0.42*	<5.0	-
4	0.83	*0.28*	<15.0	-	1.73	*0.04*	<1.0	-	1.59	*0.06*	<5.0	-
7	0.49	*0.14*	<15.0	-	3.25	*0.99*	3.25	*0.14*	2.25	*0.03*	<5.0	-
11	1.15	*0.79*	<15.0	-	2.70	*0.22*	2.26	*0.51*	2.01	*0.05*	<5.0	-
18	0.98	*1.18*	<15.0	-	3.44	*0.92*	1.21	*0.79*	1.46	*0.28*	<5.0	-
25	0.88	*1.76*	29.85	*2.90*	3.00	*0.38*	2.19	*0.56*	2.57	*1.11*	<5.0	-
35	2.18	*0.87*	<15.0	-	2.37	*0.05*	2.04	*0.01*	1.67	*0.25*	<5.0	-
136	3.47	*4.96*	37.95	*9.00*	1.50	*0.64*	<1.0	-	3.30	*2.51*	<5.0	-

Table 9-423. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	2.25	*4.50*	19.60	*17.70*	5.67	*0.03*	1.17	*2.34*	30.90	*17.05*	26.56	*10.50*
4	11.16	*15.21*	24.65	*38.92*	3.55	*3.35*	1.44	*2.48*	24.31	*22.28*	19.08	*0.08*
7	14.78	*14.38*	16.47	*29.91*	2.93	*3.12*	4.12	*3.26*	23.43	*19.24*	18.91	*10.60*
11	18.71	*7.29*	15.57	*24.34*	2.51	*1.62*	3.01	*3.03*	17.79	*9.56*	22.89	*7.51*
18	23.86	*0.16*	35.72	*32.06*	2.30	*0.72*	2.24	*3.15*	16.81	*13.20*	19.30	*7.00*
25	20.48	*6.03*	59.62	*33.78*	1.73	*0.54*	2.50	*2.68*	12.64	*4.92*	17.69	*7.91*
35	33.22	*6.36*	31.21	*11.40*	2.14	*0.42*	1.32	*0.49*	9.20	*1.04*	11.52	*9.32*
136	19.94	*35.34*	67.94	*6.63*	1.69	*0.19*	**8.74**	*0.25*	5.58	*7.58*	8.71	*7.37*

Table 9-424. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	<15.0	-	<15.0	-	12.24	*6.46*	**10.28**	*3.30*	48.22	*6.78*	42.28	*13.47*
4	<15.0	-	<15.0	-	12.76	*0.93*	**9.64**	*1.76*	45.59	*12.59*	38.70	*15.24*
7	<15.0	-	<15.0	-	7.23	*0.88*	**12.67**	*5.97*	49.19	*16.78*	55.68	*25.55*
11	<15.0	-	21.01	*11.95*	10.40	*6.93*	**12.46**	*7.60*	59.94	*10.83*	64.34	*20.89*
18	29.95	*11.13*	54.06	*53.68*	9.52	*4.35*	**11.99**	*3.88*	64.35	*13.06*	66.37	*55.40*
25	<15.0	-	82.28	*71.59*	5.00	*0.06*	**9.44**	*0.80*	52.69	*4.13*	60.86	*47.00*
35	32.00	*5.81*	36.52	*36.69*	2.85	*1.46*	**14.40**	*21.70*	37.50	*7.07*	38.01	*31.42*
136	66.70	-	79.77	*48.13*	<1.0	-	**10.26**	*1.06*	27.03	-	30.49	*13.10*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-425. Selected metals in the surface water after inundation of the Meningie soil material (Site 4): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	17.37	*1.10*	13.64	*3.28*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	29.34	*27.72*	25.61	*1.12*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
7	43.15	*38.61*	31.13	*0.98*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
11	42.20	*38.64*	15.48	*2.11*	0.11	*<0.1*	0.16	*<0.1*	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
25	5.92	*3.95*	11.40	*1.68*	<0.1	-	0.12	*<0.1*	<1.0	-	<1.0	-
35	56.14	*13.05*	**51.89**	*3.73*	<0.1	-	0.16	*<0.1*	<1.0	-	<1.0	-
136	6.99	-	<5.0	-	<0.1	-	0.16	*0.16*	<1.0	-	<1.0	-

Table 9-426. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	37.28	*7.73*	31.40	*3.41*	0.24	*0.21*	0.21	*<0.1*	1.15	*2.30*	7.00	*11.88*
4	107.75	*27.16*	37.79	*39.92*	0.17	*0.34*	0.20	*<0.1*	7.20	*13.40*	5.68	*6.47*
7	48.96	*5.97*	37.38	*18.33*	0.15	*0.14*	0.11	*0.20*	8.39	*6.50*	6.29	*0.15*
11	64.37	*22.83*	**46.16**	*37.26*	0.21	*0.21*	0.21	*0.17*	8.66	*0.94*	14.65	*2.06*
18	n.a.	-	n.a.	-	0.15	*0.14*	0.26	*0.19*	8.52	*0.97*	17.16	*22.10*
25	14.74	*9.08*	30.35	*8.36*	0.12	*0.18*	0.11	*<0.1*	6.57	*5.87*	21.10	*31.74*
35	45.34	*9.60*	**60.17**	*51.16*	<0.1	-	0.26	*0.10*	6.24	*5.47*	20.05	*31.50*
136	11.23	-	14.25	*6.86*	<0.1	-	0.12	*<0.1*	<1.0	-	8.91	*0.31*

Table 9-427. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	62.38	*20.11*	**56.61**	*20.22*	0.59	*0.24*	0.63	*0.35*	12.85	*11.43*	23.91	*35.76*
4	74.05	-	**82.61**	*28.29*	0.33	*0.15*	0.46	*<0.1*	19.47	*5.49*	30.96	*51.25*
7	52.54	*1.40*	**83.61**	-	0.45	*0.26*	0.50	*<0.1*	30.34	*5.15*	54.11	*91.40*
11	102.84	*9.73*	**69.25**	*16.49*	0.30	*<0.1*	0.41	*0.22*	53.94	*18.74*	73.20	*126.73*
18	n.a.	-	n.a.	-	0.27	*<0.1*	0.32	*0.21*	77.44	*25.60*	115.36	*206.04*
25	35.63	*1.67*	**61.37**	*18.50*	<0.1	-	0.24	*0.22*	67.25	*3.68*	106.33	*180.43*
35	83.58	*28.97*	**105.67**	*7.93*	<0.1	-	0.28	*0.14*	66.64	*7.89*	81.64	*123.56*
136	17.88	-	23.59	*13.47*	0.1	-	0.12	*<0.1*	34.81	-	62.21	*18.95*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-428. Selected metals in the surface water after inundation of the Meningie soil material (Site 4): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	2.61	*0.24*	<4.4	-	<1.0	-	<1.0	-
4	2.80	*0.38*	<4.4	-	<1.0	-	<1.0	-
7	3.84	*0.43*	<4.4	-	<1.0	-	<1.0	-
11	4.15	*0.20*	<4.4	-	1.01	*2.02*	<1.0	-
18	4.91	*0.61*	<4.4	-	<1.0	-	<1.0	-
25	4.45	*0.60*	<4.4	-	<1.0	-	<1.0	-
35	3.31	*0.70*	<4.4	-	<1.0	-	<1.0	-
136	3.13	*0.28*	<4.4	-	<1.0	-	<1.0	-

Table 9-429. Selected metals in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<1.0	-	<4.4	-	1.76	*3.46*	1.71	*3.42*
4	1.61	*0.41*	<4.4	-	3.62	*7.23*	2.36	*4.56*
7	2.89	*1.22*	<4.4	-	4.18	*7.84*	2.01	*2.09*
11	3.34	*1.32*	<4.4	-	2.43	*4.75*	1.64	*3.15*
18	3.52	*1.42*	<4.4	-	3.77	*6.89*	4.25	*7.23*
25	4.19	*1.83*	<4.4	-	1.71	*3.00*	1.79	*3.32*
35	2.66	*0.10*	<4.4	-	1.40	*2.79*	1.57	*2.97*
136	5.90	*8.57*	<4.4	-	1.70	*2.77*	1.85	*2.09*

Table 9-430. Selected metals in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<4.4	-	<4.4	-	<1.0	-	<1.0	-
4	<4.4	-	<4.4	-	1.08	*<1.0*	<1.0	-
7	<4.4	-	<4.4	-	<1.0	-	<1.0	-
11	<4.4	-	<4.4	-	<1.0	-	<1.0	-
18	4.42	*0.23*	<4.4	-	<1.0	-	1.09	*<1.0*
25	4.59	*2.25*	<4.4	-	<1.0	-	<1.0	-
35	<4.4	-	<4.4	-	<1.0	-	<1.0	-
136	<4.4	-	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-431. Major cations in the surface water after inundation of the Meningie soil material (Site 4): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	137	*19*	10184	*129*	4.7	*0.3*	343.8	*2.8*	22.3	*1.0*	397.4	*6.3*
4	142	*12*	10220	*90*	5.8	*0.2*	368.5	*13.2*	27.2	*1.6*	443.4	*6.2*
7	148	*18*	10470	-	6.8	*0.3*	363.4	-	30.3	*0.9*	450.8	-
11	169	*33*	10929	*38*	6.9	*0.4*	358.6	*1.2*	30.4	*1.7*	434.2	*12.7*
18	240	*18*	10484	*95*	9.1	*1.0*	379.9	*2.0*	40.1	*2.9*	433.9	*7.9*
25	259	*102*	10365	*206*	9.1	*1.4*	410.4	*14.1*	40.4	*15.9*	496.9	*43.2*
35	303	*69*	10572	*46*	9.7	*0.2*	414.7	*3.8*	49.2	*14.1*	489.6	*31.0*
136	673	*677*	14899	*796*	18.1	*9.6*	506.2	*21.6*	78.9	*87.8*	631.1	*42.7*

Table 9-432. Major cations in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	4603	*1926*	9415	*1185*	82.8	*25.9*	216.3	*3.3*	904.7	*297.6*	944.2	*331.0*
4	2907	*1109*	10282	*631*	57.1	*12.7*	288.2	*25.6*	626.7	*361.4*	911.5	*68.1*
7	2168	*734*	10207	*30*	44.6	*2.9*	295.6	*6.2*	521.9	*350.0*	829.0	*30.2*
11	1617	*319*	11173	*709*	34.0	*1.3*	316.8	*6.5*	370.8	*247.7*	812.5	*41.0*
18	1845	*1055*	10843	*174*	35.0	*8.5*	341.5	*0.4*	373.3	*387.4*	815.6	*44.9*
25	1462	*279*	10182	*461*	27.8	*3.0*	354.4	*30.8*	265.5	*209.4*	797.0	*129.1*
35	1603	*259*	10708	*446*	28.0	*3.1*	372.7	*12.5*	263.3	*166.1*	778.3	*129.1*
136	1308	*1987*	14279	*597*	22.7	*19.1*	478.6	*13.5*	159.4	*247.8*	708.4	*183.1*

Table 9-433. Major cations in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	13156	*3883*	14105	*660*	143.5	*22.3*	142.3	*5.9*	1504.4	*321.6*	1575.0	*170.1*
4	11489	*4002*	13346	*162*	152.8	*37.7*	151.1	*17.6*	1616.1	*494.8*	1672.5	*93.0*
7	11739	*4949*	12974	*302*	145.6	*3.3*	161.6	*5.9*	1566.7	*207.0*	1594.4	*187.6*
11	10099	*1871*	12770	*877*	132.9	*0.3*	182.4	*2.3*	1405.7	*146.3*	1550.3	*317.8*
18	5708	*3606*	10029	*1942*	82.1	*27.6*	172.1	*42.8*	851.2	*558.4*	1231.4	*217.4*
25	8373	*2015*	11668	*975*	105.1	*0.9*	202.2	*24.5*	1250.1	*451.5*	1391.8	*38.9*
35	7819	*2100*	12538	*98*	99.6	*10.8*	242.8	*8.4*	1127.9	*447.6*	1499.3	*184.7*
136	5163	-	13269	*257*	58.0	-	354.4	*23.2*	777.5	-	1096.4	*384.3*

Table 9-434. Major cations and anions in the surface water after inundation of the Meningie soil material (Site 4): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	18.8	*1.7*	1277.9	*7.3*	469	*122*	21349	*476*	115	*10*	3025	*100*
4	21.7	*1.0*	1274.1	*13.8*	450	*46*	21014	*629*	76	*5*	3187	*43*
7	18.0	*2.0*	1419.5	-	506	*99*	22446	-	117	*7*	2789	-
11	18.3	*5.1*	1496.4	*70.6*	538	*163*	22736	*230*	94	*15*	2930	*75*
18	30.9	*0.6*	1335.9	*25.5*	579	*109*	20421	*251*	104	*14*	2939	*17*
25	32.6	*13.4*	1302.6	*115.1*	539	*164*	21945	*412*	97	*24*	2900	*83*
35	37.1	*6.8*	1267.4	*1.4*	681	*159*	22536	*180*	94	*15*	3290	*38*
136	87.0	*85.9*	1701.8	*82.9*	1071	*1121*	26569	*749*	161	*57*	4009	*42*

Table 9-435. Major cations and anions in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	812.7	*474.0*	1409.0	*325.2*	10994	*4642*	20734	*3330*	2002	*1316*	3367	*725*
4	539.2	*310.3*	1475.7	*61.7*	6588	*2565*	21493	*382*	1219	*1153*	3747	*100*
7	348.4	*197.7*	1430.9	*99.2*	5285	*1734*	23318	*176*	1196	*1254*	3373	*21*
11	225.8	*84.0*	1607.2	*90.7*	3862	*584*	23361	*299*	713	*690*	3362	*196*
18	332.4	*280.5*	1421.9	*23.2*	3984	*2203*	20946	*399*	706	*955*	3410	*156*
25	229.8	*83.1*	1333.6	*72.1*	2884	*467*	21891	*23*	490	*574*	3141	*376*
35	289.2	*69.4*	1324.9	*9.7*	3531	*660*	23025	*1186*	399	*354*	3463	*190*
136	297.2	*511.5*	1722.0	*155.3*	2422	*3743*	26175	*503*	299	*421*	3819	*253*

Table 9-436. Major cations and anions in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3810.1	*1035.7*	3928.6	*388.6*	33821	*9385*	36975	*2112*	3757	*1130*	3992	*554*
4	3489.9	*1070.8*	3766.2	*28.7*	33074	*10436*	35023	*1020*	3448	*930*	4105	*447*
7	3537.4	*1408.5*	2916.5	*66.8*	29086	*12703*	31622	*1167*	3657	*1850*	4161	*667*
11	2780.6	*317.5*	3355.5	*240.2*	23360	*4019*	28480	*1034*	3077	*853*	3540	*1094*
18	1471.7	*946.0*	2274.1	*635.3*	14866	*9112*	22746	*4357*	2026	*1490*	2868	*510*
25	2295.1	*532.6*	2452.7	*319.9*	18985	*5680*	26393	*2651*	2979	*1353*	3400	*182*
35	2240.3	*696.3*	2807.4	*55.2*	18508	*5611*	27938	*92*	2991	*1696*	4261	*887*
136	1992.9	-	2321.5	*338.1*	12440	-	26828	*118*	2246	-	3980	*693*

Table 9-437. Selected surface water properties after inundation of the Tolderol soil material (Site 5): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	7.69	0.20	7.93	0.26	379	22	302	33	2.1	0.2	3.7	<0.1
4	7.40	0.07	7.41	0.15	283	39	293	49	2.3	0.6	3.0	0.1
7	7.42	0.12	7.55	0.09	266	7	285	43	2.3	<0.1	4.6	0.4
11	7.54	0.16	7.59	0.11	259	96	205	72	2.4	0.1	3.4	0.6
18	7.19	0.51	7.70	0.50	286	62	254	0	1.4	0.1	2.9	0.2
25	7.67	0.34	7.94	0.26	209	75	217	47	2.1	0.1	3.2	0.3
35	7.51	0.18	7.90	0.24	217	142	205	68	2.1	0.3	3.4	0.1
136	7.81	0.23	7.80	0.13	201	1	154	35	2.5	0.3	3.4	0.1

Table 9-438. Selected pore-water properties (3-5 cm) after inundation of the Tolderol soil material (Site 5): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	7.39	0.07	7.58	0.53	404	3	327	5	1.5	0.5	2.0	1.7
4	7.34	0.01	6.83	0.01	306	13	321	38	1.9	0.8	2.7	0.8
7	7.22	0.18	7.03	0.05	280	36	273	115	2.5	0.6	4.8	0.7
11	7.36	0.10	7.42	0.24	259	8	212	84	2.8	0.3	3.8	0.2
18	7.22	0.36	7.11	0.32	187	123	204	103	1.8	0.2	3.2	0.2
25	7.40	0.01	7.42	0.58	152	79	195	122	2.0	0.5	3.5	0.8
35	7.60	0.39	7.21	0.49	144	4	188	113	2.6	0.6	3.6	0.1
136	7.13	0.03	7.38	0.21	157	15	144	31	3.1	-	3.5	0.3

Table 9-439. Selected pore-water properties (10-12 cm) after inundation of the Tolderol soil material (Site 5): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.98	0.25	7.45	0.09	422	12	372	32	1.0	0.5	1.1	-
4	7.12	0.10	6.07	0.48	320	16	347	15	0.7	0.1	1.5	0.5
7	7.04	0.13	6.69	0.06	308	20	335	41	1.2	0.3	3.8	0.3
11	7.13	0.17	7.15	0.03	312	39	261	31	1.3	0.7	2.9	0.3
18	6.57	0.47	6.94	0.24	314	50	258	65	0.8	0.5	2.6	0.3
25	7.10	0.36	6.86	0.56	225	98	327	143	1.5	1.1	2.8	0.5
35	7.07	0.27	6.92	0.39	146	38	255	1	1.7	1.0	3.1	0.4
136	6.86	0.27	7.08	0.14	178	53	151	19	2.7	0.9	3.6	0.2

Table 9-440. Selected surface water properties after inundation of the Tolderol soil material (Site 5): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.3	-	3.2	-
4	0.55	*<0.2*	<0.2	-	<0.2	-	<0.2	-				
7	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
11	0.78	*1.55*	<0.2	-	<0.2	-	<0.2	-	6.2	-	4.7	-
18	0.56	*<0.2*	0.54	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	0.22	*0.44*	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	10.0	-	6.4	-
136	<0.2	-	<0.2	-	0.66	*0.70*	<0.2	-	7.3	*0.4*	2.9	*0.8*

Table 9-441. Selected pore-water properties (3-5 cm) after inundation of the Tolderol soil material (Site 5): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	<0.2	-	0.21	*0.28*	<0.2	-	11.0	-	6.3	-
4	0.50	*0.20*	<0.2	-	<0.2	-	<0.2	-				
7	<0.2	-	0.73	*1.45*	<0.2	-	0.45	*0.90*				
11	1.68	*<0.2*	0.78	*1.55*	<0.2	-	0.66	*1.33*	8.3	-	7.5	-
18	1.89	*2.71*	5.70	*10.33*	0.46	*0.84*	<0.2	-				
25	1.54	*1.78*	4.70	*9.37*	0.67	*<0.2*	0.37	*0.64*				
35	3.11	*1.30*	6.04	*11.92*	0.59	*<0.2*	<0.2	-	9.0	-	6.1	-
136	4.46	*0.72*	1.05	*<0.2*	1.03	*<0.2*	0.23	*0.44*	9.1	*1.0*	3.9	*1.1*

Table 9-442. Selected pore-water properties (10-12 cm) after inundation of the Tolderol soil material (Site 5): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	<0.2	-	0.25	*<0.2*	<0.2	-	8.8	-	13.0	-
4	0.35	*0.20*	<0.2	-	<0.2	-	<0.2	-				
7	<0.2	-	<0.2	-	<0.2	-	0.40	*0.20*				
11	0.73	*1.45*	0.30	*0.60*	<0.2	-	<0.2	-	8.4	-	6.0	-
18	0.56	*<0.2*	0.98	*0.83*	<0.2	-	<0.2	-				
25	<0.2	-	0.47	*0.93*	<0.2	-	<0.2	-				
35	0.50	*1.01*	0.38	*0.75*	<0.2	-	<0.2	-	6.7	-	5.5	-
136	3.85	*2.39*	4.03	*0.50*	1.14	*0.62*	0.31	*0.44*	10.2	*1.6*	4.1	*1.2*

Table 9-443. Selected nutrients in the surface water after inundation of the Tolderol soil material (Site 5): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.080	*0.020*	0.105	*0.050*	0.030	*<0.005*	0.040	*<0.005*
4	0.140	*0.080*	1.665	*0.130*	0.005	*0.010*	0.020	*0.040*
7	0.235	*0.050*	1.710	*0.080*	0.005	*0.010*	0.015	*0.010*
11	0.270	*0.080*	1.780	*0.380*	<0.005	-	0.015	*0.030*
18	0.425	*0.230*	1.415	*1.270*	0.005	*0.010*	0.050	*0.020*
25	0.485	*0.270*	1.235	*1.610*	<0.005	-	0.080	*0.080*
35	0.480	*0.320*	1.185	*1.390*	0.005	*0.010*	0.125	*0.150*
136	0.640	*0.140*	1.735	*1.830*	0.010	*<0.005*	<0.005	-

Table 9-444. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	4.630	*0.800*	4.660	*5.840*	0.060	*0.060*	0.130	*<0.005*
4	2.765	*0.530*	1.900	*1.780*	0.005	*0.010*	0.060	*<0.005*
7	1.280	*0.760*	0.895	*0.710*	0.015	*0.010*	0.060	*0.120*
11	2.205	*3.610*	0.775	*0.230*	0.030	*0.040*	0.020	*<0.005*
18	0.540	*1.040*	0.610	*0.420*	0.050	*0.080*	0.080	*0.020*
25	2.685	*4.990*	0.610	*0.240*	0.045	*0.070*	0.050	*0.040*
35	0.170	*0.200*	0.400	*0.140*	0.025	*0.030*	0.005	*0.010*
136	0.010	*<0.005*	0.640	*1.020*	0.040	*<0.005*	0.010	*0.020*

Table 9-445. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	13.605	*0.650*	16.520	*0.020*	0.030	*<0.005*	0.045	*0.010*
4	12.000	*2.860*	2.435	*0.430*	0.015	*0.010*	0.020	*0.040*
7	9.665	*1.870*	2.425	*0.130*	0.015	*0.030*	0.060	*0.100*
11	14.465	*11.310*	2.365	*0.470*	0.010	*0.020*	0.010	*0.020*
18	9.450	*13.940*	1.420	*0.740*	0.190	*0.240*	0.045	*0.030*
25	6.855	*11.830*	1.130	*0.600*	0.240	*0.420*	0.050	*0.040*
35	5.495	*9.950*	1.035	*0.570*	0.200	*0.240*	0.050	*0.040*
136	0.055	*0.050*	0.180	*0.040*	0.035	*0.030*	0.020	*<0.005*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-446. Selected nutrients in the surface water after inundation of the Tolderol soil material (Site 5): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.006	*0.008*	0.015	*0.030*	0.190	*0.040*	0.055	*0.030*
4	0.070	*<0.005*	0.085	*0.030*	0.050	*<0.005*	0.145	*0.090*
7	0.030	*<0.005*	0.045	*0.030*	0.455	*0.030*	0.250	*0.100*
11	0.040	*<0.005*	0.050	*0.020*	0.110	*<0.005*	0.460	*0.060*
18	0.035	*0.010*	0.045	*0.010*	0.530	*0.500*	0.280	*0.100*
25	0.035	*0.010*	0.030	*0.020*	0.080	*<0.005*	0.495	*0.110*
35	0.040	*0.020*	0.020	*0.020*	0.065	*0.010*	0.120	*<0.005*
136	0.050	*<0.005*	0.025	*0.010*	0.285	*0.010*	0.055	*0.010*

Table 9-447. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.125	*0.170*	0.045	*0.010*	0.205	*0.030*	0.470	*0.460*
4	0.155	*0.090*	0.160	*0.100*	0.070	*0.060*	0.765	*1.290*
7	0.075	*0.070*	0.110	*0.120*	0.550	*0.180*	1.495	*2.090*
11	0.060	*0.080*	0.085	*0.130*	0.345	*0.170*	1.220	*0.720*
18	0.025	*0.010*	0.095	*0.070*	1.370	*1.640*	0.720	*0.760*
25	0.015	*0.010*	0.090	*0.040*	0.320	*<0.005*	0.680	*0.380*
35	0.020	*0.020*	0.055	*0.050*	0.450	*0.320*	0.465	*0.090*
136	0.040	*0.020*	0.060	*0.020*	0.600	*0.200*	0.215	*0.030*

Table 9-448. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.015	*0.010*	0.025	*0.010*	0.175	*0.010*	0.110	*0.200*
4	0.060	*0.020*	0.080	*0.020*	0.045	*0.010*	0.310	*0.220*
7	0.015	*0.010*	0.015	*0.010*	0.415	*0.010*	0.305	*0.010*
11	0.020	*<0.005*	0.020	*<0.005*	0.125	*0.090*	0.480	*0.040*
18	0.010	*0.020*	0.025	*0.030*	0.700	*0.300*	0.460	*0.120*
25	0.015	*0.010*	0.025	*0.050*	0.175	*0.170*	0.550	*0.060*
35	0.010	*0.020*	0.025	*0.050*	0.215	*0.150*	0.440	*0.100*
136	0.010	*0.020*	0.025	*0.010*	0.865	*0.290*	0.515	*0.130*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-449. Selected metals in the surface water after inundation of the Tolderol soil material (Site 5): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.07	0.07	<0.01	-	0.05	0.04	0.04	0.03	<0.01	-	<0.01	-
4	0.02	<0.01	0.01	<0.01	0.05	<0.01	0.10	0.03	<0.01	-	0.39	0.16
7	<0.01	-	0.04	0.03	0.06	<0.01	0.11	0.01	<0.01	-	0.38	0.18
11	<0.01	-	0.16	0.20	0.06	0.02	0.08	0.07	<0.01	-	0.27	0.12
18	<0.01	-	0.02	0.02	0.12	0.07	0.25	0.22	<0.01	-	0.11	<0.01
25	0.02	<0.01	<0.01	-	0.05	0.07	0.11	0.11	<0.01	-	0.07	0.07
35	0.01	<0.01	<0.01	-	0.02	0.01	0.05	0.03	<0.01	-	0.03	0.05
136	0.03	<0.01	0.01	<0.01	0.07	<0.01	0.16	0.06	<0.01	-	<0.01	-

Table 9-450. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.08	0.07	0.02	0.01	0.07	0.04	0.02	0.04	<0.01	-	<0.01	-
4	0.03	<0.01	0.01	<0.01	0.04	0.01	0.09	0.08	0.03	0.03	0.70	0.36
7	<0.01	-	0.03	0.02	0.10	<0.01	0.66	1.19	0.16	0.13	0.74	0.56
11	0.01	<0.01	0.06	0.09	0.16	0.10	1.40	2.74	0.19	0.31	0.68	0.19
18	<0.01	-	<0.01	-	1.71	3.23	4.62	9.03	0.32	0.31	0.46	0.71
25	0.01	<0.01	<0.01	-	1.51	1.99	5.15	10.21	0.44	0.59	0.64	1.16
35	0.01	<0.01	<0.01	-	3.15	1.36	5.27	10.38	0.39	0.63	0.98	0.72
136	0.01	<0.01	<0.01	-	5.24	1.21	1.44	0.11	0.61	0.67	0.28	0.43

Table 9-451. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	0.02	0.03	<0.01	0.06	0.04	0.01	<0.01	0.01	0.01	2.42	2.01
4	0.03	<0.01	0.03	0.03	0.03	0.02	0.04	0.05	0.02	0.02	0.90	0.72
7	0.01	0.01	0.05	0.03	0.09	<0.01	0.07	0.02	0.01	0.02	0.44	0.03
11	0.01	<0.01	0.14	0.17	0.17	0.19	0.05	0.05	0.97	1.89	0.36	0.41
18	0.01	0.02	0.01	0.01	0.11	0.03	0.45	0.68	0.68	1.19	0.50	0.28
25	0.02	0.03	<0.01	-	0.23	0.39	0.47	0.82	0.84	0.97	0.69	1.04
35	0.01	<0.01	0.01	<0.01	0.46	0.88	0.31	0.50	1.01	1.07	0.74	0.51
136	0.01	<0.01	<0.01	-	4.50	3.13	4.22	0.06	2.20	1.04	1.62	0.53

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-452. Selected metalloids and metals in the surface water after inundation of the Tolderol soil material (Site 5): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	<1.0	-	16.38	*0.07*	1.58	*0.18*	<1.0	-	1.68	*0.51*	<5.0	-
4	<1.0	-	<15.0	-	1.16	*0.40*	1.26	*1.24*	1.29	*0.04*	23.35	*6.96*
7	<1.0	-	<15.0	-	2.39	-	3.71	*0.16*	2.29	*0.44*	32.99	*6.04*
11	<1.0	-	<15.0	-	2.04	*1.05*	2.27	*0.54*	1.92	*0.06*	30.67	*7.27*
18	1.09	*0.53*	<15.0	-	2.54	*1.17*	1.30	*1.45*	1.33	*0.65*	20.62	*16.09*
25	<1.0	-	36.54	*2.22*	2.53	*0.27*	1.27	*1.29*	2.55	*0.83*	25.23	*36.30*
35	1.24	*0.59*	<15.0	-	3.51	*1.86*	1.84	*0.60*	1.41	*0.54*	15.66	*30.31*
136	1.85	*1.04*	28.93	*3.84*	1.49	*0.43*	2.81	*0.14*	1.86	*0.38*	8.53	*13.37*

Table 9-453. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	2.10	*1.79*	<15.0		6.76	*5.35*	2.64	*0.15*	4.97	*2.13*	14.82	*1.07*
4	1.64	*0.86*	<15.0	-	3.54	*0.20*	1.34	*1.39*	6.60	*0.96*	116.41	*149.19*
7	2.05	*2.01*	<15.0	-	4.04	*0.01*	4.66	*1.27*	8.10	*0.88*	59.94	*30.27*
11	3.09	*2.95*	<15.0	-	5.05	*4.35*	2.94	*1.28*	7.86	*1.05*	39.30	*5.89*
18	3.94	*4.48*	<15.0	-	6.11	*10.17*	1.26	*0.12*	7.92	*3.02*	20.97	*15.69*
25	2.50	*2.23*	32.89	*5.45*	2.39	*1.51*	1.98	*1.52*	5.72	-	22.19	*26.19*
35	5.54	*0.65*	<15.0	-	2.08	*0.91*	1.35	*0.88*	6.76	*7.16*	18.04	*22.75*
136	9.10	*0.42*	34.90	*7.41*	<1.0	-	2.44	*0.76*	4.88	*2.29*	10.30	*7.33*

Table 9-454. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.12	*1.82*	<15.0	-	2.74	*0.34*	1.43	*0.46*	22.59	*18.19*	250.95	*161.20*
4	<1.0	-	<15.0	-	2.34	*0.59*	<1.0	-	28.18	*21.33*	177.76	*39.55*
7	1.24	*0.22*	<15.0	-	3.96	*1.34*	5.59	*1.33*	25.23	*11.62*	129.49	*21.11*
11	1.10	*0.39*	<15.0	-	4.37	*0.29*	3.52	*0.07*	**99.87**	*147.15*	99.75	*61.06*
18	<1.0	-	<15.0	-	5.04	*3.47*	1.91	*1.22*	71.19	*113.31*	50.97	*42.60*
25	<1.0	-	25.16	*1.09*	4.62	*3.68*	1.85	*0.55*	64.53	*102.21*	58.46	*84.57*
35	1.39	*1.28*	<15.0	-	2.90	*0.62*	3.04	*1.32*	54.01	*84.60*	48.44	*75.50*
136	4.35	*2.69*	34.80	*2.49*	<1.0	-	5.28	*0.67*	38.96	*39.78*	25.89	*13.22*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-455. Selected metals in the surface water after inundation of the Tolderol soil material (Site 5): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	18.03	*4.22*	15.00	*2.34*	<0.1	-	0.10	*<0.1*	<1.0	-	<1.0	-
4	55.28	*28.29*	24.12	*6.63*	<0.1	-	4.34	*0.94*	<1.0	-	5.24	*6.75*
7	40.94	*16.86*	37.30	-	<0.1	-	5.04	*0.56*	<1.0	-	5.93	*7.06*
11	36.22	*17.31*	37.53	*17.83*	0.10	*<0.1*	4.96	*1.68*	<1.0	-	4.91	*5.69*
18	n.a.	-	n.a.	-	<0.1	-	3.53	*3.02*	<1.0	-	2.44	*1.96*
25	7.73	*6.47*	15.68	*17.31*	<0.1	-	3.58	*5.19*	<1.0	-	1.39	*0.45*
35	64.20	*22.26*	**63.33**	*36.75*	<0.1	-	3.33	*4.88*	<1.0	-	<1.0	-
136	7.79	*0.96*	8.08	-	<0.1	-	1.85	*3.07*	<1.0	-	<1.0	-

Table 9-456. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	33.76	*20.04*	26.89	*1.23*	<0.1	-	1.60	*0.33*	<1.0	-	<1.0	-
4	101.06	*2.60*	**157.89**	*212.81*	0.12	*<0.1*	11.59	*14.05*	1.33	*1.26*	27.58	*6.41*
7	118.35	*64.93*	**155.19**	*24.21*	0.13	*<0.1*	4.45	*5.21*	6.14	*4.30*	29.57	*40.70*
11	137.50	-	**107.45**	*52.87*	0.16	*0.17*	2.44	*4.04*	8.30	*11.69*	34.15	*14.74*
18	n.a.	-	n.a.	-	0.13	*0.19*	1.44	*2.78*	12.97	*12.57*	27.08	*37.44*
25	45.74	*70.38*	25.33	*2.10*	0.96	*1.74*	1.14	*1.98*	17.13	*15.41*	28.14	*48.37*
35	96.66	*87.09*	**86.89**	*34.62*	<0.1	-	0.33	*<0.1*	14.96	*17.28*	44.78	*30.04*
136	35.28	*4.21*	8.45	*3.97*	<0.1	-	0.22	*0.23*	8.62	*4.97*	10.52	*12.70*

Table 9-457. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	52.49	*18.67*	**328.12**	*238.10*	1.59	*1.76*	18.31	*12.88*	1.35	*0.19*	102.07	*120.39*
4	134.26	*80.28*	**356.96**	*161.32*	1.57	*1.29*	19.51	*1.74*	1.11	*0.22*	51.34	*57.08*
7	133.86	*67.37*	**316.01**	*143.24*	1.37	*0.53*	12.94	*4.20*	1.00	*0.19*	20.31	*9.97*
11	**205.38**	-	**304.03**	*197.23*	**5.90**	*9.20*	9.87	*8.54*	38.18	*74.33*	11.00	*4.60*
18	n.a.	-	n.a.	-	4.46	*7.45*	5.04	*4.92*	21.64	*35.84*	23.11	*8.96*
25	104.69	*115.61*	**125.55**	*155.50*	3.80	*6.98*	5.17	*7.45*	23.33	*23.14*	38.75	*55.96*
35	**186.71**	*131.94*	**152.57**	*115.39*	2.98	*5.72*	5.14	*6.88*	23.59	*25.34*	32.90	*1.72*
136	41.70	*50.59*	13.78	*0.39*	<0.1	-	0.14	*<0.1*	77.44	*72.44*	78.22	*23.22*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-458. Selected metals in the surface water after inundation of the Tolderol soil material (Site 5): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	2.09	*0.06*	<4.4	-	<1.0	-	<1.0	-
4	2.36	*0.37*	<4.4	-	<1.0	-	<1.0	-
7	3.17	*0.40*	<4.4	-	<1.0	-	<1.0	-
11	3.98	*0.99*	<4.4	-	<1.0	-	<1.0	-
18	4.14	*0.47*	<4.4	-	<1.0	-	<1.0	-
25	4.23	*0.49*	<4.4	-	<1.0	-	<1.0	-
35	2.61	*0.41*	<4.4	-	<1.0	-	<1.0	-
136	2.01	*0.02*	<4.4	-	<1.0	-	<1.0	-

Table 9-459. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	2.07	*1.25*	<4.4	-	<1.0	-	<1.0	-
4	2.07	*0.67*	<4.4	-	<1.0	-	1.92	*2.91*
7	3.37	*0.78*	<4.4	-	<1.0	-	<1.0	-
11	4.57	*1.26*	<4.4	-	<1.0	-	<1.0	-
18	4.03	*0.86*	<4.4	-	<1.0	-	<1.0	-
25	4.30	*1.11*	<4.4	-	<1.0	-	<1.0	-
35	2.41	*0.20*	<4.4	-	<1.0	-	<1.0	-
136	1.89	*0.01*	<4.4	-	<1.0	-	<1.0	-

Table 9-460. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.77	*0.72*	<4.4	-	<1.0	-	<1.0	-
4	2.04	*0.53*	<4.4	-	<1.0	-	<1.0	-
7	3.31	*0.03*	<4.4	-	1.92	*2.34*	<1.0	-
11	4.29	-	<4.4	-	<1.0	-	<1.0	-
18	4.44	*0.53*	<4.4	-	1.22	*<1.0*	1.12	*1.44*
25	6.80	*5.20*	<4.4	-	<1.0	-	<1.0	-
35	2.37	*0.24*	<4.4	-	<1.0	-	1.20	*1.63*
136	1.61	*1.14*	4.53	*0.11*	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-461. Major cations in the surface water after inundation of the Tolderol soil material (Site 5): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	356	219	9879	547	13.8	8.5	316.1	20.2	28.4	9.7	393.3	23.6
4	331	216	9012	253	12.4	7.3	315.6	3.2	32.1	9.6	420.0	7.1
7	285	199	9556	34	12.6	7.0	322.3	8.1	31.7	8.9	439.4	0.6
11	291	199	9724	214	11.8	7.7	322.9	5.1	28.5	8.4	420.8	5.2
18	235	41	9940	291	9.6	2.1	356.4	6.4	27.0	5.1	410.7	1.0
25	222	67	9857	985	8.9	2.7	389.4	17.9	25.3	5.3	485.8	94.1
35	220	101	9380	83	8.1	4.1	364.0	6.0	26.5	8.7	422.3	12.8
136	317	84	12914	409	12.9	5.4	459.8	5.8	34.0	8.7	475.3	26.3

Table 9-462. Major cations in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	156	29	6282	4341	12.0	0.2	203.3	134.4	21.6	4.8	336.0	122.6
4	322	153	8753	643	16.7	3.6	304.4	18.8	39.6	8.4	438.1	7.5
7	299	163	9388	639	15.8	5.2	320.9	13.7	41.1	5.8	434.6	7.3
11	279	156	9630	511	17.8	13.1	323.2	27.3	43.4	23.5	410.8	16.0
18	315	207	9622	104	16.2	14.8	345.6	6.9	41.6	31.8	400.6	6.3
25	376	331	9193	16	17.3	18.6	363.6	7.0	48.1	49.0	437.3	28.2
35	273	203	9465	573	11.9	11.9	362.0	20.6	35.0	23.4	433.6	2.9
136	341	178	12665	140	14.0	9.6	457.4	6.5	40.9	19.5	477.3	27.7

Table 9-463. Major cations in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	620	217	1277	409	36.9	11.1	55.2	10.7	86.5	35.7	178.1	38.7
4	611	228	8630	471	35.9	10.1	296.5	38.8	89.4	40.5	423.6	59.7
7	458	41	10026	1689	31.4	4.1	329.4	45.7	73.0	21.1	457.8	88.8
11	630	408	9480	160	37.5	16.0	318.6	8.2	105.0	72.8	404.0	8.0
18	608	577	10132	878	32.8	25.3	361.3	39.2	89.4	96.4	417.5	31.4
25	534	580	8867	752	26.9	29.8	355.3	32.4	76.2	91.9	422.6	3.9
35	504	591	8981	1373	23.9	29.6	358.7	56.4	76.0	95.8	416.9	48.1
136	453	422	12491	616	18.7	19.3	450.4	12.2	66.5	63.9	480.9	3.4

Table 9-464. Major cations and anions in the surface water after inundation of the Tolderol soil material (Site 5): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	39.7	*28.1*	1227.5	*67.9*	737	*566*	20548	*766*	195	*34*	3012	*10*
4	41.4	*28.2*	1147.8	*6.8*	720	*504*	18650	*84*	159	*32*	2998	*235*
7	31.7	*22.3*	1237.2	*0.8*	681	*495*	20781	*136*	169	*58*	2750	*40*
11	29.2	*20.8*	1285.6	*58.6*	672	*499*	20567	*61*	133	*77*	2818	*<1*
18	30.5	*6.0*	1234.3	*7.3*	465	*172*	18993	*290*	137	*20*	2826	*137*
25	29.0	*7.9*	1299.2	*192.3*	419	*175*	19992	*1295*	118	*22*	2822	*361*
35	30.4	*13.0*	1137.3	*18.7*	404	*207*	19589	*889*	97	*35*	2904	*66*
136	39.4	*7.9*	1446.0	*51.0*	426	*140*	23166	*236*	130	*23*	3409	*45*

Table 9-465. Major cations and anions in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	16.7	*0.2*	781.8	*510.0*	304	*107*	13061	*9470*	159	*<1*	2067	*1213*
4	36.9	*12.8*	1126.9	*38.8*	627	*304*	17813	*2048*	171	*49*	2852	*277*
7	31.0	*13.8*	1222.8	*83.8*	672	*392*	20265	*283*	191	*57*	2712	*16*
11	28.7	*14.6*	1291.6	*96.2*	620	*351*	20239	*422*	187	*137*	2702	*38*
18	42.4	*28.3*	1209.0	*17.1*	528	*301*	17962	*265*	181	*124*	2677	*16*
25	55.1	*55.9*	1156.8	*17.4*	606	*498*	19148	*419*	302	*361*	2614	*133*
35	37.1	*24.7*	1117.3	*45.6*	480	*377*	19968	*966*	129	*90*	2892	*138*
136	45.9	*24.8*	1436.7	*52.1*	438	*227*	22953	*265*	170	*125*	3420	*59*

Table 9-466. Major cations and anions in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	84.9	*39.9*	216.4	*64.8*	1049	*298*	2328	*645*	707	*289*	1455	*222*
4	90.2	*40.9*	1143.1	*110.5*	1016	*312*	17834	*424*	658	*323*	2884	*217*
7	56.6	*13.2*	1317.5	*251.6*	865	*48*	21169	*2342*	564	*83*	2833	*421*
11	85.5	*70.0*	1267.8	*69.5*	1186	*736*	19831	*497*	778	*615*	2684	*69*
18	103.1	*112.5*	1245.7	*114.1*	944	*829*	19243	*1532*	613	*736*	2797	*210*
25	96.0	*124.9*	1115.6	*71.3*	850	*885*	18717	*1928*	588	*832*	2607	*236*
35	94.9	*127.7*	1104.1	*90.5*	794	*898*	19230	*2674*	572	*879*	2775	*227*
136	80.8	*85.4*	1412.1	*15.3*	533	*460*	22623	*632*	412	*538*	3390	*14*

Table 9-467. Selected surface water properties after inundation of the Tolderol soil material (Site 6): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.72	*0.15*	4.98	*2.14*	390	*3*	544	*66*	2.1	*0.3*	3.7	*0.1*
4	6.85	*0.91*	6.23	*0.41*	402	*179*	454	*201*	2.0	*0.1*	2.4	*0.2*
7	6.85	*0.90*	6.37	*0.14*	306	*3*	450	*203*	2.3	*<0.1*	3.4	*0.4*
11	6.79	*1.22*	6.66	*1.39*	369	*173*	403	*230*	2.3	*0.1*	3.0	*0.2*
18	6.60	*1.02*	7.32	*0.37*	340	*117*	300	*33*	1.4	*0.1*	2.5	*0.2*
25	6.92	*1.12*	7.72	*0.25*	342	*305*	412	*6*	2.1	*0.1*	2.7	*0.6*
35	6.96	*0.89*	7.59	*0.28*	294	*210*	332	*152*	2.2	*0.1*	3.1	*0.3*
136	7.73	*0.09*	7.54	*0.03*	163	*26*	189	*9*	2.8	-	2.4	*0.4*

Table 9-468. Selected pore-water properties (3-5 cm) after inundation of the Tolderol soil material (Site 6): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	4.39	*0.33*	4.46	*1.85*	615	*12*	555	*102*	0.7	*0.1*	0.8	*0.4*
4	6.32	*1.22*	5.06	*0.53*	460	*208*	485	*164*	0.7	*0.3*	0.7	*<0.1*
7	6.57	*0.89*	4.98	*0.93*	454	*260*	587	*41*	1.7	*0.5*	1.8	*0.7*
11	6.68	*1.01*	5.74	*0.09*	235	*83*	415	*194*	2.2	*0.6*	1.8	*0.1*
18	6.19	-	6.13	*1.57*	197	-	400	*125*	1.6	-	1.8	*0.7*
25	6.79	*0.62*	6.38	*0.62*	157	*43*	468	*96*	3.0	*0.1*	2.0	*0.6*
35	6.75	*0.44*	6.38	*0.19*	145	*25*	339	*63*	3.3	*<0.1*	2.5	*1.1*
136	6.88	*0.04*	6.92	*0.21*	138	*9*	175	*2*	3.8	*0.9*	2.4	*1.1*

Table 9-469. Selected pore-water properties (10-12 cm) after inundation of the Tolderol soil material (Site 6): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3.43	*0.06*	3.33	*0.40*	710	*2*	739	*16*	0.2	*0.1*	0.2	*0.4*
4	3.63	*0.01*	3.25	*0.33*	693	*4*	702	*23*	0.0	*0.0*	0.0	*0.0*
7	3.87	*0.03*	3.35	*0.23*	699	*5*	734	*8*	0.0	*0.0*	0.9	*0.9*
11	3.94	*0.04*	3.90	*0.74*	642	*45*	628	*8*	0.0	*0.0*	0.4	*0.5*
18	3.89	*0.11*	4.43	*1.20*	647	*31*	522	*24*	0.0	*0.0*	0.2	*0.3*
25	4.18	*0.11*	4.74	*2.13*	626	*38*	537	*192*	0.1	*0.1*	0.6	*0.9*
35	4.75	*0.81*	5.04	*1.85*	348	*258*	401	*191*	0.3	*0.2*	1.4	*1.4*
136	6.61	*0.07*	6.60	*0.33*	140	*11*	206	*22*	4.2	*1.2*	2.4	*1.6*

Table 9-470. Selected surface water properties after inundation of the Tolderol soil material (Site 6): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.4	-	3.4	-
4	<0.2	-	<0.2	-	0.35	<0.2	0.58	0.35				
7	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.1	-	5.1	-
18	0.54	<0.2	0.54	<0.2	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	12.0	-	4.9	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.0	0.5	3.1	0.4

Table 9-471. Selected pore-water properties (3-5 cm) after inundation of the Tolderol soil material (Site 6): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.20	0.40	0.25	0.30	0.33	0.45	7.7	-	6.4	-
4	<0.2	-	<0.2	-	0.40	<0.2	0.45	0.30				
7	<0.2	-	0.28	0.35	<0.2	-	0.48	0.65				
11	1.03	1.55	<0.2	-	0.26	0.45	<0.2	-	8.1	-	5.6	-
18	10.09	-	0.55	<0.2	0.66	-	<0.2	-				
25	13.09	2.03	<0.2	-	1.45	0.38	0.25	0.31				
35	21.22	3.09	<0.2	-	1.13	0.30	<0.2	-	8.6	-	5.4	-
136	15.60	4.67	9.97	15.92	2.10	0.52	<0.2	-	12.0	2.0	4.5	0.7

Table 9-472. Selected pore-water properties (10-12 cm) after inundation of the Tolderol soil material (Site 6): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.68	<0.2	0.50	1.00	<0.2	-	1.35	0.90	9.6	-	10.0	-
4	0.20	<0.2	0.75	1.10	0.70	<0.2	1.68	0.25				
7	0.20	0.20	0.80	0.70	<0.2	-	0.25	0.30				
11	<0.2	-	<0.2	-	<0.2	-	0.41	0.82	6.9	-	6.5	-
18	0.71	<0.2	0.73	<0.2	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	0.30	0.52	<0.2	-				
35	0.28	<0.2	2.37	2.99	<0.2	-	<0.2	-	0.2	-	6.4	-
136	77.98	11.66	6.00	8.76	4.56	3.18	<0.2	-	18.0	6.0	6.2	3.0

Table 9-473. Selected nutrients in the surface water after inundation of the Tolderol soil material (Site 6): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.045	*0.030*	<0.005	-	0.035	*0.010*	0.025	*0.010*
4	0.070	*0.040*	0.050	*<0.005*	0.025	*0.010*	0.005	*0.010*
7	0.175	*0.030*	0.095	*0.030*	0.020	*0.040*	0.010	*0.020*
11	0.410	*0.120*	0.080	*0.040*	0.025	*0.030*	<0.005	-
18	0.535	*0.210*	0.070	*0.020*	0.025	*0.030*	0.010	*<0.005*
25	0.645	*0.170*	0.125	*0.110*	0.005	*0.010*	0.020	*<0.005*
35	0.640	*0.160*	0.720	*0.220*	0.010	*<0.005*	0.430	*0.100*
136	0.665	*0.010*	3.030	*0.400*	0.005	*0.010*	0.005	*0.010*

Table 9-474. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.510	*0.800*	0.265	*0.030*	0.030	*<0.005*	0.025	*0.010*
4	0.635	*1.050*	0.080	*<0.005*	0.020	*<0.005*	0.005	*0.010*
7	0.325	*0.450*	0.095	*0.050*	0.035	*0.010*	0.010	*<0.005*
11	0.240	*0.240*	0.095	*0.010*	0.005	*0.010*	<0.005	-
18	0.140	-	0.090	*<0.005*	0.050	-	0.025	*0.010*
25	0.175	*0.050*	0.310	*0.200*	0.065	*0.010*	0.075	*0.050*
35	0.205	*0.050*	0.415	*0.430*	0.100	*0.020*	0.195	*0.170*
136	0.045	*0.010*	0.785	*0.590*	0.065	*0.050*	0.035	*0.010*

Table 9-475. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.820	*0.220*	0.505	*0.090*	0.055	*0.030*	0.030	*<0.005*
4	0.895	*0.450*	0.090	*0.040*	0.070	*0.100*	0.005	*0.010*
7	0.860	*0.860*	0.055	*0.090*	0.050	*0.040*	<0.005	-
11	0.880	*0.760*	0.170	*0.120*	0.025	*0.030*	<0.005	-
18	0.905	*0.870*	0.080	*0.000*	0.060	*0.020*	0.010	*<0.005*
25	0.910	*0.800*	0.150	*0.120*	0.015	*0.010*	0.015	*0.030*
35	0.605	*0.550*	0.150	*0.080*	0.015	*0.010*	0.060	*0.060*
136	<0.005	-	0.160	*0.100*	0.170	*<0.005*	0.010	*<0.005*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-476. Selected nutrients in the surface water after inundation of the Tolderol soil material (Site 6): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.010	*<0.005*	0.010	*<0.005*	0.210	*0.040*	0.005	*0.010*
4	0.075	*0.030*	0.060	*<0.005*	0.080	*0.060*	0.450	*0.120*
7	0.030	*0.020*	0.015	*0.010*	0.550	*0.080*	0.560	*<0.005*
11	0.045	*0.030*	0.020	*<0.005*	0.115	*0.070*	0.890	*0.040*
18	0.060	*0.040*	0.010	*<0.005*	0.170	*0.100*	0.765	*0.190*
25	0.065	*0.050*	0.010	*0.020*	0.075	*0.010*	1.005	*0.490*
35	0.055	*0.030*	0.010	*<0.005*	0.055	*0.010*	0.495	*0.270*
136	0.055	*0.050*	0.010	*<0.005*	0.330	*0.020*	0.055	*0.010*

Table 9-477. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.035	*0.010*	0.025	*0.010*	1.715	*2.530*	0.980	*0.360*
4	0.060	*0.020*	0.060	*<0.005*	0.865	*1.030*	1.285	*0.330*
7	0.025	*0.030*	0.015	*0.010*	0.870	*0.300*	1.565	*0.010*
11	0.020	*0.020*	0.015	*0.010*	0.465	*0.110*	**1.930**	*0.240*
18	0.020	-	0.010	*<0.005*	0.890	-	1.575	*0.930*
25	0.050	*0.040*	0.015	*0.010*	0.600	*0.080*	**2.275**	*0.390*
35	0.075	*0.010*	<0.005	*<0.005*	0.645	*0.090*	**2.020**	*0.300*
136	0.075	*0.030*	0.030	*0.020*	1.780	*0.400*	0.910	*0.900*

Table 9-478. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.030	*<0.005*	0.030	*0.020*	**3.720**	*2.040*	**2.390**	*0.200*
4	0.085	*0.030*	0.060	*0.020*	**2.905**	*1.790*	1.520	*0.100*
7	0.015	*0.010*	0.020	*<0.005*	2.295	*1.130*	**1.935**	*0.250*
11	0.020	*<0.005*	0.330	*0.640*	1.795	*0.930*	**3.465**	*1.550*
18	0.010	*<0.005*	0.015	*0.010*	1.840	*0.520*	**3.715**	*0.130*
25	0.015	*0.010*	0.015	*0.030*	1.645	*0.330*	**4.545**	*0.570*
35	0.005	*0.010*	0.005	*0.010*	1.630	*0.240*	**4.130**	*1.320*
136	0.190	*0.040*	0.020	*<0.005*	**6.375**	*1.310*	1.470	*0.880*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-479. Selected metals in the surface water after inundation of the Tolderol soil material (Site 6): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.02*	0.03	*0.02*	0.03	*<0.01*	0.03	*0.04*	<0.01	-	0.04	*0.02*
4	0.03	*<0.01*	0.08	*0.01*	0.04	*<0.01*	0.01	*<0.01*	<0.01	-	1.93	*0.41*
7	<0.01	-	0.09	*0.01*	0.06	*0.03*	0.08	*<0.01*	<0.01	-	1.86	*0.44*
11	<0.01	-	0.09	*0.01*	0.03	*<0.01*	0.02	*0.03*	<0.01	-	2.06	*0.97*
18	<0.01	-	0.08	*0.01*	0.07	*0.03*	0.06	*0.03*	<0.01	-	1.33	*0.63*
25	0.02	*<0.01*	0.09	*0.05*	0.06	*0.05*	0.04	*0.02*	<0.01	-	1.35	*0.94*
35	0.02	*<0.01*	0.07	*0.05*	0.03	*<0.01*	0.03	*0.04*	<0.01	-	1.06	*0.87*
136	0.01	*<0.01*	0.05	*0.02*	0.07	*<0.01*	0.14	*<0.01*	<0.01	-	0.21	*0.41*

Table 9-480. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.34	*0.27*	10.69	*14.30*	0.04	*<0.01*	0.35	*0.59*	2.20	*2.27*	5.39	*0.04*
4	0.10	*0.07*	5.04	*6.23*	0.04	*<0.01*	0.05	*0.04*	1.43	*1.07*	2.30	*1.17*
7	0.01	*0.02*	2.97	*2.66*	0.06	*0.02*	0.17	*0.23*	0.67	*0.18*	1.81	*0.31*
11	<0.01	-	0.34	*0.17*	1.27	*1.00*	0.02	*<0.01*	1.63	*1.24*	1.29	*0.30*
18	<0.01	-	0.04	*0.03*	8.37	-	0.05	*<0.01*	2.33	-	0.51	*0.14*
25	<0.01	-	0.02	*0.01*	11.99	*1.51*	0.05	*0.06*	2.85	*0.35*	0.54	*0.30*
35	0.01	*<0.01*	0.01	*<0.01*	19.05	*0.65*	0.08	*0.07*	3.40	*1.80*	0.95	*0.54*
136	0.01	*<0.01*	0.02	*0.02*	17.30	*4.17*	9.65	*15.02*	3.07	*2.66*	0.25	*0.02*

Table 9-481. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	5.81	*2.29*	10.77	*1.46*	0.65	*0.06*	1.46	*1.51*	**13.73**	*4.29*	12.26	*3.90*
4	5.30	*1.58*	12.86	*4.89*	0.48	*0.03*	1.71	*1.86*	**13.42**	*2.38*	2.49	*0.87*
7	2.06	*0.58*	8.37	*2.22*	0.26	*<0.01*	1.30	*0.79*	**6.75**	*0.89*	1.82	*0.31*
11	1.80	*0.72*	4.63	*1.17*	0.21	*0.07*	0.55	*0.71*	**7.04**	*1.98*	1.36	*0.01*
18	1.87	*0.84*	2.37	*1.36*	0.20	*0.06*	0.36	*0.44*	**6.63**	*2.64*	1.04	*0.10*
25	1.58	*0.45*	1.08	*1.32*	0.18	*0.07*	0.38	*0.06*	**5.86**	*1.61*	1.13	*0.06*
35	1.00	*0.12*	0.43	*0.85*	0.22	*0.04*	2.08	*2.57*	**6.63**	*1.89*	0.82	*0.19*
136	<0.01	-	<0.01	-	82.06	*16.36*	5.81	*8.09*	**8.88**	*2.41*	0.19	*0.03*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-482. Selected metalloids and metals in the surface water after inundation of the Tolderol soil material (Site 6): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.05	0.41	<15.0	-	1.34	0.56	<1.0	-	1.71	0.44	<5.0	-
4	<1.0	-	<15.0	-	<1.0	-	3.07	1.43	1.85	0.85	67.83	3.57
7	<1.0	-	<15.0	-	2.60	0.04	5.75	0.90	2.36	0.70	59.82	3.91
11	1.09	0.25	<15.0	-	1.61	0.19	6.25	3.83	1.97	0.31	69.68	18.12
18	<1.0	-	<15.0	-	1.86	1.51	3.30	1.95	1.59	0.06	39.53	7.44
25	<1.0	-	32.56	0.28	3.76	3.27	2.81	1.27	2.05	0.37	41.37	14.69
35	1.14	0.14	<15.0	-	2.34	0.09	2.57	0.47	1.92	0.18	25.84	11.35
136	1.35	1.73	34.98	5.40	1.53	0.12	4.46	0.45	2.72	0.37	14.48	5.94

Table 9-483. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.44	0.10	<15.0	-	3.92	1.72	**25.46**	34.08	**107.27**	88.78	277.83	70.10
4	<1.0	-	<15.0	-	2.91	1.03	**11.48**	9.36	65.56	43.75	84.50	51.56
7	<1.0	-	<15.0	-	3.84	0.46	**16.19**	4.42	17.24	9.57	60.94	24.28
11	1.91	0.43	<15.0	-	2.66	1.50	5.74	1.95	17.51	4.37	50.80	7.89
18	6.14	-	<15.0	-	2.29	-	2.25	0.68	24.59	-	20.58	10.82
25	4.27	3.33	31.95	6.32	1.97	0.44	3.04	0.44	20.30	7.01	25.54	13.61
35	8.97	5.17	<15.0	-	1.74	0.86	1.70	0.34	16.44	9.04	18.74	5.37
136	11.32	8.27	40.27	7.75	<1.0	-	5.98	2.77	6.80	3.19	7.22	5.22

Table 9-484. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	2.08	0.90	<15.0	-	**24.07**	1.90	**34.39**	6.10	**377.24**	99.02	367.00	32.42
4	1.26	0.35	<15.0	-	**19.27**	3.19	**30.35**	6.53	**375.45**	36.48	81.96	4.88
7	<1.0	-	<15.0	-	12.43	1.60	**29.75**	5.07	**219.96**	10.50	52.39	2.79
11	<1.0	-	<15.0	-	11.77	2.83	**20.57**	6.19	**210.85**	28.87	39.94	10.10
18	<1.0	-	15.24	0.23	9.88	1.98	**13.60**	9.20	**203.63**	35.99	25.43	4.13
25	<1.0	-	31.55	5.55	7.86	0.58	**9.87**	10.56	**197.54**	20.00	22.35	5.31
35	<1.0	-	<15.0	-	5.74	0.53	5.88	7.71	**159.96**	37.08	6.78	4.81
136	31.65	7.55	43.23	31.09	<1.0	-	4.84	0.05	13.27	4.39	4.53	2.87

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-485. Selected metals in the surface water after inundation of the Tolderol soil material (Site 6): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	18.41	1.52	19.17	0.59	<0.1	-	0.15	<0.1	<1.0	-	<1.0	-
4	60.98	26.98	**140.87**	42.20	<0.1	-	0.96	0.16	<1.0	-	49.61	7.39
7	45.66	21.63	**93.59**	31.68	0.10	<0.1	0.69	0.28	<1.0	-	47.44	6.43
11	29.84	5.62	**104.67**	0.48	0.11	<0.1	0.96	0.16	<1.0	-	51.42	18.97
18	n.a.	-	n.a.	-	<0.1	-	0.64	<0.1	<1.0	-	32.75	11.65
25	8.58	2.42	27.75	20.66	<0.1	-	0.69	0.41	<1.0	-	31.62	19.72
35	51.24	25.46	**61.51**	30.97	<0.1	-	0.57	0.19	<1.0	-	25.24	16.06
136	5.33	1.16	<5.0	-	<0.1	-	0.36	0.14	<1.0	-	6.83	11.75

Table 9-486. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**127.18**	46.31	**306.96**	28.86	0.95	0.74	3.40	0.20	69.93	51.60	**166.20**	7.68
4	**163.99**	0.35	**219.67**	3.77	0.55	0.39	1.07	0.21	41.58	26.90	66.00	53.45
7	**180.60**	111.21	**210.12**	67.66	0.19	0.10	1.07	0.16	12.13	4.91	53.74	23.14
11	**176.49**	72.15	**138.03**	83.12	<0.1	-	1.13	0.27	27.93	12.48	34.25	26.54
18	n.a.	-	n.a.	-	0.13	-	0.64	<0.1	39.38	-	11.01	4.30
25	39.00	11.48	**63.35**	9.41	<0.1	-	0.62	<0.1	47.93	18.02	12.81	4.56
35	73.43	2.09	**100.97**	1.38	<0.1	-	0.65	<0.1	42.93	1.67	28.66	24.61
136	12.63	1.40	19.32	11.93	<0.1	-	0.13	<0.1	12.30	6.44	7.89	3.34

Table 9-487. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**314.95**	104.36	**330.03**	1.90	3.88	0.82	3.81	0.62	346.59	92.92	**337.91**	42.92
4	**432.33**	120.39	**322.21**	189.44	3.46	0.23	0.95	<0.1	300.93	50.18	73.41	13.52
7	**306.13**	4.67	**251.55**	3.45	1.85	<0.1	0.71	0.30	171.87	21.98	54.44	3.70
11	**311.39**	29.05	**225.19**	7.51	1.58	<0.1	0.76	0.25	168.97	46.16	42.75	6.50
18	n.a.	-	n.a.	-	1.84	0.17	0.59	0.13	164.04	50.42	33.08	3.50
25	148.03	11.04	**121.23**	54.78	1.72	0.28	0.68	<0.1	147.40	22.90	27.70	3.42
35	**201.11**	48.54	**151.88**	78.74	1.37	0.24	0.58	<0.1	129.76	31.81	20.02	11.39
136	24.91	18.69	23.66	11.51	<0.1	-	0.13	<0.1	24.64	7.28	4.10	1.57

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-488. Selected metals in the surface water after inundation of the Tolderol soil material (Site 6): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.36	*0.86*	<4.4	-	<1.0	-	<1.0	-
4	1.53	*0.38*	<4.4	-	<1.0	-	2.05	*1.44*
7	2.53	*0.74*	<4.4	-	<1.0	-	1.10	*<1.0*
11	3.19	*0.91*	<4.4	-	<1.0	-	<1.0	-
18	3.57	*0.62*	<4.4	-	<1.0	-	<1.0	-
25	3.51	*0.20*	<4.4	-	<1.0	-	<1.0	-
35	2.13	*0.22*	<4.4	-	<1.0	-	<1.0	-
136	2.48	*2.46*	<4.4	-	<1.0	-	<1.0	-

Table 9-489. Selected metals in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.44	*0.31*	5.06	*5.78*	<1.0	-	**24.77**	*43.90*
4	1.42	*0.82*	<4.4	-	<1.0	-	**15.84**	*21.01*
7	2.52	*0.89*	<4.4	-	<1.0	-	7.48	*4.09*
11	3.35	*0.17*	<4.4	-	<1.0	-	1.55	*1.71*
18	2.86	-	<4.4	-	<1.0	-	<1.0	-
25	3.15	*0.74*	<4.4	-	1.26	*2.26*	<1.0	-
35	2.31	*0.30*	<4.4	-	<1.0	-	<1.0	-
136	1.14	*0.08*	5.13	*1.21*	<1.0	-	<1.0	-

Table 9-490. Selected metals in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	12.42	*3.29*	18.94	*9.68*	6.48	*3.01*	3.52	*3.71*
4	5.95	*2.38*	9.47	*9.31*	8.04	*5.79*	**17.44**	*11.31*
7	4.23	*0.81*	7.75	*4.21*	4.87	*1.36*	11.00	*2.34*
11	4.74	*0.26*	4.81	*3.86*	4.86	*1.52*	8.35	*3.36*
18	4.11	*0.04*	<4.4	-	4.30	*<1.0*	5.93	*1.94*
25	3.32	*0.53*	<4.4	-	2.63	*1.66*	2.75	*3.38*
35	2.68	*0.94*	<4.4	-	2.10	*1.87*	1.76	*3.52*
136	1.24	*0.60*	5.40	*2.09*	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-491. Major cations in the surface water after inundation of the Tolderol soil material (Site 6): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	196	*199*	10873	*1294*	7.6	*7.4*	348.9	*15.7*	21.9	*9.0*	451.2	*34.2*
4	174	*136*	9489	*402*	7.4	*5.9*	349.8	*1.1*	26.5	*3.5*	472.6	*38.5*
7	151	*124*	9474	*65*	7.2	*5.7*	323.9	*7.2*	26.6	*6.7*	444.5	*7.7*
11	145	*115*	11062	*2828*	6.5	*4.7*	361.4	*74.7*	23.8	*6.2*	500.3	*128.3*
18	175	*111*	9386	*433*	7.5	*4.5*	346.2	*3.5*	25.7	*0.3*	426.3	*3.0*
25	163	*100*	10403	*856*	6.9	*4.3*	394.7	*27.7*	24.3	*2.3*	515.7	*43.9*
35	182	*132*	9433	*788*	6.8	*4.8*	373.5	*21.3*	27.1	*4.0*	446.1	*6.9*
136	256	*173*	13078	*67*	9.9	*5.4*	464.0	*1.0*	42.1	*1.4*	506.3	*1.4*

Table 9-492. Major cations in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	130	*23*	4353	*1124*	10.8	*3.0*	138.7	*36.1*	41.1	*24.3*	266.5	*20.1*
4	199	*142*	9307	*108*	11.4	*3.1*	325.9	*0.6*	49.0	*12.4*	490.4	*7.8*
7	177	*179*	8987	*333*	9.4	*6.9*	294.5	*14.9*	35.6	*18.7*	440.7	*25.5*
11	155	*135*	10026	*1878*	7.6	*4.7*	326.7	*52.5*	31.5	*7.4*	455.3	*67.4*
18	115	-	9298	*619*	5.5	-	339.8	*5.2*	34.8	-	417.8	*2.1*
25	178	*132*	10023	*199*	7.1	*4.5*	379.4	*1.6*	34.6	*3.0*	503.7	*29.3*
35	176	*85*	9093	*122*	6.1	*3.0*	362.0	*6.2*	38.1	*6.1*	452.6	*7.1*
136	255	*157*	12624	*115*	9.2	*4.9*	452.0	*1.9*	71.0	*19.1*	498.6	*4.0*

Table 9-493. Major cations in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): Na^{+}, K^{+}, and Ca^{2+}.

	Na^{+} (ppm)				K^{+} (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	385	*51*	782	*623*	15.4	*2.8*	22.3	*17.6*	184.0	*32.1*	207.9	*12.3*
4	356	*31*	8947	*654*	14.5	*2.6*	308.9	*22.0*	173.3	*24.2*	475.5	*15.3*
7	243	*47*	9254	*118*	12.2	*2.8*	299.3	*9.4*	105.2	*13.9*	444.2	*16.2*
11	251	*49*	9127	*1565*	11.5	*3.4*	288.3	*45.9*	100.1	*21.4*	399.5	*82.5*
18	296	*57*	9529	*989*	12.0	*3.6*	327.9	*11.3*	108.2	*34.6*	423.8	*9.2*
25	304	*74*	9963	*1672*	11.3	*4.4*	369.8	*61.1*	106.9	*32.3*	531.3	*150.0*
35	288	*74*	8957	*780*	9.4	*3.0*	342.9	*0.4*	116.6	*40.4*	430.5	*1.8*
136	293	*125*	12378	*420*	11.4	*1.9*	444.5	*11.1*	129.4	*49.9*	492.5	*12.0*

Table 9-494. Major cations and anions in the surface water after inundation of the Tolderol soil material (Site 6): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	21.6	*21.4*	1298.9	*127.2*	333	*395*	21024	*1480*	141	*73*	3070	*273*
4	21.2	*15.9*	1240.1	*49.0*	314	*282*	18494	*1531*	126	*57*	2930	*183*
7	16.4	*12.5*	1209.8	*59.9*	324	*257*	20509	*181*	135	*40*	2709	*67*
11	14.5	*11.1*	1550.7	*501.7*	305	*240*	21918	*4433*	105	*33*	2706	*12*
18	22.8	*12.7*	1196.2	*43.5*	290	*204*	18571	*620*	114	*35*	2764	*52*
25	22.5	*13.7*	1320.7	*152.5*	281	*211*	20303	*1001*	93	*33*	2865	*131*
35	24.3	*15.6*	1121.7	*62.7*	293	*219*	20158	*1210*	93	*45*	2946	*64*
136	33.1	*17.7*	1452.3	*36.4*	337	*206*	23471	*64*	121	*37*	3524	*17*

Table 9-495. Major cations and anions in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	17.5	*9.8*	501.2	*149.8*	224	*27*	8106	*2189*	251	*112*	1563	*400*
4	22.1	*9.9*	1220.8	*9.2*	367	*272*	18219	*125*	210	*6*	2913	*<1*
7	15.2	*16.3*	1169.8	*17.1*	376	*362*	19370	*674*	157	*61*	2686	*150*
11	13.9	*13.2*	1378.8	*308.5*	327	*270*	20069	*2363*	117	*39*	2822	*371*
18	13.8	-	1167.7	*18.2*	198	-	18044	*305*	105	-	2705	*6*
25	22.8	*16.8*	1294.4	*61.6*	309	*222*	19488	*212*	98	*39*	2817	*35*
35	22.8	*11.5*	1106.8	*3.9*	302	*165*	19349	*620*	90	*10*	2905	*20*
136	34.5	*13.0*	1397.4	*3.1*	330	*200*	22574	*275*	195	*31*	3401	*29*

Table 9-496. Major cations and anions in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	72.5	*10.1*	115.3	*59.3*	563	*23*	1250	*1250*	1108	*117*	1183	*32*
4	76.0	*4.9*	1206.8	*92.8*	519	*<1*	17917	*1000*	912	*141*	2933	*47*
7	33.7	*0.9*	1206.1	*43.1*	469	*137*	19901	*98*	581	*141*	2791	*33*
11	30.6	*2.2*	1181.7	*218.2*	478	*178*	18636	*2798*	503	*163*	2657	*458*
18	49.5	*4.1*	1194.8	*108.8*	451	*145*	17657	*489*	558	*208*	2703	*130*
25	49.4	*3.3*	1323.9	*306.7*	437	*168*	19140	*1950*	581	*163*	2951	*422*
35	51.0	*2.7*	1087.0	*77.3*	422	*150*	18940	*594*	529	*175*	2851	*172*
136	52.3	*7.6*	1396.8	*19.0*	348	*185*	22394	*270*	541	*119*	3414	*93*

Table 9-497. Selected surface water properties after inundation of the Point Sturt (South) soil material (Site 7): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.71	*0.00*	5.98	*0.57*	527	*93*	599	*20*	2.1	*0.1*	3.6	*0.1*
4	6.50	*0.54*	6.12	*0.01*	423	*125*	579	*14*	1.7	*0.1*	2.5	*0.2*
7	5.85	*0.44*	6.26	*0.02*	508	*204*	558	*62*	2.0	*0.1*	3.6	*0.1*
11	6.34	*0.33*	6.35	*0.11*	403	*204*	530	*13*	1.9	*0.1*	2.6	*<0.1*
18	6.49	*0.55*	6.30	*0.17*	409	*150*	459	*9*	1.1	*<0.1*	1.7	*0.4*
25	6.24	*0.36*	7.09	*0.45*	378	*251*	472	*89*	1.5	*0.1*	1.7	*0.7*
35	6.32	*0.33*	6.40	*1.28*	326	*53*	394	*115*	1.6	*0.2*	1.6	*1.0*
136	6.98	*0.67*	5.04	*2.31*	277	*211*	422	*127*	1.2	*0.1*	1.1	*1.5*

Table 9-498. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.60	*0.11*	2.67	*0.07*	787	*17*	791	*12*	0.0	*0.0*	0.0	*0.0*
4	2.91	*0.33*	3.13	*0.90*	766	*48*	735	*58*	0.0	*0.0*	0.0	*0.1*
7	2.94	*0.22*	3.51	*1.45*	761	*39*	726	*96*	0.0	*0.0*	0.6	*1.1*
11	3.07	*0.51*	3.99	*2.19*	741	*78*	584	*312*	0.0	*0.0*	0.6	*1.1*
18	4.69	*3.44*	3.82	*1.75*	556	*358*	639	*85*	0.3	*0.5*	0.2	*0.4*
25	4.26	*2.72*	4.26	*2.59*	549	*342*	574	*233*	0.2	*0.5*	0.3	*0.7*
35	3.88	*1.67*	4.26	*2.13*	570	*208*	555	*188*	0.1	*0.3*	0.6	*1.2*
136	3.80	*0.45*	4.45	*2.10*	464	*55*	461	*163*	0.0	*0.0*	0.2	*0.4*

Table 9-499. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.43	*0.04*	2.48	*0.05*	757	*80*	801	*1*	0.0	*0.0*	0.0	*0.0*
4	2.50	*0.05*	2.45	*0.04*	703	*76*	733	*23*	0.0	*0.0*	0.0	*0.0*
7	2.49	*0.03*	2.54	*0.07*	678	*45*	711	*18*	0.0	*0.0*	0.0	*0.0*
11	2.52	*0.06*	2.68	*0.12*	648	*32*	550	*250*	0.0	*0.0*	0.0	*0.0*
18	2.76	*0.41*	2.73	*0.05*	646	*74*	658	*6*	0.0	*0.0*	0.0	*0.0*
25	2.75	*0.25*	2.76	*0.00*	623	*42*	632	*8*	0.0	*0.0*	0.0	*0.0*
35	2.80	*0.19*	2.92	*0.01*	594	*21*	596	*1*	0.0	*0.0*	0.0	*0.0*
136	3.40	*0.17*	3.40	*0.14*	499	*15*	504	*26*	0.0	*0.0*	0.0	*0.0*

Table 9-500. Selected surface water properties after inundation of the Point Sturt (South) soil material (Site 7): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.35	0.70	<0.2	-	<0.2	-	<0.2	-	7.8	-	3.4	-
4	<0.2	-	<0.2	-	0.45	<0.2	0.35	0.40				
7	<0.2	-	<0.2	-	<0.2	-	0.40	<0.2				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	5.8	-	4.5	-
18	0.55	<0.2	0.55	<0.2	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.7	-	4.2	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.8	0.5	3.4	0.6

Table 9-501. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1.93	1.15	1.50	0.20	2.50	4.00	6.10	8.20	14.0	-	14.0	-
4	0.55	1.10	0.98	0.25	3.08	4.35	3.53	7.05				
7	0.20	0.40	1.08	0.35	1.50	3.00	1.73	3.45				
11	<0.2	-	<0.2	-	1.88	3.68	2.91	5.82	8.5	-	8.3	-
18	0.89	0.66	2.63	4.08	0.43	0.81	6.21	12.40				
25	0.88	0.83	5.64	11.23	0.98	1.88	6.01	11.92				
35	2.75	1.76	7.67	15.23	1.10	2.05	2.23	4.47	22.0	-	5.7	-
136	85.45	164.97	26.70	40.41	0.53	1.06	<0.2	-	8.5	1.5	4.2	1.6

Table 9-502. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	13.88	18.85	2.73	0.45	22.03	19.15	12.38	3.95	20.0	-	18.0	-
4	32.55	55.50	5.58	2.75	23.60	7.00	14.10	2.00				
7	36.90	50.20	10.15	5.80	25.75	18.10	5.90	1.60				
11	51.30	59.40	12.80	8.10	28.65	27.94	13.36	2.11	18.0	-	12.0	-
18	96.69	180.91	28.77	14.25	3.17	2.15	3.50	2.00				
25	114.72	192.00	38.51	16.02	4.78	5.79	4.02	1.10				
35	165.97	243.89	68.78	8.80	5.88	10.25	2.73	3.51	7.8	-	7.4	-
136	348.23	366.03	188.89	49.95	<0.2	-	<0.2	-	19.0	12.0	7.8	0.4

Table 9-503. Selected nutrients in the surface water after inundation of the Point Sturt (South) soil material (Site 7): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.050	*0.020*	0.025	*0.050*	0.030	*<0.005*	0.015	*0.030*
4	0.080	*<0.005*	0.005	*0.010*	0.005	*0.010*	0.005	*0.010*
7	0.100	*0.020*	0.035	*0.010*	0.015	*0.010*	0.025	*0.050*
11	0.250	*0.080*	0.080	*<0.005*	0.020	*<0.005*	0.005	*0.010*
18	0.395	*0.130*	0.060	*0.040*	0.010	*<0.005*	0.025	*0.030*
25	0.600	*0.080*	0.185	*0.230*	<0.005	-	0.005	*0.010*
35	0.700	*0.100*	0.310	*0.240*	0.005	*0.010*	0.005	*0.010*
136	1.505	*0.270*	1.440	*2.860*	<0.005	-	<0.005	-

Table 9-504. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.070	*0.019*	0.055	*0.010*	0.036	*0.009*	0.040	*0.020*
4	0.070	*<0.005*	0.029	*<0.005*	0.015	*0.010*	<0.005	-
7	0.140	*<0.005*	0.095	*0.130*	0.005	*0.010*	0.010	*0.020*
11	0.165	*0.150*	0.035	*0.030*	0.005	*0.010*	<0.005	-
18	0.595	*0.210*	0.060	*<0.005*	0.020	*0.040*	0.015	*0.010*
25	0.620	*0.320*	0.075	*0.050*	0.005	*0.010*	<0.005	-
35	0.550	*0.200*	0.175	*0.030*	0.005	*0.010*	0.020	*0.040*
136	0.635	*0.670*	1.145	*2.130*	0.015	*0.030*	0.005	*0.010*

Table 9-505. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.050	*0.020*	0.068	*0.016*	0.045	*0.010*	0.037	*0.006*
4	0.025	*0.010*	0.015	*0.010*	0.015	*0.010*	0.010	*<0.005*
7	0.040	*0.040*	0.035	*0.030*	0.020	*<0.005*	0.020	*0.020*
11	0.055	*0.050*	0.050	*0.060*	<0.005	-	<0.005	-
18	0.175	*0.330*	0.055	*0.010*	0.015	*0.010*	0.015	*0.010*
25	0.120	*0.120*	0.130	*0.220*	<0.005	-	0.005	*0.010*
35	0.100	*0.020*	0.140	*0.200*	<0.005	-	<0.005	-
136	0.065	*0.050*	0.130	*0.080*	0.005	*0.010*	<0.005	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-506. Selected nutrients in the surface water after inundation of the Point Sturt (South) soil material (Site 7): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.015	*0.010*	0.015	*0.010*	0.215	*0.030*	0.015	*0.010*
4	0.055	*0.010*	0.060	*<0.005*	0.095	*0.010*	0.300	*0.020*
7	0.005	*0.010*	0.025	*0.030*	0.575	*0.010*	0.440	*<0.005*
11	0.010	*<0.005*	0.035	*0.030*	0.140	*0.060*	0.835	*0.230*
18	0.025	*0.010*	0.005	*0.010*	0.715	*0.350*	0.830	*0.220*
25	0.020	*<0.005*	0.010	*<0.005*	0.080	*0.020*	1.295	*0.410*
35	0.020	*<0.005*	0.005	*0.010*	0.060	*0.020*	1.165	*0.510*
136	0.035	*0.010*	0.020	*0.020*	0.310	*0.020*	1.370	*2.620*

Table 9-507. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.055	*0.050*	0.070	*<0.005*	**2.750**	*0.120*	**2.910**	*1.600*
4	0.090	*0.020*	0.105	*0.010*	1.790	*0.500*	**1.735**	*1.130*
7	0.030	*0.020*	0.035	*0.030*	**2.830**	*1.980*	**2.310**	*0.920*
11	0.030	*0.020*	0.065	*0.050*	1.580	*0.880*	**2.945**	*2.190*
18	0.010	*<0.005*	0.020	*0.020*	1.100	*1.700*	**2.505**	*1.810*
25	0.015	*0.010*	0.025	*0.010*	0.980	*1.500*	**2.925**	*2.170*
35	0.025	*0.030*	0.030	*0.020*	1.185	*1.670*	**2.155**	*1.250*
136	0.040	*0.060*	0.055	*0.070*	**2.735**	*3.190*	**2.700**	*3.480*

Table 9-508. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.055	*0.010*	0.045	*0.010*	**6.105**	*0.730*	**4.780**	*0.660*
4	0.105	*0.010*	0.090	*<0.005*	**5.375**	*0.670*	**4.130**	*0.440*
7	0.045	*0.010*	0.040	*<0.005*	**5.680**	*0.820*	**3.940**	*0.900*
11	0.045	*0.010*	0.045	*0.010*	**5.245**	*0.330*	**4.455**	*0.410*
18	0.035	*0.050*	0.035	*0.010*	**3.695**	*4.350*	**3.760**	*0.260*
25	0.065	*0.070*	0.040	*0.020*	**3.510**	*2.840*	**4.010**	*0.160*
35	0.105	*0.130*	0.070	*0.020*	**3.825**	*2.830*	**3.885**	*0.090*
136	0.285	*0.030*	0.345	*0.170*	**5.895**	*3.930*	**5.835**	*2.790*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-509. Selected metals in the surface water after inundation of the Point Sturt (South) soil material (Site 7): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.07	*0.07*	0.25	*0.10*	0.10	*0.13*	0.10	*0.08*	0.02	*<0.01*	0.03	*<0.01*
4	0.05	*0.04*	0.10	*0.03*	0.10	*0.13*	0.05	*0.08*	0.01	*<0.01*	0.21	*<0.01*
7	0.04	*0.04*	0.15	*0.07*	0.11	*0.12*	0.09	*0.03*	<0.01	-	0.27	*0.05*
11	0.03	*0.01*	0.22	*0.13*	0.08	*0.12*	0.03	*0.04*	<0.01	-	0.32	*0.10*
18	0.02	*0.03*	0.09	*0.03*	0.16	*0.23*	0.14	*0.16*	<0.01	-	0.39	*0.17*
25	0.03	*0.02*	0.05	*0.05*	0.17	*0.23*	0.11	*0.06*	<0.01	-	0.58	*0.35*
35	0.03	*0.02*	0.09	*<0.01*	0.10	*0.17*	0.10	*0.02*	<0.01	-	0.75	*0.52*
136	0.02	*0.02*	7.19	*14.25*	0.16	*0.15*	0.29	*0.14*	<0.01	-	0.90	*1.05*

Table 9-510. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	15.33	*0.61*	46.72	*31.22*	4.88	*6.07*	7.59	*8.77*	2.09	*0.59*	2.54	*2.00*
4	7.94	*5.71*	16.35	*18.44*	2.88	*4.83*	3.83	*6.31*	1.33	*0.80*	0.87	*0.89*
7	7.87	*9.05*	11.63	*16.16*	3.51	*6.11*	3.02	*5.50*	1.61	*1.69*	0.97	*1.14*
11	4.73	*6.54*	10.37	*16.11*	2.26	*4.12*	2.83	*5.43*	1.13	*1.36*	1.07	*1.20*
18	1.25	*2.29*	8.80	*16.64*	0.97	*1.68*	7.00	*13.82*	0.33	*0.62*	1.07	*1.50*
25	1.96	*3.67*	8.21	*16.15*	1.62	*2.24*	11.12	*21.99*	0.45	*0.84*	1.23	*1.58*
35	1.99	*3.50*	3.13	*6.18*	3.24	*3.11*	8.57	*16.94*	0.53	*0.92*	0.94	*1.07*
136	2.14	*3.20*	7.09	*13.90*	84.26	*160.43*	25.14	*37.80*	1.19	*1.82*	1.00	*1.27*

Table 9-511. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	67.92	*0.39*	45.68	*28.74*	39.89	*37.83*	15.44	*3.65*	**7.66**	*1.86*	4.98	*1.47*
4	62.72	*0.72*	51.46	*2.77*	50.47	*57.99*	19.16	*3.83*	**7.70**	*2.32*	3.90	*1.13*
7	54.95	*1.29*	45.29	*4.09*	53.03	*56.37*	19.28	*3.58*	**6.69**	*1.59*	3.59	*1.50*
11	53.48	*11.98*	48.50	*15.45*	79.62	*97.04*	28.54	*1.75*	**7.74**	*3.94*	3.70	*0.16*
18	27.79	*45.19*	25.01	*5.35*	84.12	*154.58*	31.31	*14.65*	**4.38**	*6.79*	2.11	*0.91*
25	23.96	*33.82*	19.31	*1.79*	95.59	*155.56*	43.90	*8.52*	**3.76**	*4.98*	1.96	*0.42*
35	20.07	*25.81*	11.40	*3.04*	136.43	*188.72*	60.24	*11.59*	**4.28**	*5.27*	1.84	*0.76*
136	9.01	*12.26*	7.77	*7.29*	331.55	*347.87*	185.70	*20.93*	**3.86**	*4.43*	1.84	*0.62*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-512. Selected metalloids and metals in the surface water after inundation of the Point Sturt (South) soil material (Site 7): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.29	*0.05*	<15.0	-	1.51	*0.45*	<1.0	-	2.39	*1.15*	<5.0	-
4	1.73	*0.08*	18.12	*5.78*	1.08	*0.20*	1.29	*0.48*	2.15	*0.31*	13.65	*0.15*
7	<1.0	-	<15.0	-	2.58	*1.06*	5.05	*0.06*	2.87	*0.73*	16.35	*2.43*
11	1.37	*0.28*	<15.0	-	2.08	*0.92*	3.67	*0.40*	2.08	*0.26*	19.65	*5.92*
18	<1.0	-	19.98	*2.74*	2.66	*1.08*	3.70	*0.22*	1.21	*0.27*	21.43	*9.05*
25	<1.0	-	29.01	*5.36*	2.34	*1.16*	4.66	*2.52*	1.94	*0.28*	28.97	*19.12*
35	1.39	*0.31*	<15.0	-	1.90	*0.47*	7.08	*4.14*	1.66	*0.03*	33.85	*28.43*
136	2.15	*0.36*	35.64	*0.76*	<1.0	-	**17.63**	*18.61*	1.89	*0.49*	51.68	*59.01*

Table 9-513. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	2.91	*2.47*	<15.0	-	**18.19**	*7.61*	**24.54**	*13.86*	**152.81**	*19.54*	185.09	*122.68*
4	1.77	*0.37*	<15.0	-	11.72	*9.28*	**20.95**	*17.86*	**102.01**	*53.19*	54.36	*65.34*
7	2.03	*1.12*	<15.0	-	**17.42**	*18.18*	**23.39**	*23.81*	**127.23**	*120.24*	54.02	*77.78*
11	1.61	*0.07*	<15.0	-	12.21	*13.37*	**24.43**	*28.62*	78.55	*86.01*	60.90	*80.19*
18	<1.0	-	23.88	*2.01*	7.94	*4.02*	**28.40**	*42.23*	23.58	*43.44*	56.28	*93.10*
25	<1.0	-	31.33	*8.52*	8.34	*13.09*	**32.82**	*56.12*	34.13	*63.46*	55.52	*92.89*
35	1.67	*1.62*	<15.0	-	11.62	*18.27*	**20.65**	*33.62*	33.49	*57.60*	36.36	*62.73*
136	3.17	*5.26*	40.19	*13.75*	6.97	*5.56*	**15.84**	*13.39*	66.40	*99.19*	62.53	*61.35*

Table 9-514. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	6.30	*2.83*	<15.0	-	**90.79**	*60.84*	**40.13**	*0.89*	**512.53**	*24.12*	345.26	*49.80*
4	4.21	*4.48*	<15.0	-	**102.68**	*74.95*	**51.82**	*1.86*	**532.68**	*39.81*	261.95	*48.65*
7	5.36	*2.27*	<15.0	-	**111.54**	*64.30*	**68.01**	*0.66*	**488.60**	*15.23*	221.52	*77.07*
11	5.60	*5.73*	<15.0	-	**142.93**	*98.26*	**95.12**	*41.08*	**503.34**	*134.37*	228.33	*7.54*
18	4.93	*8.33*	21.32	*0.76*	**87.75**	*131.99*	**74.01**	*8.03*	**279.58**	*407.79*	123.37	*49.75*
25	4.00	*7.36*	29.66	*3.44*	**73.01**	*83.96*	**71.12**	*29.99*	**269.05**	*312.80*	108.13	*20.97*
35	10.06	*14.57*	<15.0	-	**47.74**	*28.78*	**55.52**	*21.80*	**251.20**	*260.80*	93.62	*41.68*
136	44.91	*26.79*	55.93	*3.52*	1.14	*2.28*	**14.25**	*1.77*	**213.99**	*219.33*	102.64	*33.66*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-515. Selected metals in the surface water after inundation of the Point Sturt (South) soil material (Site 7): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	24.94	*8.89*	**43.49**	*47.45*	0.10	*<0.1*	<0.1	-	<1.0	-	<1.0	-
4	52.07	*10.30*	39.63	*15.80*	<0.1	-	0.27	*0.13*	<1.0	-	8.08	*0.28*
7	57.58	*23.12*	**80.37**	*70.21*	0.12	*<0.1*	0.24	*<0.1*	<1.0	-	10.26	*2.53*
11	25.74	*7.14*	35.78	*4.17*	0.13	*<0.1*	0.30	*0.16*	<1.0	-	12.21	*3.24*
18	n.a.	-	n.a.	-	<0.1	-	0.47	*0.17*	<1.0	-	15.93	*7.15*
25	12.70	*13.71*	38.97	*26.73*	<0.1	-	0.33	*0.34*	<1.0	-	21.65	*12.10*
35	43.60	*18.34*	**96.38**	*0.49*	<0.1	-	0.56	*0.37*	<1.0	-	29.73	*22.03*
136	9.21	*2.04*	**79.75**	*113.70*	<0.1	-	0.55	*0.44*	<1.0	-	40.32	*50.87*

Table 9-516. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**263.32**	*80.44*	**208.66**	*83.06*	1.88	*0.20*	2.03	*0.66*	98.01	*23.38*	116.80	*91.12*
4	**292.47**	*115.89*	**179.42**	*26.99*	1.09	*0.52*	0.62	*0.66*	59.36	*35.82*	37.26	*43.81*
7	**173.55**	*13.70*	**167.60**	*59.96*	1.26	*0.94*	0.54	*0.59*	74.27	*74.26*	39.42	*52.25*
11	**178.45**	*32.18*	**170.64**	*75.84*	0.79	*0.84*	0.83	*0.52*	50.24	*59.56*	45.19	*57.05*
18	n.a.	-	n.a.	-	0.28	*0.44*	0.59	*0.68*	14.61	*26.92*	47.77	*73.63*
25	99.60	*62.37*	**168.56**	*198.95*	0.34	*0.64*	0.77	*0.85*	21.21	*39.69*	49.40	*72.94*
35	**205.08**	*46.29*	**194.71**	*84.46*	0.28	*0.53*	0.65	*0.61*	23.24	*40.45*	37.54	*50.92*
136	**274.89**	*253.72*	**151.90**	*147.51*	0.50	*0.76*	0.68	*0.32*	56.65	*83.30*	48.14	*64.84*

Table 9-517. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**411.78**	*122.17*	**254.76**	*36.12*	**5.17**	*0.17*	3.37	*0.95*	353.09	*68.94*	**228.06**	*52.39*
4	**487.22**	*284.58*	**299.30**	*52.32*	**4.61**	*1.01*	2.23	*0.62*	344.73	*49.64*	**168.12**	*44.69*
7	**413.65**	*207.13*	**319.44**	*21.60*	4.23	*0.33*	1.98	*1.44*	310.59	*41.66*	**154.63**	*62.84*
11	**550.40**	*88.49*	**348.97**	*51.99*	4.33	*1.59*	1.94	*0.32*	352.30	*131.53*	**160.32**	*3.79*
18	n.a.	-	n.a.	-	2.67	*4.23*	1.33	*0.27*	192.53	*288.28*	99.46	*38.96*
25	**388.74**	*371.86*	**281.02**	*26.37*	2.43	*3.53*	1.13	*0.11*	184.58	*229.01*	89.96	*20.68*
35	**501.74**	*380.49*	**431.81**	*216.66*	2.35	*2.73*	1.05	*0.20*	195.67	*212.82*	84.14	*28.45*
136	**595.35**	*417.82*	**275.66**	*51.83*	1.43	*1.49*	0.92	*0.27*	180.52	*183.63*	95.74	*33.04*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-518. Selected metals in the surface water after inundation of the Point Sturt (South) soil material (Site 7): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.55	*1.43*	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	2.23	*0.27*	<4.4	-	<1.0	-	<1.0	-
11	2.05	*0.19*	<4.4	-	<1.0	-	<1.0	-
18	2.13	*0.78*	<4.4	-	<1.0	-	<1.0	-
25	2.89	*1.72*	<4.4	-	<1.0	-	<1.0	-
35	1.50	*0.16*	<4.4	-	<1.0	-	<1.0	-
136	<1.0	-	6.68	*5.32*	<1.0	-	1.42	*<1.0*

Table 9-519. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	22.98	*0.01*	63.16	*52.18*	<1.0	-	1.30	*<1.0*
4	10.20	*7.52*	17.00	*21.06*	1.34	*1.66*	1.89	*1.60*
7	13.33	*14.43*	13.72	*20.21*	<1.0	-	1.38	*1.41*
11	9.52	*11.13*	13.59	*21.20*	<1.0	-	1.08	*<1.0*
18	4.36	*3.26*	13.09	*20.56*	1.21	*<1.0*	<1.0	-
25	5.11	*5.78*	13.93	*21.46*	<1.0	-	<1.0	-
35	3.76	*3.74*	<4.4	-	<1.0	-	<1.0	-
136	1.85	*1.58*	7.75	*4.64*	<1.0	-	1.12	*1.30*

Table 9-520. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	**92.85**	*4.66*	63.68	*27.73*	1.44	*2.18*	<1.0	-
4	**86.06**	*0.37*	63.24	*2.73*	2.07	*2.61*	2.21	*<1.0*
7	**76.67**	*0.89*	59.37	*4.19*	1.01	*<1.0*	2.61	*<1.0*
11	**83.20**	*23.62*	61.53	*18.44*	<1.0	-	2.74	*1.35*
18	**41.19**	*61.30*	33.43	*5.02*	1.11	*<1.0*	3.07	*2.14*
25	33.83	*44.96*	28.28	*0.71*	<1.0	-	2.20	*1.71*
35	28.15	*34.59*	15.32	*2.55*	<1.0	-	2.46	*<1.0*
136	6.81	*6.75*	6.67	*1.12*	3.11	*4.62*	6.45	*1.65*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-521. Major cations in the surface water after inundation of the Point Sturt (South) soil material (Site 7): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	103	*3*	9803	*185*	4.5	*0.6*	327.4	*11.0*	18.7	*0.4*	419.4	*25.5*
4	111	*0*	9736	*329*	4.5	*0.1*	376.5	*0.1*	23.0	*0.8*	469.8	*2.6*
7	96	*12*	10067	*477*	4.7	*0.7*	345.6	*16.9*	22.9	*1.4*	449.9	*24.5*
11	101	*11*	10039	*305*	4.2	*0.5*	340.4	*4.4*	22.5	*2.1*	420.9	*7.1*
18	109	*1*	9618	*359*	4.5	*0.4*	359.1	*12.3*	20.3	*0.7*	415.1	*25.9*
25	115	*2*	9439	*267*	4.4	*0.1*	373.5	*18.1*	19.7	*0.3*	440.8	*4.0*
35	121	*5*	9499	*314*	4.1	*<0.1*	379.2	*7.7*	20.3	*0.2*	458.0	*12.9*
136	191	*82*	12381	*272*	8.1	*2.4*	447.6	*12.9*	28.2	*3.2*	478.4	*2.1*

Table 9-522. Major cations in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	469	*124*	4005	*573*	22.5	*9.2*	123.5	*37.3*	94.9	*36.9*	255.6	*5.8*
4	361	*181*	8483	*1345*	17.5	*8.4*	303.6	*71.3*	61.0	*8.5*	427.2	*45.1*
7	433	*376*	8968	*1843*	23.3	*21.1*	294.8	*71.6*	74.1	*41.4*	419.2	*61.2*
11	292	*232*	10201	*4158*	14.9	*12.2*	325.8	*128.4*	45.6	*32.1*	459.3	*137.6*
18	179	*136*	8516	*1607*	8.0	*7.8*	303.3	*84.2*	20.0	*5.6*	383.2	*30.3*
25	222	*222*	9282	*2861*	9.0	*9.7*	345.8	*117.3*	22.6	*12.1*	448.4	*123.0*
35	229	*209*	9019	*5*	8.2	*7.1*	332.2	*23.4*	25.8	*10.6*	429.3	*35.5*
136	376	*393*	12070	*458*	19.1	*18.8*	428.7	*28.3*	44.1	*30.2*	472.3	*6.9*

Table 9-523. Major cations in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1337	*453*	1676	*1472*	41.6	*8.5*	55.4	*25.2*	170.1	*14.4*	159.0	*89.5*
4	1308	*274*	5527	*489*	40.2	*6.6*	177.9	*16.6*	177.0	*14.3*	331.6	*36.0*
7	1132	*220*	6022	*406*	36.0	*4.2*	183.7	*14.0*	165.3	*7.6*	350.4	*0.4*
11	1193	*485*	8506	*3496*	37.3	*12.0*	252.6	*81.0*	166.6	*43.7*	438.7	*199.9*
18	767	*1020*	7347	*98*	23.3	*25.0*	244.7	*9.4*	86.9	*122.0*	382.0	*21.6*
25	792	*844*	8303	*820*	23.7	*19.8*	288.4	*14.2*	85.2	*96.0*	436.6	*84.1*
35	738	*651*	7769	*435*	22.5	*17.6*	282.6	*26.1*	87.2	*84.2*	405.7	*38.3*
136	642	*606*	10835	*660*	37.0	*31.0*	384.3	*25.9*	81.5	*74.2*	440.1	*5.8*

Table 9-524. Major cations and anions in the surface water after inundation of the Point Sturt (South) soil material (Site 7): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	12.0	*0.4*	1205.7	*4.7*	136	*2*	19657	*14*	112	*13*	2902	*39*
4	13.9	*0.4*	1306.9	*30.8*	173	*4*	19417	*739*	78	*3*	2924	*109*
7	11.1	*2.0*	1339.2	*76.8*	201	*16*	21937	*1144*	111	*11*	2871	*100*
11	10.3	*1.9*	1359.1	*63.9*	195	*17*	20507	*801*	81	*8*	2748	*151*
18	14.5	*0.3*	1196.9	*14.5*	183	*10*	18363	*140*	83	*32*	2748	*<1*
25	15.4	*1.3*	1150.8	*52.7*	179	*<1*	19919	*553*	78	*25*	2712	*38*
35	16.1	*0.7*	1166.4	*15.2*	190	*11*	20179	*5*	65	*14*	3047	*177*
136	24.0	*6.3*	1421.7	*16.1*	270	*80*	22391	*268*	98	*29*	3457	*99*

Table 9-525. Major cations and anions in the pore-water (3-5 cm) after inundation of the Point Sturt (South) soil material (Site 7): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	72.9	*21.0*	491.8	*48.7*	847	*259*	7426	*1323*	741	*28*	1666	*202*
4	50.2	*29.7*	1155.6	*188.9*	632	*319*	16777	*2714*	419	*177*	2757	*123*
7	52.2	*51.0*	1189.6	*232.7*	841	*796*	19383	*3816*	609	*544*	2719	*125*
11	31.4	*33.5*	1485.7	*635.2*	558	*436*	20222	*6383*	350	*309*	2728	*59*
18	20.0	*15.3*	1080.7	*208.0*	277	*188*	16435	*3675*	143	*125*	2701	*83*
25	26.4	*27.6*	1214.7	*353.8*	338	*331*	18568	*4687*	186	*233*	2743	*200*
35	29.4	*25.8*	1087.0	*24.2*	373	*302*	19069	*309*	165	*195*	2956	*152*
136	61.2	*71.1*	1403.3	*66.0*	458	*409*	21792	*968*	510	*625*	3463	*17*

Table 9-526. Major cations and anions in the pore-water (10-12 cm) after inundation of the Point Sturt (South) soil material (Site 7): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	277.9	*72.2*	270.1	*189.0*	2197	*620*	2859	*2684*	2244	*693*	1625	*536*
4	290.7	*72.9*	782.0	*94.7*	2216	*610*	10257	*1291*	2252	*585*	2502	*406*
7	230.2	*39.2*	841.2	*40.9*	2000	*316*	13056	*631*	2246	*407*	2490	*102*
11	231.6	*107.2*	1275.8	*634.2*	2089	*776*	16459	*5062*	2192	*1007*	2555	*203*
18	170.3	*261.2*	1017.0	*70.4*	1179	*1591*	14074	*106*	1309	*1974*	2786	*96*
25	174.8	*228.0*	1135.7	*236.0*	1133	*1199*	16388	*533*	1301	*1638*	2750	*298*
35	175.4	*204.2*	1030.1	*55.1*	1145	*1079*	16823	*1583*	1315	*1520*	2979	*291*
136	155.1	*173.6*	1287.2	*32.2*	713	*720*	19540	*1140*	1492	*1480*	3319	*102*

Table 9-527. Selected surface water properties after inundation of the Point Sturt (North) soil material (Site 8): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.97	0.22	5.95	0.20	591	61	640	6	2.1	-	3.6	0.1
4	6.77	0.07	5.99	0.13	514	47	621	6	1.8	0.1	2.2	0.1
7	6.05	0.34	5.88	0.12	590	40	516	132	2.0	0.1	2.5	0.5
11	6.40	0.43	5.43	0.31	524	296	457	22	1.8	0.1	1.8	0.4
18	6.53	0.03	5.72	0.66	472	56	425	40	0.9	<0.1	0.7	0.4
25	6.18	0.04	6.22	0.04	370	206	411	192	1.4	0.1	0.9	0.3
35	5.89	0.06	6.42	0.20	380	98	455	48	1.4	<0.1	1.2	0.2
136	6.26	0.39	4.43	0.99	404	32	382	282	0.5	0.3	0.1	0.2

Table 9-528. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	2.69	0.03	4.06	2.65	802	0	728	185	0.0	0.0	1.8	3.5
4	3.01	0.11	4.67	3.20	773	13	636	137	0.0	0.0	1.1	2.2
7	2.96	0.04	4.84	2.51	774	17	537	84	0.0	0.0	1.7	1.5
11	3.09	0.01	4.89	1.81	711	76	437	62	0.0	0.0	1.2	0.8
18	3.30	0.20	5.12	0.60	573	45	397	179	0.0	0.0	0.6	0.1
25	3.53	0.26	5.85	1.22	488	23	358	214	0.0	0.0	0.9	0.2
35	3.56	0.19	5.70	1.18	454	19	310	91	0.1	0.1	1.2	0.1
136	4.61	0.83	4.52	1.09	381	70	488	86	0.4	0.3	0.8	0.7

Table 9-529. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	2.52	0.03	2.54	0.05	814	1	823	3	0.0	0.0	0.0	0.0
4	2.56	<0.01	2.49	0.08	782	15	777	20	0.0	0.0	0.0	0.0
7	2.56	0.03	2.57	0.09	747	10	742	29	0.0	0.0	0.0	0.0
11	2.58	0.03	2.66	0.04	701	18	655	46	0.0	0.0	0.0	0.0
18	2.71	<0.01	2.81	<0.01	627	1	589	65	0.0	0.0	0.0	0.0
25	2.74	0.02	2.90	0.02	595	9	561	12	0.0	0.0	0.0	0.0
35	2.82	0.06	3.15	0.11	570	16	536	26	0.0	0.0	0.0	0.0
136	3.62	0.34	4.93	0.57	438	27	278	42	0.0	0.0	1.5	0.3

Table 9-530. Selected surface water properties after inundation of the Point Sturt (North) soil material (Site 8): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.50	-	<0.2	-	<0.2	7.60	<0.2	-	n.a.	-	3.7	-
4	<0.2	-	<0.2	-	0.58	<0.2	<0.2	-				
7	0.43	0.85	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.3	-	5.5	-
18	0.55	<0.2	1.26	0.69	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	74.0	-	5.9	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.3	0.3	4.9	0.7

Table 9-531. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.58	0.45	1.53	2.85	4.28	1.15	5.80	11.60	22.0	-	4.7	-
4	0.60	0.60	2.28	3.55	2.50	1.50	2.63	5.25				
7	0.40	0.30	20.00	40.00	0.90	0.50	<0.2	-				
11	1.88	2.95	25.90	51.80	1.15	<0.2	8.14	15.93	15.0	-	5.7	-
18	36.24	40.02	48.93	95.71	<0.2	-	<0.2	-				
25	84.33	58.25	44.51	88.84	0.53	1.05	0.40	0.75				
35	139.99	40.48	89.41	178.17	5.53	11.07	3.62	7.00	27.0	-	6.6	-
136	181.05	93.07	157.67	307.49	12.24	24.49	<0.2	-	51.0	26.0	21.5	33.0

Table 9-532. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	4.20	1.30	3.73	0.25	15.88	9.35	19.28	2.65	26.0	-	22.0	-
4	3.25	1.10	3.15	2.00	17.65	8.30	18.23	13.65				
7	5.20	4.00	15.10	22.60	15.70	10.40	3.00	6.00				
11	10.60	9.00	42.48	50.85	18.46	12.79	15.92	2.90	22.0	-	12.0	-
18	58.58	4.14	124.86	122.22	3.54	<0.2	0.32	<0.2				
25	92.38	11.80	150.33	122.37	14.28	19.57	2.18	2.96				
35	161.51	20.67	219.54	17.27	4.05	5.15	7.65	15.29	6.3	-	20.0	-
136	370.25	50.27	590.22	75.00	<0.2	-	<0.2	-	36.5	3.0	34.5	7.0

Table 9-533. Selected nutrients in the surface water after inundation of the Point Sturt (North) soil material (Site 8): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.048	-	0.021	*0.019*	0.032	-	0.035	*0.010*
4	0.075	*0.010*	0.028	*0.045*	0.015	*0.010*	<0.005	-
7	0.150	*0.060*	0.040	*0.020*	0.025	*0.010*	0.010	*<0.005*
11	0.415	*0.130*	0.030	*0.020*	0.040	*0.020*	<0.005	-
18	0.645	*0.050*	0.045	*0.010*	0.010	*0.020*	0.015	*0.010*
25	0.795	*0.070*	0.080	*0.040*	<0.005	-	<0.005	-
35	0.830	*0.020*	0.045	*0.010*	<0.005	-	0.015	*0.010*
136	1.265	*0.650*	0.015	*0.030*	0.005	*0.010*	0.005	*0.010*

Table 9-534. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.090	*0.019*	0.040	*0.080*	0.031	*<0.005*	0.040	*<0.005*
4	0.094	*0.007*	0.005	*0.010*	0.007	*0.007*	0.005	*0.010*
7	0.085	*0.050*	0.035	*0.030*	0.010	*<0.005*	0.010	*<0.005*
11	0.115	*0.150*	0.030	*0.020*	<0.005	-	<0.005	-
18	0.055	*0.090*	0.030	*0.020*	0.010	*<0.005*	0.015	*0.010*
25	0.095	*0.030*	0.110	*0.060*	0.005	*0.010*	0.005	*0.010*
35	0.100	*0.040*	0.115	*0.110*	0.005	*0.010*	0.025	*0.010*
136	0.155	*0.170*	0.110	*0.220*	0.015	*0.010*	0.050	*0.100*

Table 9-535. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.075	*0.010*	0.095	*0.010*	0.040	*<0.005*	0.040	*<0.005*
4	0.045	*0.010*	0.045	*0.030*	0.025	*0.010*	0.045	*0.050*
7	0.065	*0.010*	0.075	*0.070*	0.020	*<0.005*	0.015	*0.010*
11	0.060	*0.040*	0.025	*0.010*	<0.005	-	<0.005	-
18	0.030	*<0.005*	0.030	*0.020*	0.005	*0.010*	0.015	*0.010*
25	0.075	*0.010*	0.100	*0.000*	<0.005	-	<0.005	-
35	0.080	*0.020*	0.210	*0.280*	<0.005	-	0.005	*0.010*
136	0.065	*0.010*	0.280	*0.020*	0.010	*<0.005*	0.020	*0.040*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-536. Selected nutrients in the surface water after inundation of the Point Sturt (North) soil material (Site 8): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.010	-	0.010	*<0.005*	0.240	-	0.045	*0.030*
4	0.055	*0.010*	0.070	*<0.005*	0.210	*0.040*	1.095	*0.250*
7	0.010	*<0.005*	0.020	*0.020*	0.695	*0.030*	1.585	*0.490*
11	0.020	*<0.005*	0.020	*<0.005*	0.145	*0.070*	**2.240**	*0.460*
18	0.020	*0.020*	0.015	*0.010*	0.180	*0.080*	**2.315**	*0.310*
25	0.015	*0.010*	0.010	*0.020*	0.075	*0.010*	**3.245**	*0.690*
35	0.030	*0.020*	0.015	*0.010*	0.070	*<0.005*	**2.770**	*0.060*
136	0.035	*0.030*	0.020	*0.020*	0.330	*0.020*	**4.350**	*0.160*

Table 9-537. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.030	*<0.005*	0.020	*0.020*	**5.660**	*0.520*	**3.700**	*7.080*
4	0.030	*0.060*	0.065	*0.010*	**3.455**	*2.050*	**2.780**	*3.180*
7	0.010	*<0.005*	0.015	*0.030*	**3.740**	*1.300*	**3.120**	*2.480*
11	0.020	*0.020*	0.355	*0.670*	**3.350**	*0.720*	**4.650**	*4.460*
18	0.180	*0.240*	0.210	*0.400*	**3.005**	*1.130*	**4.015**	*2.910*
25	1.360	*1.140*	0.140	*0.240*	**3.300**	*0.400*	**4.480**	*2.920*
35	1.740	*0.320*	0.080	*0.140*	**3.560**	*0.200*	**4.480**	*3.360*
136	0.495	*0.030*	0.095	*0.130*	**4.055**	*0.710*	**6.470**	*4.220*

Table 9-538. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.025	*0.010*	0.025	*0.010*	**9.675**	*1.350*	**9.395**	*1.850*
4	0.041	*0.079*	0.090	*0.000*	**8.745**	*1.510*	**8.520**	*2.840*
7	0.015	*0.010*	0.030	*0.020*	**8.965**	*1.870*	**7.580**	*1.940*
11	0.020	*<0.005*	0.070	*0.060*	**8.595**	*1.970*	**8.600**	*2.220*
18	0.045	*0.030*	0.195	*0.210*	**7.760**	*0.260*	**7.175**	*1.510*
25	0.085	*0.050*	0.460	*0.440*	**7.500**	*0.660*	**7.530**	*1.220*
35	0.125	*0.110*	0.640	*0.860*	**7.755**	*0.550*	**7.410**	*1.220*
136	0.680	*0.600*	0.545	*0.870*	**9.340**	*0.740*	**12.710**	*1.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-539. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 8): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.05	-	0.07	*0.03*	0.11	-	0.10	*0.08*	0.01	-	0.03	*<0.01*
4	0.04	*0.02*	0.07	*<0.01*	0.08	*0.05*	0.07	*0.01*	0.01	*<0.01*	0.54	*0.06*
7	0.02	*0.02*	0.12	*0.07*	0.07	*0.03*	0.10	*<0.01*	<0.01	-	0.82	*0.17*
11	0.01	*<0.01*	0.08	*0.07*	0.08	*0.04*	0.23	*0.29*	<0.01	-	1.22	*0.22*
18	0.02	*0.01*	0.06	*0.06*	0.11	*0.04*	0.79	*0.72*	<0.01	-	0.87	*0.15*
25	0.04	*<0.01*	0.02	*0.02*	0.17	*0.18*	0.33	*0.33*	<0.01	-	1.24	*0.41*
35	0.01	*<0.01*	0.06	*<0.01*	0.05	*0.08*	0.16	*0.24*	<0.01	-	1.03	*0.13*
136	<0.01	-	4.85	*0.37*	0.16	*0.14*	0.48	*0.44*	<0.01	-	0.97	*0.04*

Table 9-540. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	14.34	*9.78*	12.58	*25.05*	7.49	*1.36*	6.42	*12.77*	**3.91**	*1.56*	1.69	*3.28*
4	6.72	*10.36*	4.91	*9.78*	2.36	*1.89*	4.62	*9.17*	2.09	*2.50*	1.09	*1.10*
7	4.10	*5.36*	2.56	*4.90*	1.80	*0.72*	9.07	*17.96*	1.57	*1.49*	0.91	*0.05*
11	3.15	*3.27*	3.97	*7.81*	3.42	*3.65*	45.11	*89.53*	1.46	*0.99*	1.58	*1.00*
18	1.04	*0.21*	0.44	*0.71*	34.71	*35.62*	41.71	*82.26*	0.71	*0.28*	1.05	*0.13*
25	0.87	*0.05*	0.28	*0.55*	77.65	*58.62*	60.40	*120.62*	0.65	*0.18*	1.37	*0.06*
35	0.65	*0.06*	0.17	*0.32*	133.87	*48.59*	77.47	*154.13*	0.85	*0.24*	1.19	*0.29*
136	0.13	*0.05*	2.61	*4.88*	165.57	*80.62*	124.98	*241.90*	1.09	*0.45*	1.11	*0.19*

Table 9-541. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	25.67	*20.97*	24.76	*2.29*	19.89	*8.74*	22.95	*0.90*	**7.50**	*3.94*	5.43	*0.44*
4	24.02	*18.96*	29.25	*16.44*	20.07	*8.50*	22.84	*16.02*	**7.28**	*4.10*	4.14	*2.21*
7	20.86	*15.97*	27.03	*17.03*	20.03	*10.63*	20.18	*14.80*	**6.26**	*3.49*	3.30	*1.55*
11	20.33	*19.32*	26.94	*10.75*	29.45	*21.96*	79.42	*81.82*	**6.92**	*5.02*	3.34	*0.66*
18	11.66	*6.54*	13.24	*4.56*	60.60	*3.55*	113.17	*104.62*	**5.07**	*1.24*	2.02	*0.47*
25	10.23	*6.83*	10.63	*1.60*	92.40	*8.90*	168.29	*47.56*	**4.30**	*1.56*	2.20	*0.05*
35	7.13	*4.76*	4.50	*2.85*	142.56	*23.46*	189.76	*19.75*	**4.77**	*0.93*	1.88	*0.18*
136	1.24	*1.42*	0.04	*0.04*	356.00	*52.62*	534.52	*110.34*	**4.07**	*1.73*	1.38	*0.19*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-542. Selected metalloids and metals in the surface water after inundation of the Point Sturt (North) soil material (Site 8): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	0.83	-	<15.0	-	1.37	-	1.78	*0.13*	1.37	-	<5.0	-
4	1.62	*1.05*	<15.0	-	2.25	*2.11*	3.16	*0.91*	2.07	*0.98*	10.98	*1.25*
7	1.79	*0.67*	<15.0	-	4.27	*0.97*	**8.28**	*1.05*	3.05	*0.16*	16.54	*4.19*
11	2.43	*0.82*	<15.0	-	2.87	*0.83*	**8.58**	*0.30*	2.13	*0.43*	25.52	*4.45*
18	1.18	*0.63*	<15.0	-	2.96	*2.39*	5.28	*0.85*	1.99	*0.78*	17.51	*5.87*
25	<1.0	-	29.53	*6.54*	3.23	*0.76*	5.73	*2.24*	2.15	*0.80*	25.90	*11.89*
35	1.61	*0.87*	<15.0	-	2.84	*1.11*	3.71	*0.38*	1.68	*0.81*	14.13	*2.31*
136	1.59	*0.75*	34.95	*4.58*	1.79	*0.02*	**16.77**	*6.46*	2.37	*0.34*	15.76	*2.60*

Table 9-543. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	3.32	*0.74*	<15.0	-	**28.17**	*1.09*	**22.87**	*40.54*	85.76	*22.11*	38.02	*73.79*
4	2.83	*0.56*	<15.0	-	**14.06**	*8.83*	**11.10**	*19.24*	45.97	*50.32*	21.02	*20.92*
7	2.11	*0.53*	<15.0	-	12.43	*6.56*	**8.54**	*5.27*	37.10	*36.84*	14.82	*2.81*
11	4.45	*3.94*	67.60	*130.85*	**13.45**	*2.80*	**11.05**	*8.29*	32.66	*19.95*	24.23	*2.91*
18	39.98	*19.37*	84.90	*146.45*	11.96	*0.18*	4.19	*2.05*	15.54	*5.54*	13.89	*11.86*
25	92.18	*32.42*	106.13	*136.68*	7.30	*1.30*	5.13	*0.48*	14.71	*3.06*	18.05	*17.38*
35	202.06	*205.86*	70.20	*135.54*	6.22	*2.26*	2.96	*0.27*	14.58	*4.36*	11.20	*9.76*
136	143.59	*35.01*	87.14	*111.45*	1.73	*1.51*	7.71	*2.35*	13.46	*2.35*	9.41	*18.37*

Table 9-544. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	4.17	*0.34*	<15.0	-	**51.06**	*35.96*	**44.93**	*13.78*	**150.16**	*62.05*	117.53	*8.92*
4	3.95	*1.78*	<15.0	-	**50.74**	*41.04*	**46.29**	*33.02*	**146.35**	*79.35*	81.79	*43.42*
7	3.83	*0.04*	<15.0	-	**59.11**	*52.02*	**48.28**	*27.82*	**136.22**	*63.91*	60.37	*30.53*
11	5.08	*0.54*	21.89	*14.88*	**62.76**	*62.70*	**64.52**	*12.57*	**137.21**	*78.87*	57.42	*8.25*
18	10.67	*1.63*	88.32	*103.22*	**50.81**	*31.48*	**30.72**	*6.27*	**104.65**	*15.69*	32.59	*5.97*
25	12.82	*8.15*	179.73	*182.21*	**41.65**	*29.37*	**22.01**	*0.10*	**97.27**	*33.13*	33.96	*1.33*
35	33.50	*26.72*	195.80	*263.03*	**28.32**	*16.39*	**10.46**	*2.17*	85.15	*10.47*	24.00	*2.43*
136	**563.31**	*216.34*	270.09	*247.76*	1.42	*2.32*	**11.69**	*0.22*	63.58	*22.72*	<5.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-545. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 8): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	23.20	-	20.96	3.13	<0.1	-	0.40	0.35	<1.0	-	<1.0	-
4	63.65	33.13	**82.79**	27.19	0.32	0.53	0.57	0.29	<1.0	-	6.96	1.66
7	58.46	22.44	**48.20**	1.93	0.48	<0.1	0.39	<0.1	1.45	0.24	10.40	2.20
11	28.46	1.62	**47.18**	10.63	0.19	0.21	0.47	0.19	<1.0	-	15.01	2.94
18	n.a.	-	n.a.	-	0.36	0.26	0.46	0.13	<1.0	-	11.57	2.97
25	11.92	4.60	39.71	5.96	0.42	0.72	0.43	0.10	<1.0	-	14.53	5.04
35	46.42	11.25	**45.31**	6.59	0.12	0.24	0.37	0.11	<1.0	-	12.25	1.38
136	18.97	12.65	**54.89**	6.43	0.17	0.17	0.25	<0.1	<1.0	-	12.26	1.18

Table 9-546. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**270.79**	82.50	**197.91**	302.46	0.68	0.11	0.50	0.57	52.13	16.13	25.07	48.42
4	**478.35**	34.47	**145.03**	155.61	0.40	0.23	0.30	0.22	27.52	30.48	13.64	14.96
7	**288.72**	150.87	**209.62**	220.14	0.30	0.19	0.24	0.18	21.40	19.65	10.04	0.17
11	**273.92**	100.95	**300.32**	256.15	0.20	<0.1	0.26	0.10	20.48	12.86	17.68	10.01
18	n.a.	-	n.a.	-	0.21	<0.1	0.13	<0.1	9.66	3.73	11.33	2.61
25	**219.28**	66.75	**85.16**	50.49	0.11	<0.1	0.17	0.29	9.21	3.36	13.03	3.15
35	**348.27**	142.59	**184.22**	82.42	<0.1	-	0.19	0.12	10.89	3.28	12.50	1.14
136	154.58	22.32	**95.26**	21.94	0.23	0.22	0.25	<0.1	12.63	0.08	11.88	0.26

Table 9-547. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**231.30**	36.52	**274.23**	2.81	0.61	0.26	0.72	<0.1	82.97	29.45	71.49	5.96
4	**393.89**	51.26	**235.04**	18.57	0.46	<0.1	0.35	0.14	82.90	33.29	51.88	28.19
7	**245.95**	110.95	**234.61**	109.42	0.34	<0.1	0.29	<0.1	80.61	32.37	39.58	19.12
11	**335.28**	170.32	**318.69**	46.71	0.57	0.29	0.39	<0.1	82.83	47.07	39.75	7.30
18	n.a.	-	n.a.	-	0.55	0.44	0.22	0.12	61.63	5.61	25.57	4.63
25	**260.00**	65.58	**275.62**	9.96	0.28	<0.1	0.13	<0.1	57.13	12.12	26.30	0.50
35	**476.84**	148.48	**331.09**	7.50	0.50	0.58	0.45	0.17	53.47	1.34	23.51	2.94
136	**336.34**	55.40	**95.79**	34.57	0.20	0.22	0.14	<0.1	47.86	9.28	11.45	5.11

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-548. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 8): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<1.0	-	<4.4	-	<1.0	-	1.29	2.58
4	1.99	2.03	<4.4	-	1.35	2.63	1.63	2.94
7	3.91	1.34	<4.4	-	2.49	<1.0	1.12	1.77
11	2.73	0.64	<4.4	-	<1.0	-	<1.0	-
18	2.11	2.52	<4.4	-	1.55	1.33	1.41	1.37
25	2.83	1.39	<4.4	-	<1.0	-	1.07	2.13
35	1.82	1.86	<4.4	-	<1.0	-	<1.0	-
136	1.09	0.14	4.65	3.03			1.12	<1.0

Table 9-549. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	24.13	2.56	18.74	37.49	<1.0	-	<1.0	-
4	8.47	6.04	5.47	10.94	2.16	2.10	<1.0	-
7	6.60	4.70	<4.4	-	1.37	1.10	<1.0	-
11	6.54	2.08	5.67	8.04	<1.0	-	<1.0	-
18	3.27	0.38	<4.4	-	1.79	2.16	<1.0	-
25	3.82	0.25	<4.4	-	<1.0	-	<1.0	-
35	4.05	0.38	<4.4	-	<1.0	-	<1.0	-
136	1.96	1.48	<4.4	-	1.40	<1.0	1.37	1.04

Table 9-550. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	36.97	9.29	47.64	19.93	<1.0	-	<1.0	-
4	29.96	13.16	33.04	10.35	<1.0	-	<1.0	-
7	27.80	13.21	30.17	14.12	<1.0	-	1.20	1.20
11	28.07	19.13	29.85	3.65	1.59	2.17	1.56	<1.0
18	17.59	4.15	17.64	0.52	3.20	-	2.13	1.08
25	14.55	4.07	16.33	2.72	<1.0	-	2.16	<1.0
35	12.35	2.20	8.55	2.03	2.09	3.39	3.97	<1.0
136	3.30	1.63	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-551. Major cations in the surface water after inundation of the Point Sturt (North) soil material (Site 8): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	95	-	11262	*1568*	3.9	-	364.5	*31.1*	19.0	-	469.3	*68.2*
4	107	*3*	9590	*230*	4.2	*<0.1*	363.0	*4.8*	24.6	*0.6*	465.2	*15.3*
7	94	*6*	9681	*284*	4.1	*0.3*	329.8	*7.4*	24.1	*0.8*	447.7	*23.9*
11	111	*2*	12359	*756*	4.3	*0.1*	404.1	*33.3*	27.3	*1.2*	552.2	*32.0*
18	108	*18*	9106	*477*	4.0	*0.6*	331.5	*15.0*	24.0	*2.4*	406.8	*5.1*
25	110	*3*	10181	*1150*	4.2	*0.3*	385.5	*34.7*	21.9	*2.3*	545.7	*112.8*
35	110	*7*	9127	*129*	4.2	*<0.1*	353.7	*35.1*	22.7	*0.2*	442.0	*10.1*
136	140	*16*	12370	*351*	9.8	*1.5*	447.8	*32.5*	30.7	*0.4*	487.3	*27.8*

Table 9-552. Major cations in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	141	*23*	8082	*5424*	1.7	*0.7*	257.4	*178.8*	169.0	*23.4*	420.0	*36.5*
4	135	*21*	8885	*1722*	2.2	*<0.1*	336.1	*79.3*	98.4	*103.5*	456.2	*43.5*
7	115	*25*	6734	*5061*	2.1	*0.1*	234.4	*178.1*	77.5	*67.1*	330.2	*234.9*
11	130	*0*	10790	*2264*	2.4	*0.1*	355.5	*58.0*	68.8	*32.8*	487.6	*133.7*
18	113	*21*	8748	*666*	2.9	*0.4*	318.0	*30.1*	37.7	*9.6*	405.0	*3.4*
25	115	*2*	9476	*1668*	5.4	*1.8*	364.6	*47.1*	33.5	*5.1*	497.9	*106.1*
35	124	*7*	8449	*47*	8.7	*1.4*	323.6	*11.1*	38.6	*9.4*	420.9	*3.2*
136	145	*12*	11335	*1775*	18.2	*8.1*	410.1	*56.0*	41.2	*1.8*	469.6	*20.3*

Table 9-553. Major cations in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	190	*104*	1088	*1434*	1.3	*0.7*	25.2	*41.4*	155.6	*21.1*	208.2	*40.9*
4	209	*94*	5732	*2882*	1.3	*0.7*	182.1	*102.5*	165.4	*29.7*	385.5	*88.3*
7	180	*90*	6826	*1199*	1.4	*0.3*	209.0	*37.3*	159.2	*53.7*	392.1	*7.3*
11	189	*106*	9993	*1000*	1.3	*0.7*	293.5	*35.3*	157.9	*58.7*	502.6	*27.0*
18	158	*45*	7748	*644*	1.5	*0.5*	254.6	*26.6*	116.4	*8.3*	403.4	*3.0*
25	172	*57*	7956	*1375*	2.6	*0.8*	279.9	*56.3*	102.1	*14.9*	428.8	*64.2*
35	166	*34*	7865	*422*	4.3	*0.2*	282.5	*21.1*	90.5	*7.7*	402.6	*11.2*
136	157	*30*	9890	*1079*	21.7	*6.0*	374.5	*65.7*	78.2	*10.0*	406.5	*8.2*

Table 9-554. Major cations and anions in the surface water after inundation of the Point Sturt (North) soil material (Site 8): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	12.6	-	1373.4	*210.4*	136	-	21544	*2039*	40	-	3254	*592*
4	14.1	*0.3*	1250.0	*62.6*	146	*6*	18925	*1012*	71	*2*	2843	*76*
7	11.4	*0.8*	1266.7	*32.7*	194	*12*	20725	*1562*	67	*58*	2773	*9*
11	12.8	*0.4*	1737.8	*72.8*	191	*2*	24897	*2909*	67	*20*	3446	*184*
18	15.5	*3.4*	1122.6	*54.9*	165	*2*	17345	*473*	55	*25*	2663	*144*
25	15.1	*0.3*	1337.0	*213.0*	161	*7*	19973	*800*	73	*3*	2984	*374*
35	15.8	*0.5*	1104.0	*17.7*	164	*10*	19393	*395*	67	*11*	2945	*60*
136	21.2	*1.6*	1417.6	*112.7*	203	*26*	22496	*1576*	122	*20*	3453	*214*

Table 9-555. Major cations and anions in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	44.9	*16.1*	980.5	*615.0*	198	*40*	15464	*10643*	831	*131*	2666	*615*
4	28.9	*26.4*	1180.4	*241.1*	198	*25*	17234	*4122*	472	*484*	2785	*189*
7	19.2	*15.1*	884.9	*687.0*	207	*7*	14755	*10869*	450	*431*	2027	*1372*
11	17.8	*5.8*	1507.9	*307.5*	192	*12*	22013	*4706*	378	*119*	3066	*782*
18	13.7	*4.4*	1095.4	*77.0*	163	*17*	16861	*1887*	245	*98*	2650	*143*
25	15.3	*5.1*	1224.6	*241.9*	164	*12*	18901	*1938*	338	*124*	2839	*369*
35	18.1	*4.3*	1037.6	*35.9*	180	*20*	17712	*215*	419	*154*	2855	*141*
136	24.9	*4.1*	1338.5	*108.3*	201	*6*	21333	*1259*	470	*114*	3289	*229*

Table 9-556. Major cations and anions in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	85.3	*50.5*	174.2	*165.8*	221	*105*	1944	*2655*	1187	*389*	1437	*331*
4	93.6	*43.2*	771.0	*364.8*	257	*82*	10935	*5854*	1204	*437*	2355	*658*
7	68.7	*42.1*	916.1	*184.9*	257	*92*	15101	*2417*	1243	*744*	2443	*349*
11	66.7	*44.9*	1413.5	*196.0*	253	*107*	20701	*2351*	1172	*720*	3253	*295*
18	59.3	*13.8*	983.8	*74.7*	195	*87*	14739	*765*	845	*176*	2581	*<1*
25	63.4	*23.5*	1018.4	*242.5*	182	*68*	16014	*2554*	917	*294*	2590	*268*
35	57.4	*16.0*	961.3	*67.0*	196	*4*	16258	*1132*	924	*164*	2817	*19*
136	54.1	*17.0*	1153.0	*29.1*	180	*11*	18768	*257*	1026	*159*	3275	*282*

Table 9-557. Selected surface water properties after inundation of the Point Sturt (North) soil material (Site 9): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.96	*0.48*	5.84	*0.44*	583	*105*	570	*25*	2.1	*0.2*	3.7	*<0.1*
4	6.86	*0.33*	6.65	*1.01*	497	*62*	531	*88*	1.9	*0.1*	3.1	*0.1*
7	6.62	*0.13*	7.18	*0.47*	540	*42*	492	*66*	2.3	*0.1*	3.9	*<0.1*
11	6.48	*0.81*	6.61	*1.04*	410	*1*	313	*34*	2.1	*0.1*	3.6	*0.1*
18	6.69	*0.57*	6.97	*1.02*	324	*19*	267	*30*	1.3	*0.1*	3.0	*0.0*
25	6.75	*0.65*	7.92	*0.22*	314	*5*	241	*30*	1.9	*0.1*	3.5	*0.8*
35	6.39	*0.72*	7.84	*0.18*	339	*25*	315	*144*	2.1	*<0.1*	3.4	*0.1*
136	7.47	*0.68*	7.10	*1.30*	321	*35*	184	*6*	2.3	*<0.1*	3.7	*0.1*

Table 9-558. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.03	*0.59*	5.85	*0.72*	536	*26*	574	*24*	2.0	*<0.1*	2.4	*0.3*
4	6.84	*0.21*	6.77	*0.31*	498	*54*	529	*57*	2.2	*0.1*	2.8	*0.2*
7	6.47	*0.34*	6.91	*0.31*	445	*179*	479	*38*	2.7	*<0.1*	3.9	*0.3*
11	6.54	*0.49*	6.68	*0.51*	417	*9*	332	*23*	2.7	*0.1*	3.7	*<0.1*
18	6.59	*0.69*	6.91	*0.40*	297	*99*	267	*44*	1.8	*0.2*	3.5	*0.2*
25	6.82	*0.41*	7.12	*0.05*	241	*102*	194	*22*	3.0	*0.7*	4.0	*0.3*
35	6.57	*0.40*	6.91	*0.08*	258	*4*	143	*53*	3.0	*0.9*	4.3	*0.2*
136	7.25	*0.11*	7.03	*0.22*	303	*39*	118	*1*	3.4	*0.7*	4.3	*<0.1*

Table 9-559. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.96	*0.41*	6.21	*1.40*	528	*30*	555	*41*	1.8	*<0.1*	1.8	*0.4*
4	6.92	*0.04*	6.65	*0.03*	471	*25*	503	*36*	2.2	*0.1*	2.3	*0.8*
7	6.67	*0.18*	6.85	*0.04*	445	*220*	470	*35*	3.1	*<0.1*	3.7	*0.5*
11	6.62	*0.36*	6.72	*0.15*	413	*3*	340	*21*	3.5	*0.1*	3.9	*0.7*
18	6.81	*0.18*	6.85	*0.03*	288	*17*	288	*23*	2.5	*0.1*	3.7	*0.7*
25	7.00	*0.22*	6.91	*0.38*	286	*38*	274	*33*	4.5	*0.2*	3.8	*1.0*
35	6.73	*0.21*	7.01	*0.45*	346	*20*	240	*38*	4.4	*0.2*	4.5	*0.3*
136	7.38	*0.03*	7.01	*0.10*	289	*32*	159	*1*	5.1	*0.8*	4.3	*0.1*

Table 9-560. Selected surface water properties after inundation of the Point Sturt (North) soil material (Site 9): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.50	*0.30*	<0.2	-	<0.2	-	7.8	-	3.6	-
4	<0.2	-	<0.2	-	0.33	*0.65*	<0.2	-				
7	0.63	*1.25*	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	5.7	-	3.0	-
18	0.55	*<0.2*	0.54	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.5	-	3.2	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.7	*0.6*	3.3	*0.6*

Table 9-561. Selected pore-water properties (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.40	*<0.2*	0.28	*<0.2*	<0.2	-	8.8	-	5.3	-
4	<0.2	-	<0.2	-	0.33	*0.65*	<0.2	-				
7	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
11	0.75	*1.50*	<0.2	-	<0.2	-	<0.2	-	6.2	-	4.3	-
18	0.64	*<0.2*	0.59	*<0.2*	<0.2	-	<0.2	-				
25	0.41	*0.67*	1.01	*0.80*	<0.2	-	<0.2	-				
35	0.67	*0.68*	7.91	*11.13*	0.64	*0.74*	0.38	*0.59*	7.5	-	5.8	-
136	0.38	*<0.2*	5.36	*0.56*	<0.2	-	0.86	*<0.2*	8.0	*1.1*	4.8	*0.3*

Table 9-562. Selected pore-water properties (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.33	*<0.2*	<0.2	-	<0.2	-	11.0	-	6.9	-
4	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
7	<0.2	-	0.25	*0.40*	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.9	-	4.6	-
18	0.56	*<0.2*	0.55	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.9	-	5.1	-
136	0.20	*<0.2*	1.10	*<0.2*	<0.2	-	<0.2	-	7.4	*0.2*	5.1	*0.7*

Table 9-563. Selected nutrients in the surface water after inundation of the Point Sturt (North) soil material (Site 9): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.090	*0.040*	0.025	*0.030*	0.030	*<0.005*	0.025	*0.010*
4	0.145	*0.050*	0.755	*0.170*	0.010	*<0.005*	0.025	*0.010*
7	0.245	*0.050*	0.790	*0.140*	0.005	*0.010*	0.030	*<0.005*
11	0.320	*0.040*	1.025	*0.010*	<0.005	-	0.015	*0.010*
18	0.430	*0.020*	0.900	*0.360*	0.015	*0.010*	0.045	*0.010*
25	0.540	*0.020*	0.980	*0.060*	<0.005	-	0.050	*<0.005*
35	0.470	*0.040*	1.065	*0.030*	<0.005	-	0.040	*0.020*
136	0.835	*0.170*	2.455	*0.050*	0.015	*0.010*	<0.005	-

Table 9-564. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	1.734	*0.033*	5.980	*0.340*	0.037	*0.007*	0.040	*<0.005*
4	2.390	*0.640*	1.797	*0.234*	0.030	*0.020*	0.060	*0.060*
7	1.780	*0.160*	2.070	*0.120*	0.025	*0.010*	0.185	*0.090*
11	1.150	*0.020*	1.850	*1.460*	0.040	*0.000*	0.035	*0.030*
18	0.235	*0.210*	0.250	*0.240*	0.070	*0.100*	0.040	*0.080*
25	0.180	*0.100*	0.205	*0.270*	0.010	*<0.005*	<0.005	-
35	0.100	*0.080*	0.180	*0.260*	0.035	*0.030*	0.010	*0.020*
136	0.165	*0.130*	0.140	*0.200*	0.020	*<0.005*	0.030	*0.020*

Table 9-565. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	5.914	*0.428*	6.495	*0.830*	0.031	*<0.005*	0.045	*0.010*
4	5.570	*0.560*	2.625	*1.210*	0.090	*0.020*	0.010	*<0.005*
7	5.535	*0.350*	2.195	*0.510*	0.075	*0.090*	0.015	*0.010*
11	5.790	*0.460*	3.025	*0.270*	0.015	*0.010*	0.010	*<0.005*
18	4.185	*0.630*	2.665	*0.830*	0.110	*0.080*	0.060	*0.060*
25	2.465	*1.130*	3.010	*2.520*	0.130	*0.040*	0.025	*0.010*
35	1.065	*0.730*	1.750	*1.360*	0.125	*0.090*	0.010	*<0.005*
136	0.100	*0.080*	0.110	*0.100*	0.010	*<0.005*	0.030	*0.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-566. Selected nutrients in the surface water after inundation of the Point Sturt (North) soil material (Site 9): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.013	*0.015*	0.100	*0.180*	0.200	*0.020*	0.025	*0.010*
4	0.060	*<0.005*	0.070	*0.020*	0.050	*<0.005*	0.100	*0.020*
7	0.010	*<0.005*	0.015	*0.010*	0.440	*0.020*	0.165	*0.010*
11	0.020	*<0.005*	0.040	*0.020*	0.085	*0.010*	0.350	*0.040*
18	0.035	*0.010*	0.055	*0.030*	0.505	*0.730*	0.265	*0.010*
25	0.035	*0.030*	0.050	*<0.005*	0.075	*0.010*	0.520	*0.040*
35	0.040	*0.020*	0.050	*<0.005*	0.070	*<0.005*	0.185	*0.010*
136	0.075	*0.010*	0.060	*<0.005*	0.310	*<0.005*	0.065	*0.030*

Table 9-567. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.070	*0.040*	0.140	*0.080*	0.200	*<0.005*	0.200	*0.220*
4	0.120	*0.040*	0.145	*0.070*	0.050	*0.000*	0.415	*0.430*
7	0.050	*0.040*	0.060	*0.020*	0.425	*0.010*	0.265	*0.290*
11	0.065	*0.050*	0.120	*0.020*	0.120	*0.020*	0.395	*0.290*
18	0.060	*0.040*	0.115	*0.030*	0.745	*0.730*	0.895	*0.170*
25	0.035	*0.010*	0.085	*0.030*	0.435	*0.170*	1.440	*0.220*
35	0.010	*<0.005*	0.035	*0.010*	0.445	*0.210*	**1.895**	*1.470*
136	0.010	*<0.005*	0.055	*0.010*	0.505	*0.290*	0.610	*0.060*

Table 9-568. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.115	*0.030*	0.130	*0.140*	0.265	*0.190*	0.055	*0.070*
4	0.135	*0.050*	0.095	*0.030*	0.045	*0.010*	0.290	*0.020*
7	0.055	*0.010*	0.045	*0.030*	0.445	*0.070*	0.400	*0.100*
11	0.080	*0.020*	0.130	*0.140*	0.090	*0.060*	0.460	*0.220*
18	0.065	*0.030*	0.085	*0.070*	0.225	*0.070*	0.165	*0.130*
25	0.075	*0.010*	0.110	*0.080*	0.250	*0.020*	0.405	*0.090*
35	0.065	*0.010*	0.085	*0.070*	0.375	*0.090*	0.260	*0.300*
136	0.090	*0.100*	0.060	*0.060*	0.620	*0.160*	0.435	*0.110*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-569. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 9): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.01*	0.01	*0.03*	0.03	*0.06*	0.11	*0.12*	<0.01	-	<0.01	-
4	0.03	*0.02*	0.02	*0.02*	0.06	*0.05*	0.07	*0.12*	<0.01	-	<0.01	-
7	0.03	*<0.01*	0.03	*0.02*	0.03	*<0.01*	0.15	*0.09*	<0.01	-	<0.01	-
11	0.03	*0.05*	0.01	*0.02*	0.02	*0.05*	0.11	*0.13*	<0.01	-	<0.01	-
18	0.02	*<0.01*	0.01	*0.01*	0.10	*0.11*	0.22	*0.34*	<0.01	-	<0.01	-
25	0.02	*<0.01*	<0.01	-	0.09	*0.15*	0.18	*0.28*	<0.01	-	<0.01	-
35	0.02	*<0.01*	0.01	*<0.01*	0.04	*0.08*	0.12	*0.15*	<0.01	-	<0.01	-
136	<0.01	-	0.01	*0.02*	0.07	*0.10*	0.20	*0.23*	<0.01	-	<0.01	-

Table 9-570. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.08	*0.07*	0.04	*0.05*	0.10	*0.08*	0.09	*0.05*	<0.01	-	<0.01	-
4	0.08	*0.10*	0.04	*0.06*	0.13	*0.13*	0.09	*0.10*	<0.01	-	<0.01	-
7	0.09	*0.09*	0.07	*0.07*	0.09	*0.05*	0.13	*0.07*	0.03	*<0.01*	0.01	*<0.01*
11	0.11	*0.07*	0.04	*0.05*	0.11	*0.09*	0.08	*0.08*	0.05	*0.03*	0.08	*0.10*
18	0.08	*0.09*	0.06	*0.09*	0.24	*0.29*	0.25	*0.12*	0.28	*0.17*	0.67	*0.67*
25	0.05	*0.04*	0.02	*0.04*	0.53	*0.88*	1.15	*0.73*	0.54	*0.40*	1.81	*0.33*
35	0.05	*0.07*	0.03	*0.05*	1.19	*1.27*	6.94	*9.57*	0.64	*0.65*	2.59	*0.37*
136	0.03	*0.05*	0.02	*0.03*	0.54	*0.44*	5.61	*0.53*	0.54	*0.81*	1.02	*0.18*

Table 9-571. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.06	*0.05*	0.04	*<0.01*	0.03	*0.04*	0.04	*0.02*	<0.01	-	<0.01	-
4	0.05	*0.02*	0.01	*0.01*	0.07	*0.04*	0.01	*0.03*	<0.01	-	0.01	*0.03*
7	0.10	*0.03*	0.03	*0.02*	0.04	*0.05*	0.06	*<0.01*	0.02	*0.03*	0.01	*0.02*
11	0.07	*0.06*	0.02	*0.01*	0.04	*0.05*	0.07	*0.06*	0.05	*0.08*	0.01	*<0.01*
18	0.02	*0.02*	0.03	*<0.01*	0.03	*<0.01*	0.09	*0.05*	0.13	*0.20*	0.02	*<0.01*
25	0.01	*<0.01*	<0.01	-	0.07	*0.07*	0.08	*0.03*	0.19	*0.28*	0.05	*0.05*
35	0.02	*0.01*	0.01	*0.01*	0.13	*0.08*	0.10	*0.04*	0.25	*0.35*	0.28	*0.47*
136	<0.01	-	0.01	*0.02*	0.14	*0.05*	1.23	*0.08*	0.92	*0.77*	1.89	*0.18*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-572. Selected metalloids and metals in the surface water after inundation of the Point Sturt (North) soil material (Site 9): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.11	*0.06*	<15.0	-	1.01	*0.38*	1.65	*0.56*	1.36	*0.08*	<5.0	-
4	<1.0	-	<15.0	-	2.25	*3.12*	1.76	*2.08*	1.35	*0.24*	<5.0	-
7	1.06	*0.83*	<15.0	-	1.40	*0.63*	3.71	*0.15*	1.65	*0.27*	<5.0	-
11	1.62	*0.04*	<15.0	-	1.26	*0.25*	3.17	*0.65*	1.51	*0.05*	5.04	*3.32*
18	1.22	*0.30*	18.92	*3.03*	2.74	*0.61*	1.35	*0.05*	1.36	*0.11*	<5.0	-
25	<1.0	-	35.70	*1.23*	1.86	*0.95*	1.01	*0.72*	1.76	*0.19*	<5.0	-
35	<1.0	-	<15.0	-	2.64	*0.38*	2.38	*1.32*	1.48	*0.35*	<5.0	-
136	1.88	*1.90*	45.06	*7.75*	1.03	*0.24*	6.03	*3.24*	1.89	*0.24*	<5.0	-

Table 9-573. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.82	*0.59*	<15.0	-	2.21	*0.62*	3.56	*0.23*	2.48	*0.29*	8.72	*4.49*
4	<1.0	-	15.75	*1.49*	2.41	*0.55*	1.47	*0.13*	2.51	*0.07*	9.00	*2.05*
7	1.89	*0.24*	<15.0	-	3.80	*1.43*	3.96	*0.40*	3.13	*0.20*	9.09	*1.19*
11	1.77	*0.61*	<15.0	-	3.40	*1.09*	3.44	*1.52*	3.27	*0.61*	9.54	*3.13*
18	3.38	*0.73*	20.01	*0.20*	2.18	*0.47*	3.68	*3.18*	3.08	*0.73*	8.01	*2.74*
25	3.08	*2.44*	40.07	*9.36*	2.53	*1.32*	1.41	*0.52*	3.81	*1.57*	9.75	*4.48*
35	4.38	*3.12*	<15.0	-	2.30	*0.01*	1.54	*0.53*	3.87	*1.30*	<5.0	-
136	5.02	*4.52*	49.29	*10.42*	<1.0	-	6.76	*1.43*	3.19	*1.32*	5.42	*5.01*

Table 9-574. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	3.38	*0.55*	<15.0	-	2.84	*0.47*	4.12	*3.12*	2.59	*0.72*	5.44	*1.71*
4	2.22	*0.24*	<15.0	-	2.78	*0.13*	1.50	*0.33*	2.49	*0.14*	17.93	*10.90*
7	2.08	*0.03*	<15.0	-	3.06	*0.25*	5.41	*0.64*	2.91	*0.06*	18.20	*11.63*
11	2.16	*0.23*	<15.0	-	3.36	*1.39*	7.54	*4.50*	3.22	*0.37*	17.29	*14.89*
18	2.15	*0.09*	16.77	*4.57*	2.89	*1.05*	4.85	*1.25*	2.79	*0.08*	7.85	-
25	2.47	*1.26*	38.55	*0.72*	3.50	*1.92*	3.67	*1.70*	3.89	*0.68*	13.62	*10.63*
35	2.26	*0.76*	<15.0	-	3.72	*1.13*	3.74	*0.02*	4.96	*2.58*	7.48	*7.04*
136	7.16	*8.07*	52.58	*4.52*	<1.0	-	7.18	*0.86*	4.89	*0.58*	9.66	*6.21*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-575. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 9): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	4.44	*0.95*	18.58	*0.96*	<0.1	-	0.11	*0.15*	<1.0	-	<1.0	-
4	26.13	-	29.22	*5.49*	<0.1	-	0.20	*<0.1*	<1.0	-	<1.0	-
7	33.93	*24.36*	41.71	*11.36*	<0.1	-	0.10	*<0.1*	<1.0	-	<1.0	-
11	32.13	*12.05*	22.68	*3.49*	0.11	*<0.1*	0.21	*<0.1*	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	0.11	*0.12*	<1.0	-	<1.0	-
25	7.19	*3.26*	13.30	-	0.16	*0.12*	0.16	*0.11*	<1.0	-	<1.0	-
35	64.46	*40.19*	**55.31**	*8.15*	<0.1	-	0.22	*<0.1*	<1.0	-	<1.0	-
136	8.63	*1.81*	<5.0	-	<0.1	-	0.13	*<0.1*	<1.0	-	<1.0	-

Table 9-576. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	45.67	*17.72*	**49.59**	*4.98*	0.13	*0.11*	0.28	*0.34*	<1.0	-	<1.0	-
4	118.62	*6.29*	41.98	-	<0.1	-	0.37	*0.20*	<1.0	-	<1.0	-
7	99.42	*84.37*	**51.46**	*0.49*	0.11	*0.13*	0.34	*0.26*	<1.0	-	<1.0	-
11	113.56	*20.65*	**102.97**	-	0.17	*0.15*	0.40	*0.50*	<1.0	-	1.05	*0.32*
18	n.a.	-	n.a.	-	0.14	*0.21*	0.33	*0.13*	2.65	*1.49*	7.81	*0.48*
25	23.55	*2.59*	33.96	*6.19*	<0.1	-	0.17	*0.31*	3.55	*1.70*	17.47	*4.37*
35	90.65	*53.05*	**83.65**	*47.26*	<0.1	-	0.22	*0.21*	3.53	*0.65*	22.40	*17.05*
136	10.33	*5.56*	<5.0	-	<0.1	-	0.12	*<0.1*	1.83	*1.13*	6.26	*7.51*

Table 9-577. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	16.14	*10.72*	35.21	*5.84*	0.11	*<0.1*	<0.1	-	<1.0	-	<1.0	-
4	94.46	*30.52*	**50.13**	-	<0.1	-	0.65	*0.11*	<1.0	-	<1.0	-
7	58.25	*7.89*	**59.32**	*25.24*	<0.1	-	0.61	*0.27*	<1.0	-	<1.0	-
11	125.62	*12.57*	**146.41**	-	<0.1	-	0.58	*0.48*	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	0.10	*<0.1*	0.64	*0.16*	1.08	*0.35*	<1.0	-
25	26.80	*12.00*	35.30	*0.92*	0.27	*0.53*	0.51	*0.46*	1.94	*0.09*	<1.0	-
35	**170.71**	*130.38*	**113.77**	*35.84*	<0.1	-	0.47	*0.17*	1.87	*1.13*	1.55	*0.75*
136	8.19	*1.24*	<5.0	-	<0.1	-	0.21	*0.15*	2.25	*0.41*	21.22	*24.37*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-578. Selected metals in the surface water after inundation of the Point Sturt (North) soil material (Site 9): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.12	*0.15*	<4.4	-	<1.0	-	<1.0	-
11	1.28	*0.71*	<4.4	-	<1.0	-	<1.0	-
18	1.11	*0.73*	<4.4	-	<1.0	-	<1.0	-
25	1.48	*0.51*	<4.4	-	<1.0	-	<1.0	-
35	2.60	*0.05*	<4.4	-	<1.0	-	<1.0	-
136	<1.0	-	<4.4	-	<1.0	-	<1.0	-

Table 9-579. Selected metals in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	2.07	*4.13*	1.68	*3.36*
4	<1.0	-	<4.4	-	2.77	*5.35*	2.04	*3.77*
7	1.24	*0.31*	<4.4	-	2.63	*4.08*	2.03	*3.58*
11	1.35	*1.29*	<4.4	-	2.80	*5.27*	1.87	*2.96*
18	1.24	*0.12*	<4.4	-	3.34	*6.21*	3.16	*4.69*
25	1.69	*0.74*	<4.4	-	1.85	*3.43*	1.41	*2.72*
35	2.23	*0.39*	<4.4	-	1.99	*3.98*	1.75	*3.49*
136	<1.0	-	<4.4	-	1.58	*2.42*	1.62	*1.39*

Table 9-580. Selected metals in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	<1.0	-	<4.4	-	<1.0	-	<1.0	-
11	1.02	*0.03*	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	1.01	*<1.0*	1.20	*<1.0*
25	2.01	*1.74*	<4.4	-	1.49	*1.83*	<1.0	-
35	2.80	*0.62*	<4.4	-	<1.0	-	<1.0	-
136	1.32	*0.65*	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-581. Major cations in the surface water after inundation of the Point Sturt (North) soil material (Site 9): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	96	6	10454	127	3.9	0.2	348.5	9.2	19.3	0.6	431.8	1.0
4	116	2	9643	18	4.5	0.2	372.2	2.7	22.6	<0.1	477.9	37.9
7	103	11	9771	22	4.4	0.3	332.1	1.3	24.5	2.7	449.9	20.3
11	100	12	9724	-	4.1	0.5	330.8	-	23.0	2.5	434.4	-
18	95	2	9184	249	3.9	<0.1	339.3	4.5	21.8	<0.1	414.1	5.9
25	103	8	8949	475	4.2	0.3	349.0	0.6	21.3	1.8	436.7	5.6
35	114	4	9115	598	4.3	0.2	355.8	15.7	21.6	0.8	434.4	9.5
136	133	4	10839	341	6.1	0.4	395.6	7.5	28.2	0.9	481.2	0.6

Table 9-582. Major cations in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	93	10	6193	4025	5.3	1.2	190.7	120.4	34.3	2.1	392.8	205.8
4	110	11	8635	247	6.9	0.5	321.9	12.7	43.9	0.9	505.1	80.4
7	91	4	9352	8	6.2	0.4	303.8	1.5	40.5	0.6	480.7	7.3
11	96	10	9165	105	6.2	0.1	306.0	1.2	39.5	4.1	444.6	7.2
18	88	2	9239	230	5.7	0.7	334.5	7.4	36.5	4.3	449.0	17.0
25	96	7	8696	171	5.8	0.8	336.8	3.2	34.0	4.9	449.6	35.0
35	100	9	8938	230	5.4	0.9	340.4	2.5	33.9	6.0	451.4	20.5
136	118	22	11239	214	6.4	0.2	394.7	8.1	43.6	10.5	495.6	17.1

Table 9-583. Major cations in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	62	11	1585	2442	9.2	1.5	50.8	70.4	33.6	11.9	147.9	202.1
4	78	2	7533	1418	11.3	1.3	248.0	42.4	45.6	15.2	538.7	133.1
7	68	2	8863	1360	10.9	0.8	277.3	41.3	48.0	9.0	522.7	119.5
11	75	8	8949	865	11.1	1.1	283.1	22.6	52.9	0.8	468.8	53.7
18	68	3	9129	731	10.2	<0.1	315.4	21.9	51.4	4.9	472.6	71.0
25	76	4	8295	880	11.0	0.6	313.6	16.2	55.9	7.1	462.0	54.3
35	86	10	8670	532	10.2	0.8	332.3	6.1	51.6	4.9	478.3	53.8
136	98	20	11012	168	8.5	<0.1	391.5	9.4	66.9	3.4	498.2	6.3

Table 9-584. Major cations and anions in the surface water after inundation of the Point Sturt (North) soil material (Site 9): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	12.9	*<0.1*	1290.3	*5.1*	138	*1*	20418	*588*	49	*29*	2973	*98*
4	15.9	*1.0*	1294.3	*7.6*	168	*19*	18886	*40*	20	*3*	2801	*192*
7	12.8	*1.2*	1260.4	*13.2*	172	*6*	20564	*289*	38	*20*	2609	*72*
11	11.9	*1.5*	1369.1	-	166	*26*	19734	-	30	*6*	2681	-
18	13.6	*0.2*	1148.7	*5.4*	139	*9*	17741	*178*	40	*<1*	2627	*45*
25	14.3	*2.4*	1076.5	*38.9*	163	*34*	18720	*221*	44	*31*	2582	*6*
35	15.5	*0.3*	1104.7	*40.4*	175	*15*	19010	*754*	60	*5*	2776	*78*
136	21.0	*1.1*	1348.4	*16.0*	206	*16*	21439	*296*	47	*9*	2981	*23*

Table 9-585. Major cations and anions in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	14.9	*1.6*	790.6	*508.2*	198	*122*	12025	*8399*	75	*24*	1864	*1122*
4	20.2	*0.4*	1165.1	*14.4*	241	*141*	17018	*340*	60	*21*	2546	*15*
7	14.4	*0.1*	1192.4	*75.9*	231	*117*	19737	*86*	59	*<1*	2616	*124*
11	13.8	*1.1*	1279.0	*50.6*	221	*109*	19204	*177*	42	*19*	2569	*23*
18	16.0	*2.7*	1154.4	*13.3*	220	*175*	17702	*595*	47	*11*	2663	*57*
25	17.2	*0.3*	1084.9	*20.1*	232	*191*	18321	*680*	60	*39*	2531	*242*
35	17.5	*3.1*	1081.9	*70.7*	200	*82*	18853	*452*	52	*5*	2734	*177*
136	23.2	*2.6*	1374.9	*43.0*	237	*77*	21723	*144*	51	*14*	3020	*57*

Table 9-586. Major cations and anions in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	15.0	*6.9*	199.9	*316.4*	85	*85*	2930	*4421*	121	*18*	572	*741*
4	21.9	*5.9*	1041.0	*228.3*	126	*91*	15042	*2769*	113	*21*	2356	*328*
7	17.6	*3.3*	1148.6	*214.6*	120	*71*	19128	*2937*	99	*19*	2546	*241*
11	19.8	*0.2*	1216.6	*129.1*	134	*54*	18573	*1557*	93	*7*	2522	*148*
18	22.7	*2.2*	1135.3	*79.0*	124	*78*	17206	*934*	86	*15*	2613	*89*
25	23.9	*2.0*	1036.1	*71.7*	173	*47*	17465	*1158*	80	*12*	2422	*237*
35	25.9	*2.2*	1078.7	*98.0*	133	*27*	18350	*692*	97	*3*	2653	*209*
136	31.8	*1.9*	1342.5	*21.1*	173	*7*	21328	*615*	78	*2*	2950	*62*

Table 9-587. Selected surface water properties after inundation of the Milang soil material (Site 10): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.68	*0.78*	6.35	*0.27*	524	*41*	554	*25*	2.2	*<0.1*	3.4	*0.4*
4	6.67	*0.86*	6.60	*0.77*	436	*25*	401	*173*	1.9	*0.1*	2.7	*0.4*
7	6.44	*1.00*	6.84	*0.42*	283	*41*	384	*104*	2.3	*<0.1*	3.2	*0.5*
11	6.89	*0.24*	6.80	*0.44*	352	*124*	284	*132*	2.0	*0.1*	2.9	*0.4*
18	6.38	*0.85*	6.86	*0.43*	322	*124*	268	*69*	1.1	*<0.1*	2.1	*0.4*
25	7.16	*0.20*	7.16	*0.19*	225	*122*	260	*17*	1.7	*0.1*	2.3	*0.1*
35	6.88	*0.02*	7.11	*0.13*	208	*39*	258	*68*	1.9	*0.1*	3.0	*0.1*
136	7.35	*0.50*	7.11	*0.18*	238	*89*	187	*35*	1.7	*0.4*	2.2	*0.1*

Table 9-588. Selected pore-water properties (3-5 cm) after inundation of the Milang soil material (Site 10): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3.86	*0.17*	5.65	*0.04*	691	*53*	506	*206*	0.4	*0.3*	1.7	*0.7*
4	5.06	*1.59*	6.33	*0.09*	529	*167*	262	*35*	0.2	*0.3*	2.8	*0.1*
7	5.33	*2.17*	6.54	*0.19*	431	*277*	200	*13*	0.8	*0.7*	3.6	*0.4*
11	6.17	*0.41*	6.64	*0.32*	218	*59*	167	*3*	1.6	*0.1*	3.7	*0.2*
18	6.43	*0.22*	6.45	*0.04*	159	*25*	165	*10*	2.8	*1.3*	3.2	*0.7*
25	6.69	*0.14*	6.77	*0.32*	155	*31*	146	*7*	5.3	*3.9*	4.2	*1.2*
35	6.44	*0.02*	6.69	*0.26*	165	*18*	147	*14*	5.2	*2.1*	4.4	*1.5*
136	6.58	*0.15*	6.66	*0.06*	209	*47*	166	*9*	2.5	*<0.1*	3.2	*1.2*

Table 9-589. Selected pore-water properties (10-12 cm) after inundation of the Milang soil material (Site 10): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3.28	*0.06*	3.93	*0.46*	711	*30*	634	*138*	0.0	*0.0*	0.6	*0.1*
4	3.36	*0.15*	4.19	*1.07*	701	*31*	516	*206*	0.0	*0.0*	0.6	*0.7*
7	3.36	*0.15*	5.74	*0.46*	643	*22*	310	*156*	0.0	*0.0*	2.7	*2.7*
11	3.40	*0.11*	6.26	*0.13*	573	*21*	188	*53*	0.0	*0.0*	5.6	*3.7*
18	3.49	*0.05*	6.51	*0.01*	562	*7*	120	*3*	0.0	*0.0*	6.6	*1.5*
25	5.51	*1.65*	6.57	*0.06*	311	*270*	130	*10*	1.0	*0.6*	9.8	*1.4*
35	6.09	*0.06*	6.54	*0.18*	182	*14*	122	*13*	3.8	*1.2*	8.7	*1.3*
136	6.13	*0.19*	6.41	*0.15*	194	*5*	170	*7*	1.9	*1.0*	3.3	*1.1*

Table 9-590. Selected surface water properties after inundation of the Milang soil material (Site 10): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.33	*<0.2*	0.33	*<0.2*	<0.2	-	6.6	-	4.2	-
4	<0.2	-	0.53	*0.25*	<0.2	-	<0.2	-				
7	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.3	-	5.4	-
18	0.56	*<0.2*	0.59	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	20.0	-	7.2	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.6	*0.3*	6.2	*1.5*

Table 9-591. Selected pore-water properties (3-5 cm) after inundation of the Milang soil material (Site 10): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.43	*<0.2*	0.38	*<0.2*	<0.2	-	23.0	-	31.0	-
4	<0.2	-	5.13	*3.35*	<0.2	-	<0.2	-				
7	2.00	*2.40*	19.05	*9.90*	1.90	*1.80*	<0.2	-				
11	29.05	*12.90*	27.25	*23.10*	4.06	*2.69*	6.40	*3.71*	44.0	-	14.0	-
18	47.72	*47.42*	39.17	*49.32*	6.16	*0.77*	1.12	*0.94*				
25	32.48	*34.56*	30.20	*30.89*	7.74	*3.26*	1.16	*<0.2*				
35	29.88	*23.58*	22.09	*31.41*	5.74	*1.85*	1.21	*1.95*	15.0	-	11.0	-
136	7.05	*7.64*	13.02	*3.11*	0.82	*1.29*	<0.2	-	32.5	*19.0*	9.8	*2.4*

Table 9-592. Selected pore-water properties (10-12 cm) after inundation of the Milang soil material (Site 10): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1.73	*0.35*	19.68	*33.65*	1.03	*<0.2*	<0.2	-	28.0	-	34.0	-
4	1.58	*0.65*	27.78	*50.45*	1.30	*0.40*	<0.2	-				
7	2.85	*3.30*	93.00	*145.60*	3.25	*1.10*	<0.2	-				
11	17.55	*6.10*	145.40	*58.00*	5.12	*2.15*	12.61	*25.22*	20.0	-	77.0	-
18	53.22	*11.40*	188.39	*21.10*	<0.2	-	7.98	*1.19*				
25	152.63	*41.40*	89.67	*2.75*	2.33	*4.65*	0.65	*0.69*				
35	181.61	*50.67*	97.83	*26.37*	11.54	*6.99*	3.16	*1.62*	93.0	-	27.0	-
136	73.37	*50.27*	37.64	*51.90*	<0.2	-	<0.2	-	82.5	*11.0*	13.0	*4.0*

Table 9-593. Selected nutrients in the surface water after inundation of the Milang soil material (Site 10): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.079	*<0.005*	0.120	*0.080*	0.032	*<0.005*	0.030	*<0.005*
4	0.095	*0.030*	0.520	*0.600*	0.005	*0.010*	<0.005	-
7	0.155	*0.010*	0.530	*0.620*	0.040	*0.040*	0.025	*0.010*
11	0.780	*0.380*	0.595	*0.590*	0.330	*0.220*	0.035	*0.050*
18	1.375	*0.090*	0.645	*0.030*	0.015	*0.010*	0.370	*0.620*
25	1.530	*0.120*	3.130	*0.820*	<0.005	-	2.010	*0.740*
35	1.330	*0.440*	9.420	*0.720*	0.010	*<0.005*	3.750	*0.700*
136	2.075	*0.170*	9.745	*1.630*	0.010	*0.020*	0.005	*0.010*

Table 9-594. Selected nutrients in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	7.284	*5.508*	11.955	*22.510*	0.041	*0.018*	0.145	*0.170*
4	3.200	*2.920*	0.150	*0.120*	0.020	*<0.005*	0.020	*<0.005*
7	1.330	*2.260*	0.115	*0.050*	0.035	*0.010*	0.080	*0.040*
11	0.470	*0.260*	0.200	*0.000*	0.050	*0.100*	0.040	*0.020*
18	0.420	*0.500*	0.190	*0.080*	0.135	*0.130*	0.245	*0.290*
25	0.550	*0.480*	0.745	*0.010*	0.105	*0.130*	0.515	*0.010*
35	0.340	*0.020*	2.980	*0.160*	0.090	*0.100*	1.620	*0.360*
136	0.165	*0.330*	4.015	*2.190*	0.045	*0.030*	0.060	*0.020*

Table 9-595. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	9.695	*4.910*	6.086	*12.011*	0.045	*0.010*	0.075	*0.070*
4	9.220	*4.620*	0.580	*1.140*	0.015	*0.010*	0.015	*0.010*
7	9.255	*4.950*	0.130	*0.160*	0.020	*0.040*	0.070	*0.080*
11	7.320	*5.780*	0.155	*0.230*	0.035	*0.010*	0.075	*0.110*
18	2.830	*3.660*	0.045	*0.090*	0.150	*0.040*	0.355	*0.110*
25	0.610	*0.900*	0.190	*0.100*	0.025	*0.030*	0.335	*0.050*
35	0.625	*0.590*	0.290	*0.180*	0.205	*0.110*	0.065	*0.030*
136	1.150	*2.040*	0.335	*0.110*	0.045	*0.070*	0.030	*0.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-596. Selected nutrients in the surface water after inundation of the Milang soil material (Site 10): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.015	*0.010*	0.050	*0.020*	0.390	*0.120*	0.450	*0.540*
4	0.065	*0.030*	0.065	*0.010*	0.750	*0.100*	**4.030**	*1.280*
7	0.010	*0.020*	0.015	*0.010*	1.350	*0.040*	**4.405**	*1.290*
11	0.010	*<0.005*	0.020	*<0.005*	0.410	*0.440*	**5.220**	*1.220*
18	0.020	*0.020*	0.015	*0.010*	0.395	*0.170*	**4.775**	*0.190*
25	0.020	*0.020*	<0.005	-	0.085	*0.030*	**3.765**	*0.730*
35	0.025	*0.010*	0.005	*0.010*	0.075	*0.010*	0.160	*0.140*
136	0.050	*0.040*	0.015	*0.010*	0.315	*0.010*	0.055	*0.010*

Table 9-597. Selected nutrients in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.025	*0.010*	0.045	*0.030*	**27.105**	*4.030*	**19.833**	*26.125*
4	0.070	*<0.005*	0.105	*0.010*	**17.875**	*3.430*	**5.745**	*1.790*
7	0.025	*0.010*	0.215	*0.170*	**13.885**	*5.770*	**7.870**	*3.460*
11	0.200	*0.180*	0.115	*0.030*	**14.740**	*8.820*	**10.230**	*3.380*
18	0.135	*0.010*	0.285	*0.290*	**18.585**	*13.190*	**10.880**	*7.580*
25	0.120	*0.080*	0.335	*0.310*	**14.970**	*11.880*	**12.675**	*9.070*
35	0.200	*0.020*	0.280	*0.040*	**14.420**	*9.020*	**8.355**	*9.350*
136	0.765	*0.710*	0.130	*0.040*	**7.705**	*4.930*	**4.595**	*3.590*

Table 9-598. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.035	*0.010*	0.045	*0.030*	**34.070**	*2.500*	**31.946**	*0.518*
4	0.090	*<0.005*	0.080	*0.020*	**36.050**	*1.700*	**12.030**	*6.000*
7	0.020	*0.020*	0.085	*0.130*	**35.650**	*1.700*	**16.925**	*13.670*
11	0.040	*<0.005*	0.165	*0.230*	**33.420**	*0.800*	**26.710**	*19.220*
18	0.030	*<0.005*	0.410	*0.060*	**33.185**	*7.030*	**35.000**	*13.000*
25	0.030	*<0.005*	0.615	*0.030*	**36.250**	*0.300*	**34.065**	*8.870*
35	0.150	*0.060*	0.115	*0.010*	**37.350**	*3.700*	**27.065**	*5.010*
136	0.115	*0.010*	0.140	*0.060*	**20.115**	*3.270*	**9.960**	*1.420*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-599. Selected metals in the surface water after inundation of the Milang soil material (Site 10): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150** [1]		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	*0.02*	0.03	*<0.01*	<0.01	-	0.05	*0.05*	<0.01	-	0.12	*0.12*
4	0.07	*0.04*	0.05	*0.04*	0.05	*0.02*	0.16	*0.24*	<0.01	-	0.87	*0.37*
7	0.04	*0.02*	0.05	*0.04*	0.01	*0.02*	0.18	*0.15*	<0.01	-	0.97	*0.38*
11	0.02	*0.02*	0.02	*<0.01*	0.02	*0.03*	0.18	*0.12*	0.01	*<0.01*	0.96	*0.38*
18	0.02	*<0.01*	0.01	*<0.01*	0.12	*0.23*	0.26	*0.28*	<0.01	-	0.85	*0.37*
25	0.02	*<0.01*	<0.01	-	0.09	*0.16*	1.06	*1.51*	<0.01	-	1.18	*0.68*
35	0.03	*<0.01*	<0.01	-	0.05	*0.01*	0.08	*0.04*	<0.01	-	1.00	*0.47*
136	<0.01	-	0.01	*<0.01*	0.02	*0.02*	0.08	*0.09*	<0.01	-	<0.01	-

Table 9-600. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150** [1]		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	6.98	*9.12*	2.04	*3.96*	0.16	*0.24*	0.13	*0.15*	3.01	*2.68*	4.10	*5.90*
4	2.60	*3.98*	0.02	*<0.01*	0.18	*0.05*	4.53	*3.06*	1.55	*1.06*	0.92	*0.14*
7	1.49	*2.70*	0.04	*0.04*	4.07	*4.06*	17.60	*10.08*	1.10	*0.87*	1.31	*0.94*
11	0.31	*0.40*	<0.01	-	32.47	*15.71*	31.65	*23.47*	0.97	*0.78*	1.17	*0.93*
18	0.02	*<0.01*	<0.01	-	52.56	*51.89*	32.70	*40.51*	0.68	*0.47*	1.05	*0.95*
25	0.02	*<0.01*	<0.01	-	37.03	*31.74*	35.23	*44.69*	0.51	*0.37*	1.33	*1.20*
35	0.03	*<0.01*	0.02	*0.02*	34.00	*23.60*	21.66	*20.37*	0.50	*0.36*	1.04	*0.57*
136	0.02	*0.02*	<0.01	-	7.25	*7.81*	11.13	*1.75*	0.45	*0.38*	0.40	*0.22*

Table 9-601. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150** [1]		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	32.60	*2.04*	16.39	*11.71*	2.41	*0.02*	17.04	*29.19*	**8.06**	*0.50*	6.19	*0.69*
4	30.44	*2.14*	3.12	*1.12*	2.80	*0.73*	25.35	*47.20*	**7.68**	*0.76*	1.09	*0.32*
7	28.47	*2.00*	0.43	*0.64*	6.84	*1.79*	85.42	*100.38*	**7.11**	*1.15*	1.09	*0.36*
11	22.79	*1.79*	0.03	*0.04*	21.82	*7.28*	164.29	*55.06*	**6.56**	*1.00*	1.04	*0.39*
18	16.05	*1.55*	0.01	*<0.01*	48.76	*12.54*	170.07	*23.34*	**6.08**	*0.91*	0.95	*0.51*
25	5.06	*6.08*	<0.01	-	144.56	*39.23*	127.79	*25.29*	**5.18**	*0.77*	1.26	*1.00*
35	0.11	*0.08*	<0.01	-	184.87	*55.79*	83.27	*23.16*	**4.60**	*1.56*	1.21	*0.80*
136	0.01	*0.02*	<0.01	-	68.55	*50.94*	28.93	*37.58*	2.33	*1.11*	0.32	*0.16*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-602. Selected metalloids and metals in the surface water after inundation of the Milang soil material (Site 10): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.10	*0.17*	<15.0	-	1.23	*0.98*	1.65	*0.22*	2.44	*1.03*	<5.0	-
4	<1.0	-	<15.0	-	1.29	*0.01*	1.67	*0.32*	2.59	*1.25*	37.34	*26.97*
7	1.42	*0.21*	<15.0	-	1.96	*0.60*	7.29	*2.02*	2.48	*0.48*	37.42	*21.80*
11	1.04	*0.04*	<15.0	-	1.42	*0.09*	4.40	*0.04*	2.54	*0.11*	38.90	*19.33*
18	1.01	*1.07*	19.21	*10.81*	1.88	*0.45*	2.68	*0.53*	2.19	*0.22*	33.05	*19.11*
25	1.65	*0.05*	48.82	*8.94*	1.89	-	3.27	*1.94*	2.52	*0.41*	41.03	*31.32*
35	1.28	*0.14*	<15.0	-	2.71	*0.06*	2.73	*0.83*	2.12	*0.04*	26.38	*15.89*
136	1.59	*1.05*	48.21	*0.82*	1.42	*0.24*	**8.00**	*1.35*	2.25	*0.25*	11.63	*5.95*

Table 9-603. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	5.35	*1.59*	<15.0	-	**16.58**	*20.23*	**11.81**	*13.99*	**170.03**	*73.70*	190.25	*196.52*
4	4.76	*0.35*	18.09	*2.65*	9.65	*8.54*	2.87	*0.84*	**95.54**	*29.33*	13.87	*12.29*
7	9.50	*3.57*	<15.0	-	8.68	*7.89*	5.32	*0.80*	65.83	*40.68*	21.70	*25.86*
11	34.42	*16.56*	29.31	*14.71*	6.77	*4.12*	5.61	*1.55*	48.88	*35.07*	20.84	*20.20*
18	55.03	*44.26*	40.51	*12.21*	3.20	*1.62*	3.12	*0.79*	7.23	*3.46*	12.90	*9.83*
25	34.03	*30.53*	56.13	*11.13*	2.22	*1.31*	4.61	*4.42*	4.16	*2.13*	14.74	*10.30*
35	22.82	*18.72*	17.74	*6.26*	2.92	*2.26*	1.97	*0.19*	3.29	*2.13*	10.54	*4.05*
136	8.93	*5.69*	47.55	*4.96*	<1.0	-	**8.06**	*2.25*	2.35	*0.27*	7.98	*5.73*

Table 9-604. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	5.32	*0.54*	<15.0	-	**35.33**	*0.63*	**38.16**	*10.04*	**307.36**	*11.47*	221.17	*84.40*
4	3.17	*0.81*	18.50	*3.80*	**34.15**	*2.86*	**43.43**	*67.35*	**291.41**	*26.63*	48.13	*6.90*
7	3.48	*0.18*	25.11	*18.87*	**34.83**	*0.69*	**32.28**	*45.70*	**284.39**	*18.21*	27.60	*15.10*
11	4.29	*1.43*	53.34	*42.56*	**32.96**	*6.46*	**8.42**	*6.25*	**256.38**	*12.26*	12.51	*6.82*
18	5.97	*0.18*	111.55	*25.39*	**27.57**	*1.98*	4.21	*<0.01*	**230.59**	*24.10*	<5.0	-
25	32.05	*10.76*	124.46	*64.41*	4.49	*3.63*	5.94	*0.80*	**147.17**	*34.49*	<5.0	-
35	52.95	*9.46*	58.75	*48.91*	3.70	*1.49*	2.28	*0.09*	47.87	*35.95*	<5.0	-
136	32.19	*23.55*	49.32	*3.25*	<1.0	-	**8.41**	*3.30*	12.77	*15.21*	<5.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-605. Selected metals in the surface water after inundation of the Milang soil material (Site 10): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	14.10	*15.19*	18.63	*2.98*	<0.1	-	0.11	*<0.1*	<1.0	-	2.03	*1.31*
4	52.38	*8.54*	**54.83**	*17.19*	<0.1	-	0.46	*0.31*	<1.0	-	21.26	*12.43*
7	34.60	*12.05*	**50.54**	*13.11*	<0.1	-	0.37	*0.17*	<1.0	-	21.64	*12.04*
11	43.73	*17.10*	37.93	*6.04*	<0.1	-	0.45	*0.19*	<1.0	-	21.38	*10.39*
18	n.a.	-	n.a.	-	<0.1	-	0.28	*0.19*	<1.0	-	20.30	*12.00*
25	11.69	*3.35*	37.94	*22.56*	<0.1	-	0.29	*0.12*	<1.0	-	25.47	*20.90*
35	45.03	*9.59*	**74.72**	-	<0.1	-	0.26	*<0.1*	<1.0	-	20.30	*12.99*
136	7.44	*0.92*	<5.0	-	<0.1	-	0.13	*<0.1*	<1.0	-	<1.0	-

Table 9-606. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**271.61**	*22.29*	**147.43**	*125.06*	1.22	*0.72*	1.96	*1.00*	82.73	*54.67*	124.80	*172.44*
4	**415.62**	*98.65*	**72.66**	*21.47*	0.57	*0.32*	0.40	*<0.1*	47.16	*24.70*	25.04	*8.13*
7	**336.79**	*124.66*	**59.15**	*6.18*	0.27	*0.43*	0.17	*<0.1*	36.36	*26.29*	35.75	*14.35*
11	**349.30**	*395.77*	**91.15**	*19.10*	0.17	*0.16*	<0.1	-	31.71	*24.98*	27.12	*19.11*
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	7.90	*4.95*	19.81	*19.76*
25	31.79	*26.79*	33.00	*11.93*	<0.1	-	<0.1	-	2.72	*1.51*	17.84	*13.56*
35	62.24	*31.45*	**88.52**	*26.00*	<0.1	-	0.15	*<0.1*	1.84	*1.01*	14.70	*6.14*
136	16.04	*15.66*	13.34	*11.07*	<0.1	-	<0.1	-	1.17	*1.18*	5.51	*6.19*

Table 9-607. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**310.33**	*55.65*	**306.18**	*69.51*	1.92	*0.19*	1.26	*0.43*	164.49	*4.97*	129.53	*11.12*
4	**460.57**	*150.69*	**151.74**	*38.71*	1.49	*0.62*	0.38	*0.35*	157.94	*11.34*	24.78	*12.06*
7	**283.58**	*21.25*	**105.98**	*9.44*	1.62	*0.42*	0.12	*<0.1*	158.48	*23.55*	25.68	*5.83*
11	**497.70**	*331.02*	**116.66**	*63.44*	1.35	*0.39*	0.18	*<0.1*	142.57	*19.18*	24.14	*3.30*
18	n.a.	-	n.a.	-	1.21	*0.49*	0.27	*0.33*	124.90	*11.72*	14.40	*3.65*
25	**240.78**	*35.32*	22.31	*13.91*	0.58	*0.50*	<0.1	-	97.01	*25.06*	7.98	*4.97*
35	**188.49**	*127.34*	41.64	*16.93*	<0.1	-	<0.1	-	53.62	*28.79*	3.82	*0.67*
136	30.27	*16.77*	10.30	*2.30*	<0.1	-	<0.1	-	14.26	*17.00*	2.78	*0.70*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-608. Selected metals in the surface water after inundation of the Milang soil material (Site 10): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.07	*0.25*	<4.4	-	<1.0	-	<1.0	-
7	1.22	*0.11*	<4.4	-	<1.0	-	<1.0	-
11	1.49	*0.22*	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	<1.0	-	<1.0	-
25	<1.0	-	<4.4	-	<1.0	-	<1.0	-
35	2.14	*0.00*	<4.4	-	<1.0	-	<1.0	-
136	<1.0	-	<4.4	-	<1.0	-	<1.0	-

Table 9-609. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	3.01	*1.93*	<4.4	-	4.50	*7.68*	2.97	*5.89*
4	<1.0	-	<4.4	-	1.84	*2.90*	<1.0	-
7	1.17	*0.54*	<4.4	-	1.93	*2.67*	<1.0	-
11	1.58	*0.62*	<4.4	-	2.76	*2.31*	<1.0	-
18	1.26	*0.79*	<4.4	-	1.57	*1.17*	<1.0	-
25	2.13	*0.03*	4.65	*0.41*	<1.0	-	<1.0	-
35	3.85	*1.21*	<4.4	-	<1.0	-	<1.0	-
136	1.04	*0.36*	<4.4	-	<1.0	-	<1.0	-

Table 9-610. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	13.72	*1.25*	5.85	*0.83*	3.50	*5.04*	**12.77**	*2.08*
4	9.10	*1.36*	<4.4	-	3.75	*4.47*	**33.76**	*31.44*
7	7.81	*1.37*	<4.4	-	3.96	*4.23*	10.81	*18.76*
11	6.41	*1.32*	<4.4	-	2.90	*2.96*	<1.0	-
18	4.51	*0.29*	<4.4	-	3.66	*2.47*	<1.0	-
25	2.98	*2.44*	<4.4	-	<1.0	-	<1.0	-
35	3.82	*0.22*	<4.4	-	<1.0	-	<1.0	-
136	1.55	*0.46*	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-611. Major cations in the surface water after inundation of the Milang soil material (Site 10): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	101	<1	11708	377	4.4	0.1	372.4	6.4	19.0	0.9	486.6	10.2
4	122	1	9666	644	5.5	0.2	366.8	22.4	24.2	0.4	476.8	23.8
7	103	8	9587	557	5.0	0.5	324.0	16.2	23.3	1.5	445.7	6.3
11	105	10	9513	10	4.8	0.5	325.1	5.1	22.8	1.1	422.3	1.2
18	106	16	9254	713	4.7	0.4	343.2	7.9	21.6	2.0	422.7	17.8
25	110	6	10150	799	5.2	<0.1	391.2	26.9	22.2	0.6	518.4	85.0
35	125	<1	9353	155	5.3	0.5	358.8	8.8	20.9	0.3	443.3	7.5
136	162	16	11066	218	8.3	<0.1	405.7	1.0	26.0	2.3	481.6	3.2

Table 9-612. Major cations in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	526	383	8967	798	41.0	27.3	296.6	32.7	96.9	72.3	469.0	69.8
4	367	201	9272	1039	26.9	14.0	351.1	31.1	59.5	35.6	461.7	33.7
7	250	164	9643	435	18.2	13.6	334.3	3.7	41.0	27.8	453.1	0.2
11	240	165	9507	671	16.0	12.3	320.3	15.2	33.5	21.5	418.8	18.9
18	198	105	9016	286	10.4	6.4	324.9	14.2	21.4	9.3	399.6	10.4
25	202	100	8925	2395	10.0	5.5	337.7	76.7	20.3	3.3	452.8	141.8
35	214	117	9029	1084	9.8	4.8	343.7	29.1	20.4	4.4	439.0	14.6
136	237	91	10908	433	11.9	5.0	399.3	10.3	30.0	6.1	479.2	6.3

Table 9-613. Major cations in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	903	339	1167	536	59.8	14.1	61.4	29.7	221.2	34.8	194.8	38.2
4	996	321	8670	44	64.3	14.5	320.9	4.0	223.6	13.0	419.9	31.6
7	830	349	8846	630	55.7	15.5	287.0	22.7	205.6	29.8	422.9	37.5
11	800	305	8754	166	54.6	16.3	278.3	21.6	193.6	28.2	393.2	3.4
18	675	215	8410	426	43.7	7.8	283.5	16.4	169.5	12.9	388.9	16.2
25	677	193	8415	447	37.6	11.6	307.9	5.3	145.5	23.9	407.9	2.2
35	618	291	8403	273	31.1	14.3	294.9	5.7	114.7	39.6	410.6	15.6
136	431	177	10508	789	22.8	13.2	374.5	25.0	74.7	32.6	461.4	24.9

Table 9-614. Major cations and anions in the surface water after inundation of the Milang soil material (Site 10): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	13.8	*0.1*	1475.2	*46.2*	163	*30*	22271	*852*	30	*32*	3344	*241*
4	17.0	*0.7*	1275.3	*93.2*	198	*23*	18943	*556*	42	*20*	2954	*111*
7	12.6	*1.1*	1244.0	*93.0*	200	*2*	20639	*768*	34	*9*	2803	*73*
11	12.4	*1.6*	1296.7	*15.3*	189	*15*	19589	*573*	37	*2*	2801	*53*
18	14.1	*2.1*	1170.7	*51.6*	182	*27*	17377	*1026*	41	*7*	2805	*175*
25	13.5	*0.9*	1304.8	*163.2*	206	*21*	20076	*163*	37	*14*	3004	*229*
35	16.2	*0.8*	1126.5	*8.5*	194	*8*	19040	*325*	55	*9*	2963	*12*
136	22.9	*2.1*	1369.2	*12.4*	266	*35*	21966	*359*	69	*6*	3137	*18*

Table 9-615. Major cations and anions in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 10): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	103.3	*99.5*	1188.0	*2.6*	813	*546*	17554	*2388*	732	*755*	3136	*675*
4	67.1	*51.5*	1232.5	*145.0*	511	*230*	18412	*1464*	436	*344*	2905	*307*
7	36.1	*34.0*	1273.6	*42.4*	417	*193*	20757	*1223*	306	*305*	2860	*61*
11	30.3	*27.5*	1303.0	*83.5*	374	*204*	19744	*944*	221	*198*	2757	*80*
18	26.1	*18.8*	1108.6	*44.4*	326	*171*	17277	*1181*	96	*90*	2642	*77*
25	24.0	*13.3*	1180.5	*402.9*	333	*122*	18020	*3242*	54	*16*	2607	*445*
35	26.6	*13.7*	1117.8	*43.7*	329	*147*	18795	*1077*	56	*47*	2881	*303*
136	40.0	*19.8*	1345.4	*28.3*	334	*69*	21954	*15*	171	*131*	3087	*113*

Table 9-616. Major cations and anions in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	296.7	*90.1*	277.3	*94.7*	1242	*485*	1836	*735*	2108	*413*	1983	*318*
4	318.4	*79.5*	1151.6	*32.4*	1280	*457*	17070	*548*	2156	*342*	2768	*33*
7	243.9	*85.4*	1147.0	*109.7*	1277	*471*	18718	*1071*	1898	*396*	2750	*224*
11	223.0	*77.0*	1189.1	*42.3*	1111	*388*	17968	*54*	1810	*347*	2620	*128*
18	213.2	*55.2*	1064.1	*50.9*	969	*340*	15986	*467*	1708	*283*	2584	*309*
25	199.5	*52.9*	1072.0	*10.1*	984	*275*	17633	*416*	1615	*218*	2454	*156*
35	177.1	*70.4*	1035.3	*61.7*	913	*446*	17419	*909*	1337	*422*	2623	*112*
136	118.4	*63.6*	1294.9	*71.9*	523	*218*	20860	*1540*	824	*493*	2992	*110*

Table 9-617. Selected surface water properties after inundation of the Milang soil material (Site 11): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.78	0.99	6.30	0.91	491	214	426	11	2.4	<0.1	3.7	0.1
4	7.04	0.23	7.09	0.12	403	126	362	3	2.1	0.1	3.6	0.1
7	7.10	0.02	7.30	0.34	382	4	267	25	2.7	0.4	4.2	0.1
11	6.63	1.09	7.12	0.25	329	177	169	13	2.3	0.1	4.2	0.3
18	7.04	0.31	7.22	0.26	240	5	134	3	1.5	0.3	3.7	0.3
25	7.09	0.75	7.78	0.19	204	12	232	40	2.4	0.4	3.8	0.6
35	7.23	0.26	7.78	0.21	173	40	163	7	2.9	0.2	4.0	0.4
136	7.90	0.14	7.65	0.01	157	5	163	89	4.7	1.2	4.4	0.9

Table 9-618. Selected pore-water properties (3-5 cm) after inundation of the Milang soil material (Site 11): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.83	1.08	6.59	0.73	490	214	436	5	3.4	0.6	3.6	0.1
4	7.00	0.16	6.98	0.50	386	67	382	20	4.8	0.4	4.1	0.5
7	6.88	0.22	7.42	0.06	351	96	291	22	6.2	1.4	4.5	0.5
11	6.99	0.45	7.29	0.14	326	137	220	25	4.7	4.6	4.5	0.1
18	7.12	0.13	7.19	0.25	254	11	179	36	4.3	2.3	4.3	0.2
25	7.07	0.14	7.50	0.19	194	117	188	29	6.8	1.6	4.2	0.9
35	7.06	0.22	7.15	0.13	142	19	155	30	6.2	1.9	4.5	0.8
136	7.19	0.19	7.32	0.60	158	27	142	31	7.7	0.4	5.1	0.7

Table 9-619. Selected pore-water properties (10-12 cm) after inundation of the Milang soil material (Site 11): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	6.86	0.20	6.84	0.46	421	253	441	3	5.2	1.5	4.4	2.3
4	6.65	0.32	6.44	0.77	324	110	367	20	7.1	-	4.1	3.6
7	6.61	0.21	6.58	0.56	300	29	289	55	7.0	1.7	4.9	2.8
11	6.70	0.15	6.76	0.34	220	56	230	65	8.0	1.9	5.3	1.9
18	6.83	0.14	6.84	0.43	141	26	195	84	6.2	2.3	4.9	1.3
25	6.86	0.17	6.73	0.27	123	13	152	33	12.4	2.5	7.1	2.1
35	6.71	0.21	6.71	0.01	107	19	121	3	14.9	1.2	9.1	1.6
136	7.02	0.37	6.91	0.14	171	27	113	2	14.7	2.3	7.9	2.7

Table 9-620. Selected surface water properties after inundation of the Milang soil material (Site 11): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.33	<0.2	<0.2	-	<0.2	-	7.6	-	5.5	-
4	<0.2	-	0.25	0.30	0.53	<0.2	<0.2	-				
7	0.68	0.65	0.35	<0.2	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.7	-	6.6	-
18	0.55	<0.2	0.58	<0.2	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	8.1	-	6.0	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	8.2	0.7	6.2	0.5

Table 9-621. Selected pore-water properties (3-5 cm) after inundation of the Milang soil material (Site 11): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.28	<0.2	<0.2	-	<0.2	-	27.0	-	12.0	-
4	<0.2	-	<0.2	-	0.60	<0.2	<0.2	-				
7	1.05	0.60	0.25	0.20	<0.2	-	<0.2	-				
11	0.20	0.40	<0.2	-	0.81	1.63	<0.2	-	36.0	-	7.7	-
18	1.55	0.56	2.90	4.27	0.74	0.25	0.28	0.32				
25	0.76	<0.2	0.39	0.59	0.73	<0.2	0.28	0.23				
35	1.57	1.53	2.77	0.85	0.46	0.30	<0.2	-	17.0	-	7.4	-
136	1.54	1.44	3.37	6.74	0.78	1.11	0.94	1.80	13.3	7.4	9.3	1.4

Table 9-622. Selected pore-water properties (10-12 cm) after inundation of the Milang soil material (Site 11): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	<0.2	-	0.33	<0.2	<0.2	-	<0.2	-	31.0	-	31.0	-
4	0.45	0.90	0.78	1.25	1.00	0.60	<0.2	-				
7	1.05	1.10	6.08	10.95	<0.2	-	5.78	11.55				
11	0.73	0.55	18.68	37.35	0.56	<0.2	1.24	2.48	39.0	-	30.0	-
18	20.64	13.60	59.82	118.49	1.09	1.50	2.19	4.33				
25	22.85	9.80	33.50	45.16	23.72	7.54	28.90	53.24				
35	48.13	21.23	120.46	63.70	7.68	1.04	0.91	1.83	54.0	-	37.0	-
136	2.89	3.65	19.31	4.10	0.83	1.08	<0.2	-	49.5	3.0	28.0	4.0

Table 9-623. Selected nutrients in the surface water after inundation of the Milang soil material (Site 11): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	5.280	*10.360*	0.743	*0.255*	0.060	*0.060*	0.053	*0.035*
4	0.138	*0.016*	3.380	*0.460*	0.007	*0.006*	0.065	*0.050*
7	0.170	*0.060*	3.645	*0.370*	0.025	*0.030*	0.175	*0.170*
11	0.345	*0.090*	5.180	*0.040*	0.050	*0.020*	0.325	*0.470*
18	0.495	*0.010*	3.660	*0.500*	0.010	*0.020*	0.365	*0.510*
25	0.560	*0.040*	3.765	*0.590*	<0.005	-	0.030	*0.060*
35	0.600	*0.100*	3.375	*0.430*	0.005	*0.010*	<0.005	-
136	0.350	*0.220*	6.095	*2.350*	0.015	*0.010*	0.005	*0.010*

Table 9-624. Selected nutrients in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	16.760	*5.600*	14.285	*1.550*	0.145	*0.010*	0.090	*0.100*
4	0.325	*0.270*	4.690	*3.900*	0.030	*<0.005*	0.110	*0.020*
7	0.065	*0.010*	4.255	*1.330*	0.010	*<0.005*	0.210	*0.060*
11	0.230	*0.160*	3.710	*0.360*	0.030	*0.020*	0.195	*0.290*
18	0.210	*0.160*	1.870	*0.900*	0.020	*<0.005*	0.235	*0.330*
25	0.235	*0.050*	2.670	*3.140*	0.005	*0.010*	0.050	*0.060*
35	0.215	*0.150*	2.115	*2.110*	0.010	*0.020*	0.020	*<0.005*
136	0.670	*0.460*	3.835	*1.010*	0.005	*0.010*	0.090	*<0.005*

Table 9-625. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	**25.750**	*5.940*	53.929	*24.450*	0.150	*0.020*	0.640	*1.100*
4	15.970	*1.800*	19.985	*15.190*	0.110	*0.060*	0.325	*0.410*
7	8.920	*0.760*	14.185	*23.890*	0.100	*0.100*	0.105	*0.090*
11	1.845	*0.990*	9.210	*18.140*	0.015	*0.010*	0.020	*0.020*
18	0.060	*0.060*	1.380	*2.760*	0.115	*0.010*	0.210	*0.360*
25	0.215	*0.030*	0.105	*0.170*	0.175	*0.030*	0.300	*0.480*
35	0.340	*0.040*	0.225	*0.110*	0.230	*0.100*	0.290	*0.160*
136	0.090	-	0.600	*0.600*	0.020	-	0.120	*0.040*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-626. Selected nutrients in the surface water after inundation of the Milang soil material (Site 11): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.115	*0.190*	0.025	*0.010*	0.215	*0.050*	0.360	*0.440*
4	0.080	*0.020*	0.120	*<0.005*	0.160	*0.040*	0.475	*0.470*
7	0.030	*0.020*	0.095	*0.010*	0.635	*0.090*	0.485	*0.450*
11	0.045	*0.010*	0.190	*0.060*	0.175	*0.210*	0.525	*0.150*
18	0.050	*<0.005*	0.135	*0.050*	0.180	*0.120*	0.160	*0.040*
25	0.075	*0.010*	0.145	*0.110*	0.090	*0.020*	0.395	*0.010*
35	0.080	*0.040*	0.125	*0.050*	0.085	*0.050*	0.070	*<0.005*
136	0.085	*0.010*	0.100	*0.060*	0.080	*<0.005*	0.070	*<0.005*

Table 9-627. Selected nutrients in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.450	*0.220*	0.405	*0.270*	0.975	*1.490*	0.030	*0.040*
4	0.585	*0.010*	0.285	*0.270*	1.680	*0.080*	1.095	*0.090*
7	0.545	*0.130*	0.150	*0.080*	2.285	*0.010*	0.840	*0.100*
11	0.350	*0.560*	0.270	*0.100*	1.180	*1.480*	1.415	*0.450*
18	0.265	*0.210*	0.170	*0.280*	1.795	*0.870*	**2.155**	*1.310*
25	0.200	*0.160*	0.110	*0.080*	1.845	*0.290*	1.195	*1.110*
35	0.135	*0.170*	0.035	*0.030*	1.960	*0.620*	1.565	*0.250*
136	1.475	*0.170*	0.095	*0.070*	**2.605**	*0.110*	1.630	*2.540*

Table 9-628. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.555	*0.030*	0.410	*0.560*	**3.145**	*3.090*	**3.665**	*7.030*
4	0.615	*0.170*	0.390	*0.620*	**5.385**	*2.370*	**6.160**	*6.160*
7	0.525	*0.130*	0.270	*0.460*	**6.585**	*2.430*	**9.030**	*7.600*
11	0.500	*0.060*	0.385	*0.590*	**7.240**	*2.200*	**10.240**	*7.700*
18	0.155	*0.150*	0.490	*0.200*	**9.295**	*2.810*	**11.785**	*11.930*
25	0.170	*0.080*	0.390	*0.560*	**11.740**	*2.400*	**15.915**	*13.130*
35	0.215	*0.010*	0.285	*0.110*	**12.950**	*1.900*	**16.355**	*10.090*
136	4.190	-	0.280	*0.180*	**11.350**	*0.960*	**10.005**	*7.710*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-629. Selected metals in the surface water after inundation of the Milang soil material (Site 11): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	<0.01	0.01	0.01	<0.01	-	0.11	0.13	<0.01	-	<0.01	-
4	0.02	0.02	0.01	<0.01	0.05	0.01	0.09	0.13	<0.01	-	0.11	0.17
7	0.03	0.01	0.03	0.02	0.03	0.04	0.11	0.12	0.02	<0.01	0.23	0.30
11	0.03	0.01	<0.01	-	0.08	0.13	0.16	0.17	<0.01	-	0.36	0.46
18	0.02	<0.01	0.02	0.02	0.09	0.07	0.37	0.06	<0.01	-	0.38	0.44
25	0.02	<0.01	<0.01	-	0.12	0.06	0.27	0.04	<0.01	-	0.24	0.31
35	0.02	<0.01	<0.01	-	0.10	0.07	0.04	0.05	<0.01	-	0.03	<0.01
136	<0.01	-	<0.01	-	0.03	0.03	0.07	<0.01	<0.01	-	<0.01	-

Table 9-630. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.03	<0.01	<0.01	-	0.01	0.03	0.06	0.04	0.21	0.43	<0.01	-
4	0.02	<0.01	0.01	<0.01	0.05	0.02	0.03	0.02	0.35	0.17	0.57	0.04
7	0.04	<0.01	0.04	0.03	0.57	0.32	0.06	0.05	1.17	0.78	0.53	0.05
11	0.09	0.04	<0.01	-	1.13	2.09	0.11	0.05	0.96	1.73	1.25	1.18
18	0.02	0.01	<0.01	-	1.61	0.70	2.40	4.08	1.61	1.00	1.89	1.63
25	<0.01	-	<0.01	-	1.34	0.10	0.64	0.73	1.55	0.32	0.94	0.77
35	<0.01	-	<0.01	-	1.95	1.85	2.44	0.63	1.62	0.73	1.03	0.33
136	<0.01	-	<0.01	-	2.21	2.33	3.55	6.81	1.12	0.12	0.50	0.90

Table 9-631. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.01	0.02	0.04	0.08	0.02	0.04	0.04	0.01	0.44	0.02	0.63	1.23
4	0.02	0.01	0.32	0.61	0.61	1.13	0.48	0.90	1.65	0.59	2.09	1.25
7	0.02	<0.01	0.19	0.33	0.43	0.80	5.30	10.54	2.23	0.91	3.48	1.13
11	0.01	<0.01	0.02	0.01	1.43	0.45	20.71	41.31	3.26	0.16	4.68	2.98
18	<0.01	-	0.02	0.03	19.30	13.59	53.59	106.99	**7.88**	0.63	4.67	2.73
25	<0.01	-	<0.01	-	45.51	15.98	72.96	120.62	**9.53**	1.84	7.64	3.03
35	<0.01	-	0.02	0.03	58.74	27.93	92.74	43.33	**9.32**	3.23	8.40	3.33
136	<0.01	-	<0.01	-	3.11	4.45	17.66	0.30	3.34	2.10	3.24	0.77

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-632. Selected metalloids and metals in the surface water after inundation of the Milang soil material (Site 11): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	3.42	4.77	<15.0	-	4.06	5.39	2.07	0.67	4.39	5.71	<5.0	-
4	<1.0	-	16.24	5.03	1.42	0.57	2.21	1.57	1.90	0.01	5.36	0.09
7	1.71	0.12	<15.0	-	1.86	0.14	6.63	5.55	2.20	0.09	6.01	0.14
11	2.04	0.34	<15.0	-	1.65	0.39	4.97	2.52	2.56	0.40	8.68	2.98
18	2.84	0.81	21.75	0.09	3.71	2.89	3.97	0.98	1.86	0.15	8.05	3.24
25	3.78	0.23	41.92	4.47	2.24	0.26	2.97	<0.01	2.28	0.43	9.29	3.04
35	3.02	0.45	<15.0	-	2.57	0.52	3.68	1.88	2.34	0.16	<5.0	-
136	2.88	0.03	47.66	4.62	1.42	0.86	3.29	0.22	3.30	0.12	6.14	1.03

Table 9-633. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	10.27	0.29	<15.0	-	11.24	1.33	**8.42**	0.31	23.66	23.83	12.18	0.06
4	11.91	2.39	15.12	0.53	8.52	0.40	3.81	0.68	14.18	2.41	9.06	2.61
7	21.13	4.39	14.26	11.28	5.96	0.15	6.79	4.07	18.45	4.66	9.55	2.60
11	15.89	26.20	<15.0	-	1.76	0.19	6.59	2.79	8.94	11.69	13.75	5.82
18	31.09	17.57	23.67	1.15	1.94	1.54	2.62	0.89	7.86	2.77	13.74	6.86
25	32.12	8.70	40.67	6.29	1.35	0.48	2.24	1.13	5.39	0.26	11.52	0.86
35	27.68	13.30	<15.0	-	1.52	0.38	3.18	1.05	4.41	0.04	7.74	0.23
136	19.42	7.78	52.47	11.97	<1.0	-	4.58	0.80	4.69	0.42	5.77	0.56

Table 9-634. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	14.55	0.15	<15.0	-	**15.91**	0.07	**14.75**	4.33	48.59	11.42	72.05	51.80
4	11.79	1.74	16.00	0.94	**17.45**	0.31	**12.56**	2.39	63.48	25.91	89.58	59.10
7	15.96	3.73	<15.0	-	**18.17**	2.72	**11.54**	3.55	63.66	26.12	97.62	50.71
11	25.21	10.70	20.06	11.23	11.07	1.22	**10.26**	5.52	58.34	20.10	83.81	55.92
18	47.51	22.58	42.35	41.26	3.63	1.69	5.68	4.12	67.83	9.96	61.73	18.78
25	72.64	7.69	69.16	43.73	2.21	1.06	4.75	0.22	64.69	15.44	54.68	45.82
35	109.36	9.76	61.25	42.98	2.63	0.83	4.71	1.19	28.50	1.55	37.10	52.90
136	62.14	18.61	80.13	4.55	<1.0	-	4.59	2.02	10.93	0.91	6.46	0.06

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-635. Selected metals in the surface water after inundation of the Milang soil material (Site 11): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	14.91	*3.19*	19.56	*7.10*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	34.17	*4.92*	39.68	*34.35*	<0.1	-	0.18	*<0.1*	<1.0	-	<1.0	-
7	58.99	-	35.57	*2.67*	<0.1	-	0.52	*0.74*	<1.0	-	2.31	*0.30*
11	28.91	*0.04*	35.39	*3.12*	<0.1	-	0.26	*<0.1*	1.49	*2.54*	2.88	*2.71*
18	n.a.	-	n.a.	-	<0.1	-	0.19	*<0.1*	<1.0	-	4.10	*4.11*
25	5.64	*0.30*	10.77	*1.47*	<0.1	-	0.18	*<0.1*	<1.0	-	3.37	*2.99*
35	36.89	*3.30*	**49.44**	-	<0.1	-	0.22	*<0.1*	<1.0	-	1.43	*0.28*
136	3.11	*0.05*	<5.0	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-

Table 9-636. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	32.08	*17.37*	27.04	*8.92*	0.15	*0.20*	0.14	*<0.1*	5.58	*6.31*	2.30	*0.63*
4	121.77	*56.51*	**72.71**	*1.40*	<0.1	-	0.30	*<0.1*	3.75	*0.89*	2.31	*0.20*
7	50.42	*15.14*	**50.39**	*12.56*	<0.1	-	0.28	*<0.1*	6.18	*2.39*	2.43	*0.44*
11	35.07	-	**75.50**	-	<0.1	-	0.25	*0.18*	2.88	*4.56*	6.42	*7.39*
18	n.a.	-	n.a.	-	<0.1	-	0.13	*0.10*	2.63	*0.92*	17.01	*22.77*
25	12.87	*13.79*	23.01	*13.97*	<0.1	-	0.15	*0.15*	1.52	*0.29*	7.47	*3.01*
35	23.09	*1.55*	37.68	*37.52*	<0.1	-	0.19	*<0.1*	1.19	*0.32*	7.67	*0.43*
136	6.08	*1.47*	5.96	*2.33*	<0.1	-	<0.1	-	1.08	*0.01*	2.75	*2.61*

Table 9-637. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	57.38	*3.56*	**75.95**	*41.81*	0.35	*0.13*	0.50	*0.80*	9.41	*1.10*	28.93	*41.94*
4	125.55	*16.28*	**129.45**	*109.60*	0.34	*0.30*	1.16	*0.94*	19.79	*13.93*	47.26	*74.49*
7	99.84	*22.11*	**163.07**	*75.83*	0.51	*0.55*	1.37	*0.25*	25.03	*14.89*	74.48	*95.88*
11	161.00	*72.02*	**142.74**	*57.34*	0.25	*0.14*	0.88	*1.09*	34.74	*6.12*	122.71	*174.54*
18	n.a.	-	n.a.	-	0.14	*<0.1*	0.43	*0.66*	95.61	*11.78*	92.76	*126.34*
25	26.44	*18.45*	**45.68**	*20.90*	0.16	*<0.1*	0.17	*<0.1*	84.03	*48.05*	138.36	*94.20*
35	28.17	*13.89*	**75.22**	*19.72*	<0.1	-	0.18	*<0.1*	29.72	*24.66*	82.28	*96.04*
136	10.89	*9.86*	6.94	*2.30*	<0.1	-	<0.1	-	5.64	*2.17*	7.10	*2.01*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-638. Selected metals in the surface water after inundation of the Milang soil material (Site 11): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.35	*0.42*	<4.4	-	<1.0	-	1.42	*2.38*
11	1.69	*0.57*	<4.4	-	<1.0	-	<1.0	-
18	1.06	*0.18*	<4.4	-	<1.0	-	<1.0	-
25	1.60	*0.80*	<4.4	-	<1.0	-	<1.0	-
35	2.44	*0.07*	<4.4	-	<1.0	-	<1.0	-
136	1.57	*0.16*	<4.4	-	<1.0	-	<1.0	-

Table 9-639. Selected metals in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.51	*1.56*	<4.4	-	<1.0	-	<1.0	-
4	1.57	*0.54*	<4.4	-	<1.0	-	<1.0	-
7	1.68	*0.19*	<4.4	-	1.47	-	<1.0	-
11	1.84	*0.40*	<4.4	-	<1.0	-	<1.0	-
18	1.39	*0.10*	<4.4	-	<1.0	-	<1.0	-
25	2.30	*0.87*	<4.4	-	<1.0	-	<1.0	-
35	2.90	*0.36*	<4.4	-	<1.0	-	<1.0	-
136	1.94	*0.42*	<4.4	-	<1.0	-	<1.0	-

Table 9-640. Selected metals in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.96	*0.89*	<4.4	-	<1.0	-	<1.0	-
4	2.50	*1.69*	<4.4	-	<1.0	-	1.46	*2.65*
7	2.05	*0.02*	<4.4	-	<1.0	-	<1.0	-
11	3.46	*0.14*	<4.4	-	<1.0	-	1.60	*1.64*
18	1.59	*0.28*	<4.4	-	<1.0	-	1.05	*<1.0*
25	4.73	*0.50*	<4.4	-	<1.0	-	<1.0	-
35	5.93	*0.08*	<4.4	-	<1.0	-	<1.0	-
136	3.95	*0.11*	4.51	*3.14*	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-641. Major cations in the surface water after inundation of the Milang soil material (Site 11): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	187	167	10614	57	12.6	16.7	359.0	8.0	58.7	77.0	437.9	8.9
4	123	10	9723	446	5.7	0.5	362.9	17.4	23.9	1.7	492.1	5.3
7	112	10	9338	447	5.8	1.0	333.1	1.2	26.9	2.6	479.9	18.6
11	115	4	9662	488	5.8	0.5	332.1	15.0	28.0	1.6	468.6	24.0
18	105	9	9503	199	5.6	0.6	354.2	0.4	28.8	3.2	472.2	10.3
25	119	6	8868	672	6.7	0.4	354.3	32.1	30.7	1.2	469.7	50.7
35	132	12	9232	859	7.2	0.9	363.3	26.4	31.1	2.0	489.8	55.0
136	184	26	10775	794	11.6	1.2	394.5	26.8	55.7	16.4	514.6	57.5

Table 9-642. Major cations in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	517	404	9018	216	41.7	22.0	306.3	3.4	173.1	121.9	546.7	51.7
4	331	99	8966	325	28.3	2.9	341.5	20.5	99.9	11.9	523.4	15.6
7	256	85	9337	969	19.3	3.7	340.8	14.6	95.4	17.2	507.5	7.9
11	180	116	9692	166	10.9	9.0	334.0	0.6	53.2	47.9	480.9	21.3
18	190	82	9479	777	11.8	4.4	341.2	18.3	68.8	22.2	482.7	38.3
25	197	47	8812	682	13.0	2.7	340.1	39.1	64.1	11.8	473.3	62.7
35	202	40	9002	225	12.2	1.8	350.0	2.0	59.3	11.1	496.1	19.6
136	253	18	10998	1406	13.8	<0.1	402.4	47.6	76.0	10.0	522.4	68.2

Table 9-643. Major cations in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	1005	244	2749	1366	73.8	23.3	118.6	32.1	349.3	74.9	499.7	76.9
4	1177	61	5580	834	85.2	6.7	228.4	14.9	399.3	42.7	631.2	150.1
7	996	102	6340	1123	70.9	5.3	235.4	12.4	353.8	59.6	614.1	39.6
11	922	125	7407	1417	64.3	1.0	252.1	27.1	311.1	42.1	559.6	46.5
18	795	124	7854	434	48.9	<0.1	276.0	6.3	294.5	17.9	525.5	74.3
25	827	16	7629	472	45.8	4.7	274.7	4.0	281.9	16.3	538.6	129.1
35	759	70	8168	767	39.6	2.4	272.6	24.5	244.7	2.1	512.5	70.2
136	485	32	10228	807	22.7	1.8	365.9	32.5	140.6	10.3	513.9	74.8

Table 9-644. Major cations and anions in the surface water after inundation of the Milang soil material (Site 11): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	26.3	*25.2*	1317.1	*46.4*	275	*259*	20332	*365*	122	*195*	2928	*171*
4	17.8	*1.3*	1235.6	*22.8*	179	*4*	18812	*237*	50	*19*	2917	*17*
7	14.6	*2.0*	1244.1	*25.9*	181	*26*	20031	*1088*	55	*4*	2730	*232*
11	14.5	*1.2*	1318.4	*90.0*	173	*26*	20136	*1545*	24	*17*	2761	*5*
18	15.0	*1.6*	1183.9	*7.8*	168	*<1*	18143	*138*	39	*24*	2892	*19*
25	16.0	*2.0*	1090.4	*57.8*	195	*26*	18517	*910*	33	*4*	2622	*53*
35	18.8	*2.2*	1123.5	*101.3*	200	*21*	18919	*1275*	60	*2*	3050	*258*
136	30.2	*6.3*	1306.7	*121.6*	284	*39*	21486	*1763*	66	*10*	3080	*267*

Table 9-645. Major cations and anions in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	84.6	*90.6*	1152.4	*29.0*	797	*702*	17488	*508*	539	*596*	2865	*45*
4	55.2	*22.8*	1193.8	*46.1*	470	*120*	17636	*340*	256	*87*	2870	*9*
7	42.8	*18.4*	1256.1	*81.5*	423	*147*	19845	*2562*	188	*75*	2776	*190*
11	29.0	*27.8*	1343.7	*10.4*	257	*184*	19953	*103*	64	*62*	2768	*110*
18	36.4	*19.8*	1185.7	*68.1*	292	*122*	17720	*1037*	63	*37*	2845	*94*
25	33.1	*11.5*	1082.0	*84.6*	315	*82*	18226	*1654*	35	*4*	2649	*327*
35	34.7	*11.4*	1108.2	*17.1*	307	*71*	18987	*1094*	47	*15*	2926	*119*
136	40.6	*2.3*	1316.5	*159.0*	355	*40*	21832	*2704*	57	*3*	3062	*414*

Table 9-646. Major cations and anions in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): Mg^{2+}, Cl^{-}, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^{-} (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	186.5	*44.3*	421.1	*152.3*	1566	*279*	4716	*2421*	1222	*304*	2088	*55*
4	225.6	*27.3*	786.9	*72.9*	1766	*365*	10684	*1403*	1403	*266*	2497	*114*
7	181.3	*26.2*	846.9	*127.5*	1725	*274*	12942	*3242*	1242	*177*	2604	*218*
11	160.3	*24.9*	994.4	*178.9*	1384	*260*	14983	*3539*	1080	*192*	2596	*177*
18	155.3	*26.2*	991.5	*13.1*	1273	*186*	14814	*1214*	1028	*161*	2628	*46*
25	153.7	*3.3*	970.0	*24.8*	1285	*118*	16181	*762*	901	*51*	2516	*232*
35	150.7	*7.4*	984.2	*77.3*	1178	*104*	16303	*1854*	737	*25*	2694	*91*
136	95.3	*0.2*	1248.7	*60.0*	634	*69*	20632	*1581*	229	*60*	2803	*309*

Table 9-647. Selected surface water properties after inundation of the Ewe Island Barrage soil material (Site 12): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.37	*0.67*	7.28	*0.06*	374	*6*	438	*3*	2.3	*0.1*	3.7	*0.1*
4	7.51	*0.25*	7.34	*0.05*	331	*62*	342	*61*	2.4	*0.5*	4.6	*0.3*
7	7.34	*0.19*	7.39	*0.07*	257	*17*	270	*94*	3.6	*0.1*	5.9	*0.5*
11	7.37	*0.22*	7.39	*0.12*	194	*13*	214	*103*	4.2	*0.2*	7.0	*1.1*
18	7.61	*0.19*	7.32	*0.06*	309	*10*	215	*34*	3.1	*0.3*	6.6	*1.2*
25	7.80	*0.20*	7.61	*0.12*	222	*50*	220	*9*	5.4	*1.0*	7.3	*1.4*
35	7.64	*0.16*	7.61	*0.08*	172	*15*	183	*11*	5.8	*0.7*	6.9	*1.1*
136	8.21	*0.02*	7.80	*0.20*	189	*27*	135	*13*	6.8	*0.7*	6.7	*1.9*

Table 9-648. Selected pore-water properties (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.34	*0.33*	7.36	*0.15*	385	*5*	400	*85*	7.4	*6.7*	5.4	*2.9*
4	7.37	*0.31*	7.39	*0.01*	337	*39*	350	*35*	13.5	*1.3*	4.6	*0.2*
7	7.22	*0.21*	7.40	*0.19*	219	*14*	276	*86*	10.9	*2.6*	5.9	*0.2*
11	7.35	*0.21*	7.52	*0.01*	217	*3*	241	*60*	8.0	*3.9*	7.1	*0.7*
18	7.57	*0.14*	7.44	*0.01*	313	*4*	234	*23*	5.1	*1.1*	6.9	*1.0*
25	7.69	*0.06*	7.61	*0.16*	246	*27*	277	*60*	7.9	*1.8*	7.4	*0.9*
35	7.47	*0.07*	7.61	*0.09*	192	*61*	212	*13*	8.8	*0.7*	7.1	*1.1*
136	7.75	*0.19*	7.70	*0.38*	207	*19*	162	*4*	8.0	*0.3*	7.2	*1.2*

Table 9-649. Selected pore-water properties (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.49	*0.13*	7.53	*0.24*	384	*8*	391	*77*	5.5	*4.0*	6.7	*1.3*
4	7.33	*0.25*	7.19	*0.18*	228	*77*	173	*16*	8.3	*1.8*	7.3	*0.3*
7	7.11	*0.24*	7.18	*0.16*	180	*4*	160	*3*	9.0	*2.1*	7.7	*0.3*
11	7.18	*0.21*	7.30	*0.05*	194	*17*	146	*7*	9.1	*1.5*	8.2	*<0.1*
18	7.42	*0.04*	7.19	*0.10*	314	*7*	146	*7*	6.2	*1.3*	10.2	*5.1*
25	7.46	*0.05*	7.17	*0.01*	265	*22*	148	*8*	10.4	*2.2*	8.4	*0.2*
35	7.31	*0.04*	7.10	*0.10*	216	*11*	126	*7*	10.5	*1.7*	8.3	*0.1*
136	7.45	*0.01*	7.05	*0.06*	213	*1*	123	*1*	10.4	*0.4*	8.9	*0.6*

Table 9-650. Selected surface water properties after inundation of the Ewe Island Barrage soil material (Site 12): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.43	*0.35*	0.23	*<0.2*	<0.2	-	<0.2	-	6.7	-	4.1	-
4	<0.2	-	0.20	*0.20*	<0.2	-	<0.2	-				
7	0.83	*0.25*	0.78	*0.75*	<0.2	-	<0.2	-				
11	<0.2	-	0.30	*0.60*	<0.2	-	<0.2	-	7.2	-	5.0	-
18	0.56	*<0.2*	0.60	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	8.8	-	5.2	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	9.5	*0.6*	5.8	*0.4*

Table 9-651. Selected pore-water properties (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.38	*<0.2*	1.90	*3.80*	<0.2	-	<0.2	-	11.0	-	12.0	-
4	0.85	*0.80*	0.45	*0.40*	<0.2	-	<0.2	-				
7	0.73	*0.85*	0.85	*0.50*	0.33	*0.65*	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	13.0	-	5.1	-
18	0.72	*<0.2*	0.66	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	17.0	-	5.7	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	12.5	*3.0*	5.5	*0.7*

Table 9-652. Selected pore-water properties (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.83	*0.55*	<0.2	-	<0.2	-	<0.2	-	7.7	-	14.0	-
4	0.75	*0.70*	1.35	*0.70*	0.55	*0.20*	0.35	*<0.2*				
7	1.08	*1.55*	3.15	*0.80*	<0.2	-	<0.2	-				
11	<0.2	-	3.53	*0.45*	<0.2	-	1.24	*1.59*	13.0	-	8.6	-
18	1.17	*<0.2*	5.21	*0.56*	<0.2	-	0.93	*<0.2*				
25	<0.2	-	4.21	*1.48*	<0.2	-	3.55	*1.78*				
35	<0.2	-	10.26	*5.15*	<0.2	-	<0.2	-	14.0	-	8.5	-
136	0.31	*0.23*	10.46	*2.17*	<0.2	-	2.50	*0.59*	13.5	*1.0*	8.4	*1.0*

Table 9-653. Selected nutrients in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.120	*0.141*	0.517	*1.013*	0.031	*<0.005*	0.015	*0.030*
4	0.060	*0.080*	0.055	*0.110*	0.010	*0.020*	0.004	*0.008*
7	0.050	*0.020*	0.020	*0.040*	0.005	*0.010*	0.015	*0.030*
11	0.045	*0.030*	0.070	*0.140*	0.005	*0.010*	0.005	*0.010*
18	0.050	*0.020*	0.045	*0.010*	0.070	*0.040*	0.010	*<0.005*
25	0.375	*0.270*	0.085	*0.030*	0.230	*0.180*	<0.005	-
35	0.795	*0.230*	1.365	*2.150*	0.505	*0.190*	0.780	*1.500*
136	0.060	*0.040*	1.050	*1.040*	<0.005	-	0.005	*0.010*

Table 9-654. Selected nutrients in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.014	*0.008*	0.010	*0.020*	0.031	*<0.005*	0.040	*<0.005*
4	0.023	*0.005*	0.015	*0.010*	0.008	*0.005*	<0.005	-
7	0.120	*0.120*	0.080	*0.100*	0.015	*0.010*	0.015	*0.010*
11	0.055	*0.010*	0.040	*0.040*	0.005	*0.010*	<0.005	-
18	0.080	*0.060*	0.045	*0.010*	0.020	*0.020*	0.015	*0.010*
25	0.140	*0.080*	0.075	*0.050*	0.060	*0.080*	0.010	*<0.005*
35	0.200	*0.180*	0.985	*1.930*	0.125	*0.110*	0.590	*1.180*
136	0.135	*0.270*	0.655	*0.630*	<0.005	-	0.005	*0.010*

Table 9-655. Selected nutrients in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.039	*0.043*	0.015	*0.030*	0.027	*0.013*	0.050	*0.040*
4	0.005	*0.010*	0.005	*0.010*	0.015	*0.010*	0.015	*0.010*
7	0.100	*0.100*	0.065	*0.050*	0.005	*0.010*	0.035	*0.010*
11	0.075	*0.010*	0.050	*0.060*	<0.005	-	0.005	*0.010*
18	0.055	*0.090*	0.040	*0.020*	0.010	*<0.005*	0.045	*0.010*
25	0.065	*0.010*	0.080	*0.020*	<0.005	-	0.030	*0.020*
35	0.050	*0.020*	0.455	*0.710*	0.005	*0.010*	0.035	*0.030*
136	0.135	*0.090*	0.075	*0.030*	<0.005	-	0.015	*0.010*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-656. Selected nutrients in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.030	*0.020*	0.045	*0.070*	0.260	*0.040*	0.020	*0.020*
4	0.080	*0.020*	0.085	*0.010*	0.880	*0.940*	0.970	*0.420*
7	0.040	*<0.005*	0.035	*0.030*	2.100	*0.620*	**1.900**	*0.300*
11	0.075	*0.030*	0.050	*0.020*	**2.770**	*0.340*	**3.415**	*0.390*
18	0.135	*0.030*	0.055	*0.050*	**5.065**	*0.590*	**4.250**	*1.480*
25	0.165	*0.010*	0.075	*0.030*	**4.480**	*1.560*	**5.385**	*1.030*
35	0.180	*<0.005*	0.065	*0.030*	**4.520**	*2.120*	**4.565**	*2.190*
136	0.080	*0.040*	0.070	*0.020*	0.065	*0.010*	0.050	*<0.005*

Table 9-657. Selected nutrients in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.085	*0.090*	0.025	*0.010*	**2.400**	*2.640*	0.690	*1.360*
4	0.295	*0.010*	0.070	*0.020*	**7.545**	*0.550*	1.015	*0.470*
7	0.175	*0.090*	0.020	*<0.005*	**6.205**	*0.090*	**1.890**	*0.240*
11	0.175	*0.230*	0.060	*0.020*	**4.050**	*1.140*	**3.665**	*0.630*
18	0.230	*0.160*	0.060	*0.040*	**4.890**	*0.820*	**3.920**	*0.860*
25	0.255	*0.130*	0.070	*0.020*	**5.125**	*1.090*	**4.990**	*1.040*
35	0.175	*0.010*	0.070	*0.020*	**5.385**	*2.150*	**4.720**	*1.600*
136	0.355	*0.010*	0.055	*0.070*	1.440	*0.680*	0.900	*0.600*

Table 9-658. Selected nutrients in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.030	*0.020*	0.035	*0.030*	0.950	*0.760*	0.565	*0.790*
4	0.075	*0.030*	0.075	*0.010*	1.505	*0.410*	1.570	*0.360*
7	0.015	*0.010*	0.020	*<0.005*	2.095	*0.610*	**1.940**	*0.400*
11	0.015	*0.010*	0.040	*<0.005*	1.745	*0.490*	**3.200**	*0.280*
18	0.015	*0.010*	0.040	*<0.005*	**3.785**	*4.450*	**3.495**	*0.270*
25	0.020	*0.020*	0.050	*0.020*	**2.530**	*1.920*	**5.055**	*0.890*
35	0.050	*0.060*	0.015	*0.010*	**2.465**	*1.610*	**5.270**	*0.220*
136	0.105	*0.150*	0.020	*<0.005*	**3.295**	*1.830*	**6.240**	*0.060*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-659. Selected metals in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	<0.01	-	<0.01	-	<0.01	-	0.05	*0.03*	<0.01	-	<0.01	-
4	0.02	*<0.01*	<0.01	-	0.04	*0.02*	0.05	*0.05*	0.04	*0.03*	3.10	*0.80*
7	0.04	*0.04*	0.03	*0.02*	<0.01	-	0.34	*0.49*	0.08	*0.13*	3.67	*1.07*
11	0.02	*0.02*	<0.01	-	0.02	*0.03*	0.14	*0.11*	0.04	*0.06*	3.91	*0.49*
18	<0.01	-	0.03	*<0.01*	0.04	*0.07*	0.13	*0.07*	0.02	*<0.01*	3.59	*0.23*
25	0.03	*0.05*	<0.01	-	0.07	*0.01*	0.20	*<0.01*	0.03	*0.02*	3.67	*1.87*
35	0.01	*<0.01*	<0.01	-	0.08	*0.14*	0.09	*<0.01*	0.02	*0.03*	2.77	*3.07*
136	<0.01	-	<0.01	-	<0.01	-	0.07	*<0.01*	<0.01	-	<0.01	-

Table 9-660. Selected metals in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.03*	<0.01	-	0.10	*0.19*	1.49	*2.91*	0.62	*0.32*	1.57	*3.12*
4	0.06	*0.10*	0.01	*<0.01*	0.91	*1.13*	0.07	*0.03*	2.53	*3.75*	3.11	*0.49*
7	0.02	*<0.01*	0.02	*<0.01*	0.46	*0.33*	0.27	*0.21*	1.13	*1.09*	3.75	*1.22*
11	0.01	*<0.01*	0.02	*<0.01*	0.16	*0.10*	0.12	*0.03*	0.36	*0.06*	3.76	*1.10*
18	<0.01	-	<0.01	-	0.14	*0.05*	0.13	*0.08*	0.35	*0.04*	3.66	*0.22*
25	<0.01	-	<0.01	-	0.13	*0.06*	0.13	*<0.01*	0.33	*0.10*	3.33	*1.33*
35	<0.01	-	<0.01	-	0.18	*0.06*	0.09	*0.05*	0.47	*0.09*	2.75	*2.87*
136	0.04	*0.08*	<0.01	-	1.08	*1.93*	0.19	*0.13*	0.44	*0.25*	0.52	*0.75*

Table 9-661. Selected metals in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.01*	<0.01	-	0.44	*0.88*	0.05	*0.02*	0.53	*1.00*	0.63	*0.56*
4	0.01	*<0.01*	0.01	*<0.01*	1.68	*1.11*	2.05	*0.66*	2.22	*1.89*	3.36	*1.72*
7	0.02	*0.01*	0.02	*<0.01*	1.02	*0.95*	2.63	*0.71*	1.99	*1.20*	5.02	*2.39*
11	<0.01	-	<0.01	-	0.29	*0.26*	4.60	*0.99*	1.77	*0.74*	5.73	*2.04*
18	<0.01	-	<0.01	-	0.59	*0.12*	4.99	*0.59*	1.39	*0.25*	5.41	*0.77*
25	<0.01	-	<0.01	-	0.12	*0.04*	7.83	*2.64*	1.29	*0.09*	6.89	*0.76*
35	0.05	*0.09*	<0.01	-	0.19	*0.10*	8.21	*3.52*	1.19	*0.06*	6.50	*1.71*
136	<0.01	-	<0.01	-	0.24	*0.17*	10.77	*2.27*	0.98	*0.14*	6.60	*1.05*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-662. Selected metalloids and metals in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.41	*0.12*	<15.0	-	2.85	*1.38*	1.40	*0.10*	1.55	*0.52*	<5.0	-
4	3.19	*2.81*	19.27	*3.96*	<1.0	-	<1.0	-	1.37	*0.05*	<5.0	-
7	6.26	*2.43*	20.04	*2.69*	1.30	*1.60*	1.95	*0.04*	1.76	*0.04*	<5.0	-
11	8.12	*1.81*	37.81	*1.93*	1.70	*2.20*	<1.0	-	1.46	*0.26*	<5.0	-
18	8.91	*1.74*	47.65	*18.75*	1.40	*0.18*	<1.0	-	1.06	*0.12*	<5.0	-
25	11.09	*2.38*	67.51	*2.61*	1.50	*1.22*	<1.0	-	2.38	*0.50*	5.67	*3.89*
35	8.76	*3.70*	26.35	*1.86*	1.12	*0.02*	1.35	*0.68*	1.41	*0.09*	<5.0	-
136	21.08	*22.07*	51.49	*5.48*	<1.0	-	1.61	*0.17*	2.41	*0.58*	<5.0	-

Table 9-663. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	34.08	*49.82*	<15.0	-	<1.0	-	2.48	*0.33*	3.28	*2.08*	6.35	*4.67*
4	26.84	*2.46*	19.82	*0.47*	<1.0	-	<1.0	-	2.48	*1.77*	<5.0	-
7	21.67	*13.43*	19.15	*0.43*	<1.0	-	1.79	*1.60*	2.19	*0.63*	<5.0	-
11	16.73	*14.43*	33.05	*2.03*	<1.0	-	<1.0	-	1.78	*0.57*	<5.0	-
18	17.19	*13.49*	47.47	*4.45*	<1.0	-	<1.0	-	1.17	*0.18*	<5.0	-
25	19.68	*15.95*	70.39	*6.48*	1.01	*0.82*	<1.0	-	2.10	*0.06*	<5.0	-
35	14.66	*11.89*	22.70	*11.80*	1.28	*0.24*	1.55	*0.27*	3.28	*2.57*	<5.0	-
136	24.53	*12.23*	48.39	*6.95*	<1.0	-	<1.0	-	2.79	*1.17*	<5.0	-

Table 9-664. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	6.51	*8.44*	17.07	*27.20*	<1.0	-	2.48	*0.34*	2.70	*1.23*	7.65	*8.49*
4	5.87	*2.09*	<15.0	-	<1.0	-	<1.0	-	9.05	*8.80*	8.64	*4.87*
7	6.24	*4.16*	<15.0	-	<1.0	-	2.08	*0.15*	4.06	*2.68*	10.13	*3.93*
11	6.04	*2.88*	17.62	*18.80*	<1.0	-	<1.0	-	3.45	*0.68*	9.92	*1.84*
18	6.35	*4.38*	16.84	*16.38*	<1.0	-	<1.0	-	2.26	*0.64*	8.87	*2.19*
25	6.18	*2.22*	27.54	*27.29*	<1.0	-	1.37	*0.57*	2.74	*0.15*	9.48	*0.67*
35	2.61	*0.42*	<15.0	-	1.31	*0.24*	1.36	*0.31*	1.68	*0.54*	<5.0	-
136	1.94	*1.43*	43.04	*7.82*	<1.0	-	2.51	*0.51*	2.25	*0.43*	5.73	*0.56*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-665. Selected metals in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	11.31	*16.28*	17.48	*0.34*	<0.1	-	0.18	*<0.1*	<1.0	-	<1.0	-
4	43.60	*8.11*	27.56	*4.54*	<0.1	-	0.18	*<0.1*	<1.0	-	<1.0	-
7	31.92	*20.46*	22.31	*3.79*	<0.1	-	0.13	*<0.1*	<1.0	-	<1.0	-
11	64.47	*7.38*	17.99	*11.01*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	0.11	*<0.1*	<1.0	-	<1.0	-
25	2.39	*1.70*	6.10	*0.25*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	46.65	*41.55*	36.71	*20.12*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
136	1.90	*2.17*	<5.0	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-

Table 9-666. Selected metals in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	33.81	*7.47*	33.25	*24.42*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	47.88	*2.96*	19.46	-	<0.1	-	0.17	*<0.1*	<1.0	-	<1.0	-
7	21.15	*9.40*	**46.96**	*48.38*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
11	14.92	-	41.31	*16.01*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
25	6.01	*5.19*	10.06	*1.69*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	11.93	*17.64*	33.88	*7.37*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
136	51.68	-	<5.0	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-

Table 9-667. Selected metals in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	35.81	*16.81*	31.07	*4.05*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	37.89	*15.75*	21.68	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
7	6.01	*2.07*	15.17	*1.59*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
11	10.65	-	22.78	*11.80*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
25	5.53	*0.08*	11.40	*0.37*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	5.04	*1.43*	9.45	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
136	4.18	*1.05*	6.95	*6.72*	<0.1	-	<0.1	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-668. Selected metals in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.05	*0.09*	<4.4	-	<1.0	-	<1.0	-
11	2.07	*0.75*	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	1.08	*<1.0*	<1.0	-
25	3.18	*0.72*	4.77	*0.69*	<1.0	-	<1.0	-
35	2.72	*0.15*	<4.4	-	<1.0	-	<1.0	-
136	1.61	*0.74*	<4.4	-	<1.0	-	<1.0	-

Table 9-669. Selected metals in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.29	*0.71*	<4.4	-	<1.0	-	<1.0	-
7	1.59	*0.17*	<4.4	-	<1.0	-	<1.0	-
11	2.21	*0.48*	<4.4	-	<1.0	-	<1.0	-
18	1.30	*0.67*	<4.4	-	<1.0	-	<1.0	-
25	3.15	*0.57*	5.06	*0.74*	<1.0	-	<1.0	-
35	9.01	*10.63*	<4.4	-	<1.0	-	<1.0	-
136	2.04	*0.55*	<4.4	-	<1.0	-	<1.0	-

Table 9-670. Selected metals in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.03	*0.18*	<4.4	-	<1.0	-	<1.0	-
4	1.05	*0.52*	<4.4	-	<1.0	-	<1.0	-
7	1.72	*0.47*	<4.4	-	<1.0	-	<1.0	-
11	3.19	*0.73*	<4.4	-	<1.0	-	<1.0	-
18	1.61	*0.89*	<4.4	-	<1.0	-	<1.0	-
25	4.00	*0.07*	5.50	*0.08*	<1.0	-	<1.0	-
35	3.90	*1.36*	<4.4	-	<1.0	-	<1.0	-
136	2.07	*0.77*	<4.4	-	<1.0	-	<1.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-671. Major cations in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	106	10	10539	230	4.6	0.4	355.2	3.7	19.4	0.8	436.0	1.5
4	162	10	9810	554	8.5	1.9	372.1	20.1	26.5	0.6	478.0	5.5
7	159	9	9507	293	9.7	1.3	341.0	21.8	31.5	2.5	467.6	4.5
11	171	7	9533	639	11.0	1.8	325.7	21.3	35.7	7.9	450.5	3.0
18	154	<1	9143	420	10.5	2.0	326.7	19.2	37.1	13.4	446.4	4.1
25	183	8	9237	745	12.6	3.0	342.5	36.7	42.3	9.0	482.4	36.9
35	193	8	8973	410	12.6	3.6	338.6	17.4	42.5	8.4	472.4	39.2
136	267	12	10416	19	17.6	7.0	365.6	6.8	61.5	4.6	521.4	17.9

Table 9-672. Major cations in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	729	487	6507	6703	40.6	32.6	211.5	244.6	93.8	20.0	394.9	93.6
4	681	421	9895	397	42.0	27.1	369.6	27.3	86.1	35.8	487.9	18.2
7	448	398	9268	196	29.3	29.7	337.0	3.0	67.6	14.1	479.8	8.0
11	333	257	9099	1196	23.1	22.7	310.9	25.0	44.2	5.7	431.3	71.8
18	273	137	9378	639	19.8	14.9	336.2	20.6	47.5	17.7	453.1	9.7
25	265	127	8542	707	19.5	13.6	327.7	14.1	45.2	16.1	444.9	6.5
35	287	118	9078	307	20.3	14.5	333.3	2.5	48.2	18.4	466.9	1.8
136	301	41	9999	5	20.0	9.8	351.4	15.5	61.3	9.0	511.1	22.3

Table 9-673. Major cations in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	398	109	2614	4464	22.6	1.1	81.4	125.2	92.3	17.2	259.0	330.4
4	728	398	2219	2493	31.3	3.5	67.4	73.3	165.6	100.0	322.2	204.0
7	609	195	2787	2517	28.7	0.3	81.3	78.9	149.8	62.1	371.5	148.6
11	609	89	3822	2682	29.0	4.0	103.0	86.4	136.0	30.3	414.4	123.6
18	509	33	4276	2076	25.1	6.4	116.8	60.1	110.8	6.6	430.4	84.4
25	509	138	5208	2204	25.4	11.2	151.8	76.4	98.0	8.5	497.2	89.3
35	476	82	5598	2033	24.3	6.7	169.4	62.3	88.6	4.9	464.4	127.7
136	403	106	8916	102	21.6	9.1	286.0	6.0	73.6	3.7	556.3	34.0

Table 9-674. Major cations and anions in the surface water after inundation of the Ewe Island Barrage soil material (Site 12): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	14.3	*0.3*	1368.0	*1.2*	142	*8*	20240	*276*	61	*6*	2979	*49*
4	21.0	*1.0*	1326.4	*33.8*	221	*14*	19791	*775*	65	*16*	2877	*116*
7	20.8	*0.9*	1288.5	*73.9*	253	*11*	19792	*1754*	46	*14*	2642	*280*
11	22.9	*3.0*	1306.1	*102.6*	242	*2*	19597	*1151*	36	*11*	2620	*188*
18	24.6	*3.3*	1158.2	*37.5*	229	*2*	17402	*840*	13	*27*	2641	*143*
25	27.3	*2.6*	1199.7	*17.8*	273	*11*	18342	*2460*	25	*9*	2558	*97*
35	32.5	*0.9*	1117.6	*22.3*	282	*10*	18707	*429*	39	*2*	2744	*26*
136	48.7	*3.1*	1288.4	*23.9*	352	*6*	21082	*303*	81	*51*	2844	*36*

Table 9-675. Major cations and anions in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	99.8	*49.5*	857.4	*787.2*	1230	*956*	12782	*13086*	170	*183*	1919	*1668*
4	117.8	*14.1*	1327.1	*67.6*	1035	*594*	19343	*1566*	80	*95*	2888	*250*
7	67.2	*33.6*	1282.8	*48.1*	733	*642*	19441	*177*	30	*27*	2703	*211*
11	43.8	*23.7*	1259.4	*161.7*	477	*345*	18375	*1898*	16	*18*	2494	*198*
18	43.6	*12.9*	1164.1	*74.1*	386	*159*	18082	*710*	4	*4*	2666	*107*
25	39.0	*10.0*	1097.8	*108.4*	389	*157*	17990	*728*	15	*<1*	2430	*118*
35	47.6	*7.3*	1134.9	*43.4*	417	*145*	19353	*135*	28	*19*	2749	*225*
136	55.9	*9.6*	1253.8	*61.1*	401	*39*	20427	*186*	67	*19*	2747	*119*

Table 9-676. Major cations and anions in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	64.1	*16.3*	392.8	*657.1*	675	*150*	5233	*8870*	175	*259*	945	*1679*
4	122.0	*76.1*	355.2	*412.9*	1211	*616*	4349	*4953*	218	*360*	761	*1059*
7	91.7	*37.2*	410.4	*399.1*	1146	*289*	5672	*5131*	164	*286*	827	*1036*
11	86.9	*18.9*	537.8	*467.0*	1061	*21*	7615	*5225*	117	*171*	1023	*1096*
18	76.2	*6.3*	557.4	*306.7*	850	*162*	8347	*3782*	57	*84*	1091	*869*
25	69.3	*8.2*	661.1	*306.6*	852	*315*	10551	*5021*	32	*30*	1313	*907*
35	69.4	*1.9*	692.0	*316.5*	818	*186*	11678	*4863*	33	*14*	1487	*875*
136	64.4	*3.8*	1103.0	*70.1*	541	*119*	18639	*308*	37	*10*	2274	*169*

Table 9-677. Selected surface water properties after inundation of the Currency Creek soil material (Site 13): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.02	*1.82*	7.20	*0.91*	358	*54*	443	*197*	2.2	*0.1*	3.6	*<0.1*
4	7.16	*1.02*	6.50	*0.00*	272	*71*	406	*99*	1.6	*0.3*	2.1	*0.5*
7	6.96	*0.57*	6.34	*1.22*	545	*26*	449	*274*	1.9	*0.2*	2.2	*0.6*
11	6.53	*1.85*	6.28	*1.37*	442	*435*	371	*192*	1.3	*0.2*	1.8	*0.8*
18	6.95	*1.26*	6.25	*0.73*	288	*27*	399	*172*	0.5	*0.1*	1.0	*1.0*
25	6.63	*1.84*	5.49	*1.15*	347	*145*	402	*20*	0.5	*0.1*	0.9	*0.4*
35	6.45	*2.25*	5.17	*1.44*	378	*26*	445	*91*	0.7	*0.3*	1.0	*0.2*
136	3.52	*0.12*	3.58	*0.69*	449	*110*	533	*148*	0.0	*0.0*	0.0	*0.0*

Table 9-678. Selected pore-water properties (3-5 cm) after inundation of the Currency Creek soil material (Site 13): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.61	*0.21*	2.55	*0.33*	804	*6*	794	*28*	0.0	*0.0*	0.0	*0.0*
4	2.96	*0.15*	3.30	*0.78*	748	*23*	722	*64*	0.0	*0.0*	0.1	*0.2*
7	3.16	*0.05*	3.33	*0.52*	713	*10*	688	*24*	0.0	*0.0*	0.3	*0.6*
11	3.24	*0.27*	3.60	*0.84*	650	*26*	601	*45*	0.0	*0.0*	0.2	*0.3*
18	3.43	*0.62*	3.63	*0.27*	595	*36*	568	*72*	0.0	*0.0*	0.0	*0.0*
25	3.75	*0.06*	3.33	*0.05*	574	*3*	618	*27*	0.0	*0.0*	0.0	*0.0*
35	3.73	*0.35*	3.34	*0.06*	540	*27*	593	*4*	0.0	*0.0*	0.3	*0.1*
136	3.41	*0.02*	3.26	*0.21*	560	*5*	557	*10*	0.0	*0.0*	0.0	*0.0*

Table 9-679. Selected pore-water properties (10-12 cm) after inundation of the Currency Creek soil material (Site 13): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.44	*0.15*	2.42	*0.04*	702	*13*	713	*134*	0.0	*0.0*	0.0	*0.0*
4	2.49	*0.11*	2.36	*0.03*	659	*27*	683	*140*	0.0	*0.0*	0.0	*0.0*
7	2.53	*0.13*	2.49	*0.01*	650	*19*	654	*101*	0.0	*0.0*	0.0	*0.0*
11	2.54	*0.16*	2.55	*0.00*	615	*7*	615	*80*	0.0	*0.0*	0.0	*0.0*
18	2.66	*0.20*	2.89	*0.06*	597	*3*	607	*46*	0.0	*0.0*	0.0	*0.0*
25	2.73	*0.24*	2.67	*0.13*	582	*3*	583	*49*	0.0	*0.0*	0.0	*0.0*
35	2.63	*0.71*	2.74	*0.11*	554	*16*	563	*32*	0.0	*0.0*	0.0	*0.0*
136	3.36	*0.17*	3.08	*0.03*	511	*35*	523	*11*	0.1	*0.2*	0.0	*0.0*

Table 9-680. Selected surface water properties after inundation of the Currency Creek soil material (Site 13): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.35	*<0.2*	<0.2	-	<0.2	-	<0.2	-	18.0	-	4.2	-
4	<0.2	-	0.38	*<0.2*	<0.2	-	<0.2	-				
7	<0.2	-	0.58	*<0.2*	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	5.8	-	5.4	-
18	0.54	*<0.2*	0.55	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.7	-	4.6	-
136	<0.2	-	<0.2	-	<0.2	-	0.35	*0.32*	6.2	*0.7*	4.0	*0.4*

Table 9-681. Selected pore-water properties (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.83	*0.95*	3.00	*2.20*	9.10	*7.00*	24.13	*30.95*	n.a.	-	10.0	-
4	2.23	*1.15*	1.13	*0.55*	8.43	*3.75*	0.85	*1.70*				
7	2.25	*1.50*	1.95	*1.60*	2.85	*0.30*	<0.2	-				
11	4.88	*<0.2*	3.18	*5.15*	3.21	*0.33*	1.64	*2.09*	9.3	-	7.9	-
18	20.44	*1.00*	9.46	*11.69*	<0.2	-	0.40	*0.22*				
25	18.43	*22.22*	11.50	*12.53*	0.51	*<0.2*	1.32	*1.19*				
35	27.59	*18.32*	189.50	*368.95*	1.36	*2.09*	5.04	*8.56*	9.8	-	6.8	-
136	125.41	*38.86*	178.28	*203.23*	3.85	*3.46*	<0.2	-	9.5	*0.2*	6.8	*2.5*

Table 9-682. Selected pore-water properties (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	67.50	*19.00*	110.63	*208.75*	95.00	*74.00*	80.93	*<0.2*	n.a.	-	32.0	-
4	92.20	*67.60*	138.63	*264.75*	46.10	*20.20*	18.93	*37.85*				
7	108.70	*38.60*	157.93	*284.15*	55.80	*10.40*	4.50	*9.00*				
11	186.50	*47.00*	166.10	*263.80*	17.20	*2.93*	27.44	*20.41*	24.0	-	13.0	-
18	317.42	*45.08*	265.26	*336.03*	8.74	*5.23*	0.57	*1.14*				
25	380.04	*43.27*	308.93	*354.80*	10.98	*0.44*	4.59	*9.18*				
35	478.58	*30.86*	409.08	*351.61*	4.97	*9.94*	2.66	*5.31*	30.0	-	13.0	-
136	826.77	*1.36*	932.48	*508.97*	7.88	*2.66*	<0.2	-	29.5	*3.0*	23.5	*11.0*

Table 9-683. Selected nutrients in the surface water after inundation of the Currency Creek soil material (Site 13): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.055	*0.010*	0.065	*0.069*	0.030	*<0.005*	0.016	*0.031*
4	0.054	*0.008*	0.009	*<0.005*	0.011	*0.018*	0.001	*<0.005*
7	0.095	*0.030*	0.045	*0.010*	0.005	*0.010*	0.015	*0.010*
11	0.130	*<0.005*	0.030	*0.020*	0.005	*0.010*	<0.005	-
18	0.245	*0.230*	0.050	*0.020*	0.155	*0.250*	0.010	*0.020*
25	0.395	*0.310*	0.030	*0.060*	<0.005	-	0.020	*0.040*
35	0.690	*0.020*	0.050	*0.020*	0.005	*0.010*	<0.005	-
136	0.550	*0.240*	0.030	*0.060*	0.005	*0.010*	<0.005	-

Table 9-684. Selected nutrients in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.078	*<0.005*	0.085	*0.110*	0.032	*<0.005*	0.050	*<0.005*
4	0.070	*0.040*	0.010	*0.020*	0.010	*<0.005*	0.010	*0.020*
7	0.090	*0.020*	0.140	*0.120*	0.010	*<0.005*	0.020	*0.020*
11	0.085	*0.010*	0.035	*0.010*	0.010	*<0.005*	<0.005	-
18	0.145	*0.110*	0.025	*0.010*	0.045	*0.070*	0.005	*0.010*
25	0.295	*0.290*	0.040	*0.020*	0.005	*0.010*	0.005	*0.010*
35	0.400	*0.140*	0.080	*0.020*	<0.005	-	0.005	*0.010*
136	0.145	*0.090*	0.070	*0.060*	<0.005	-	<0.005	-

Table 9-685. Selected nutrients in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	<0.005	-	0.005	*0.010*	0.080	*0.020*	0.080	*0.020*
4	0.010	*0.020*	0.010	*0.020*	0.035	*0.010*	0.025	*0.030*
7	0.015	*0.010*	0.040	*0.080*	0.030	*<0.005*	0.015	*0.010*
11	0.020	*<0.005*	0.050	*<0.005*	0.010	*<0.005*	0.005	*0.010*
18	0.000	*<0.005*	0.000	*<0.005*	0.020	*<0.005*	0.025	*0.010*
25	0.025	*0.010*	0.025	*0.010*	0.010	*<0.005*	0.005	*0.010*
35	0.040	*0.020*	0.250	*0.440*	0.020	*<0.005*	0.020	*0.020*
136	0.195	*0.210*	0.175	*0.030*	0.005	*0.010*	0.020	*<0.005*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-686. Selected nutrients in the surface water after inundation of the Currency Creek soil material (Site 13): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.005	*0.010*	0.010	*<0.005*	0.240	*<0.005*	0.060	*0.060*
4	0.060	*<0.005*	0.065	*0.010*	0.170	*0.100*	0.540	*0.120*
7	0.010	*<0.005*	0.010	*<0.005*	0.640	*0.120*	0.675	*0.110*
11	0.005	*0.010*	0.020	*0.020*	0.375	*0.110*	1.020	*0.140*
18	0.010	*0.020*	0.015	*0.010*	0.450	*0.280*	1.040	*0.100*
25	0.015	*0.010*	0.020	*0.020*	0.315	*0.470*	1.460	*0.040*
35	0.005	*0.010*	0.010	*<0.005*	0.130	*0.100*	1.285	*0.130*
136	0.020	*<0.005*	0.020	*0.020*	1.180	*0.220*	**2.525**	*0.430*

Table 9-687. Selected nutrients in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.020	*0.020*	0.055	*0.010*	**3.275**	*2.770*	**4.120**	*3.080*
4	0.080	*0.020*	0.090	*0.020*	**3.160**	*1.780*	1.413	*0.834*
7	0.025	*0.010*	0.020	*<0.005*	**2.495**	*1.230*	1.670	*0.820*
11	0.020	*<0.005*	0.035	*0.010*	1.855	*0.190*	**1.925**	*0.570*
18	0.025	*0.010*	0.030	*<0.005*	1.865	*0.050*	**1.985**	*0.570*
25	0.020	*0.020*	0.025	*0.050*	1.200	*0.920*	**2.335**	*0.330*
35	0.015	*0.010*	0.025	*0.010*	1.180	*0.660*	**2.205**	*0.590*
136	0.040	*<0.005*	0.065	*0.070*	**2.770**	*0.060*	**4.775**	*1.590*

Table 9-688. Selected nutrients in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.095	*0.010*	0.110	*0.020*	**5.370**	*0.300*	**6.320**	*2.020*
4	0.145	*0.050*	0.135	*0.030*	**5.190**	*0.280*	**5.465**	*2.370*
7	0.090	*0.020*	0.075	*0.070*	**5.610**	*0.580*	**4.860**	*2.840*
11	0.115	*0.050*	0.110	*0.100*	**5.375**	*0.670*	**5.100**	*2.680*
18	0.140	*0.060*	0.120	*0.140*	**5.585**	*0.250*	**5.255**	*2.310*
25	0.180	*0.060*	0.190	*0.240*	**5.270**	*0.360*	**6.500**	*2.640*
35	0.195	*0.010*	0.165	*0.150*	**5.500**	*0.180*	**6.550**	*1.600*
136	0.270	*0.060*	0.225	*0.030*	**7.195**	*0.110*	**10.245**	*1.410*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-689. Selected metals in the surface water after inundation of the Currency Creek soil material (Site 13): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.06	*0.02*	0.15	*0.01*	0.10	*0.16*	0.19	*0.23*	0.04	*0.03*	0.05	*<0.01*
4	0.07	*0.06*	0.10	*<0.01*	0.15	*0.14*	0.09	*0.06*	0.07	*0.06*	0.59	*0.28*
7	0.07	*0.03*	0.08	*0.02*	0.10	*0.16*	0.11	*0.04*	0.10	*0.07*	0.79	*0.42*
11	0.05	*0.03*	0.10	*0.10*	0.08	*0.15*	0.07	*0.03*	0.09	*0.10*	0.88	*0.47*
18	0.05	*0.03*	0.32	*0.54*	0.30	*0.44*	0.15	*0.04*	0.11	*0.13*	0.99	*0.53*
25	0.04	*0.01*	1.27	*2.41*	0.22	*0.43*	0.16	*0.15*	0.11	*0.19*	1.17	*0.47*
35	0.03	*<0.01*	2.88	*5.57*	0.09	*0.13*	0.13	*0.14*	0.13	*0.24*	1.18	*0.61*
136	1.24	*0.82*	9.61	*5.16*	0.25	*0.29*	0.57	*0.57*	0.60	*0.16*	1.52	*0.18*

Table 9-690. Selected metals in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	28.39	*23.87*	41.02	*29.63*	15.09	*7.83*	24.24	*28.78*	**4.31**	*3.02*	5.17	*4.05*
4	28.02	*19.90*	4.74	*1.77*	9.92	*4.48*	1.59	*1.44*	**4.56**	*2.97*	1.18	*0.05*
7	17.94	*12.03*	5.80	*1.41*	5.71	*1.34*	2.16	*1.90*	3.08	*2.03*	1.43	*0.08*
11	11.85	*0.09*	4.48	*0.36*	8.96	*1.40*	4.50	*6.43*	2.44	*0.09*	1.37	*0.26*
18	6.67	*0.52*	4.86	*4.72*	18.57	*1.10*	8.05	*9.56*	2.07	*0.07*	1.45	*0.43*
25	4.19	*2.92*	6.05	*7.11*	18.01	*20.37*	12.44	*14.83*	1.48	*1.21*	1.76	*0.28*
35	3.67	*1.82*	5.12	*6.05*	29.21	*21.78*	18.19	*26.39*	1.71	*1.17*	1.77	*0.24*
136	4.43	*0.28*	14.19	*5.64*	127.92	*40.01*	145.16	*161.98*	2.54	*0.08*	3.72	*2.51*

Table 9-691. Selected metals in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	119.02	*7.23*	156.59	*76.75*	150.28	*12.74*	179.63	*209.54*	**16.93**	*1.67*	18.64	*6.24*
4	104.31	*17.32*	106.31	*54.07*	128.21	*46.65*	141.94	*202.48*	**14.72**	*1.90*	12.02	*6.45*
7	124.37	*14.59*	81.14	*71.67*	178.52	*40.50*	138.76	*216.62*	**16.50**	*1.45*	9.52	*8.75*
11	114.09	*4.53*	68.43	*75.34*	218.41	*37.99*	176.07	*253.57*	**15.52**	*0.98*	8.01	*8.13*
18	84.59	*0.57*	54.44	*63.23*	305.36	*5.21*	223.55	*275.58*	**15.40**	*0.63*	7.66	*7.71*
25	72.46	*2.82*	52.18	*56.66*	366.24	*46.95*	261.16	*279.99*	**14.14**	*1.19*	8.08	*7.46*
35	60.22	*3.20*	51.15	*51.20*	449.19	*56.63*	350.39	*308.08*	**14.22**	*1.28*	9.46	*7.39*
136	25.46	*2.32*	63.17	*58.30*	716.18	*0.45*	711.24	*372.19*	**10.20**	*0.28*	12.55	*8.90*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-692. Selected metalloids and metals in the surface water after inundation of the Currency Creek soil material (Site 13): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.23	*0.02*	<15.0	-	1.77	*0.13*	3.30	*0.76*	2.95	*1.64*	<5.0	-
4	<1.0	-	16.42	*3.38*	3.18	*0.08*	3.04	*1.96*	3.84	*2.88*	25.67	*14.49*
7	1.26	*0.54*	<15.0	-	2.42	*0.18*	6.69	*1.84*	5.24	*2.21*	32.95	*18.72*
11	1.38	*0.21*	17.84	*8.92*	2.44	*0.45*	5.12	*4.05*	4.85	*2.52*	34.46	*23.45*
18	<1.0	-	24.80	*4.99*	2.50	*0.02*	4.29	*3.62*	5.68	*4.07*	40.88	*24.19*
25	1.18	*0.15*	41.51	*3.39*	4.31	*1.48*	3.99	*4.84*	6.48	*5.29*	50.85	*19.74*
35	<1.0	-	<15.0	-	2.93	*0.29*	6.23	*5.88*	7.74	*6.33*	47.39	*29.90*
136	<1.0	-	41.65	*2.97*	4.80	*1.09*	**10.86**	*4.41*	27.78	*7.63*	59.03	*9.13*

Table 9-693. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	4.33	*3.86*	<15.0	-	**50.15**	*59.70*	**61.82**	*62.00*	**175.57**	*124.80*	229.36	*189.93*
4	3.40	*2.61*	19.61	*0.24*	**38.29**	*32.44*	**10.78**	*7.60*	**196.78**	*128.93*	44.69	*2.31*
7	2.54	*1.50*	<15.0	-	**22.26**	*17.84*	**12.46**	*9.01*	**128.38**	*85.52*	58.00	*8.55*
11	2.30	*1.34*	17.64	*2.42*	**14.05**	*0.02*	**8.94**	*4.97*	**101.56**	*8.05*	52.54	*20.25*
18	3.03	*1.87*	24.98	*4.45*	12.04	*3.57*	6.77	*1.39*	85.70	*2.13*	61.27	*34.04*
25	3.44	*1.81*	37.56	*8.19*	8.18	*1.50*	**8.43**	*0.84*	62.46	*41.55*	78.73	*25.24*
35	1.55	*2.06*	<15.0	-	8.74	*1.21*	**11.74**	*5.05*	69.02	*40.52*	73.35	*17.91*
136	6.93	*4.25*	61.22	*16.98*	<1.0	-	**12.71**	*4.95*	**101.95**	*2.64*	130.27	*79.03*

Table 9-694. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	9.62	*0.63*	<15.0	-	**173.90**	*89.95*	**203.33**	*2.81*	**623.46**	*52.52*	**790.82**	*264.01*
4	6.27	*0.28*	<15.0	-	**140.81**	*31.36*	**130.55**	*11.82*	**601.69**	*72.84*	512.47	*269.96*
7	7.37	*3.01*	17.52	*0.98*	**145.81**	*60.34*	**93.84**	*14.32*	**629.15**	*59.56*	396.68	*364.34*
11	10.10	*5.14*	15.72	*10.89*	**112.00**	*73.40*	**72.11**	*10.48*	**589.01**	*40.73*	314.02	*321.11*
18	17.39	*6.77*	32.87	*5.20*	**81.11**	*86.56*	**48.13**	*29.38*	**597.08**	*5.83*	304.73	*303.14*
25	20.65	*8.33*	39.97	*10.13*	**44.79**	*58.92*	**38.87**	*32.91*	**552.39**	*74.92*	333.73	*289.73*
35	20.80	*1.89*	16.69	*17.91*	**25.73**	*33.19*	**35.51**	*24.13*	**524.08**	*24.79*	382.75	*307.62*
136	70.05	*9.75*	85.13	*37.10*	<1.0	-	7.34	*9.93*	**369.35**	*66.87*	434.11	*283.51*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-695. Selected metals in the surface water after inundation of the Currency Creek soil material (Site 13): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	28.27	*5.56*	21.83	*0.95*	0.27	*0.22*	0.27	*0.37*	<1.0	-	1.38	*1.27*
4	35.70	*1.43*	**62.40**	*8.67*	0.30	*0.31*	0.57	*0.52*	1.25	*1.81*	10.40	*6.48*
7	41.26	*2.24*	**78.31**	*20.64*	0.33	*0.32*	0.57	*0.31*	1.64	*1.69*	12.86	*8.08*
11	116.22	*30.95*	**85.47**	*16.35*	0.29	*<0.1*	0.57	*0.40*	1.15	*1.67*	14.92	*9.16*
18	n.a.	-	n.a.	-	0.39	*0.32*	0.68	*0.45*	1.57	*2.39*	16.67	*9.54*
25	17.25	*0.76*	**86.89**	*48.94*	0.28	*0.41*	0.70	*0.57*	1.43	*2.26*	19.96	*10.43*
35	78.03	*5.28*	**142.87**	*27.55*	0.31	*0.30*	0.76	*0.47*	1.56	*2.54*	22.06	*13.89*
136	69.34	*10.23*	**105.04**	*12.96*	0.59	*0.33*	0.78	*0.11*	10.71	*2.56*	25.71	*4.57*

Table 9-696. Selected metals in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**396.26**	*161.77*	**388.92**	*301.10*	1.80	*1.08*	2.00	*1.50*	68.05	*46.02*	98.86	*75.87*
4	**500.16**	*165.23*	**196.27**	*86.43*	1.98	*0.94*	0.62	*<0.1*	71.58	*47.87*	19.95	*0.52*
7	**336.58**	*217.52*	**163.68**	*34.40*	1.31	*0.71*	0.60	*<0.1*	53.30	*34.90*	24.31	*1.81*
11	**363.17**	*77.67*	**253.98**	*0.83*	0.90	*0.11*	0.65	*0.19*	40.92	*4.48*	24.11	*7.76*
18	n.a.	-	n.a.	-	0.82	*0.16*	0.70	*<0.1*	34.48	*1.89*	25.55	*10.69*
25	**205.21**	*23.17*	**220.40**	*36.16*	0.67	*<0.1*	0.75	*<0.1*	25.38	*22.27*	31.99	*8.37*
35	**278.66**	*18.82*	**261.67**	*27.85*	0.52	*<0.1*	0.86	*0.14*	27.66	*18.42*	33.49	*5.93*
136	**323.67**	*29.18*	**301.39**	*122.18*	0.78	*<0.1*	1.27	*0.41*	42.11	*11.94*	56.62	*23.22*

Table 9-697. Selected metals in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	**1092.19**	*105.30*	**1133.31**	*287.63*	**4.93**	*0.12*	6.52	*2.00*	238.90	*14.77*	**342.76**	*118.28*
4	**996.95**	*38.53*	**790.43**	*333.76*	**4.75**	*0.35*	4.42	*2.90*	231.21	*36.81*	**212.06**	*111.40*
7	**970.35**	*180.39*	**633.14**	*424.39*	**5.24**	*<0.1*	3.13	*3.04*	256.21	*23.45*	**163.88**	*146.67*
11	**995.71**	*155.22*	**758.09**	*421.94*	**4.95**	*0.21*	3.01	*3.00*	241.72	*13.55*	146.08	*146.84*
18	n.a.	-	n.a.	-	**4.87**	*0.88*	2.84	*2.58*	235.92	*3.43*	129.89	*126.63*
25	**854.16**	*85.00*	**689.23**	*307.74*	4.32	*<0.1*	2.95	*2.46*	226.54	*12.85*	140.49	*115.83*
35	**1011.01**	*162.35*	**775.51**	*309.54*	3.82	*0.12*	3.69	*2.82*	211.71	*7.53*	**169.85**	*120.27*
136	**826.72**	*70.00*	**744.67**	*177.30*	1.57	*1.06*	3.23	*1.39*	132.70	*95.16*	**158.27**	*20.84*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-698. Selected metals in the surface water after inundation of the Currency Creek soil material (Site 13): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.12	*2.24*	<4.4	-	1.08	*2.16*	1.17	*2.34*
4	1.98	*3.08*	<4.4	-	1.49	*2.85*	1.75	*2.83*
7	1.72	*1.41*	<4.4	-	1.27	*1.91*	1.56	*1.18*
11	1.30	*0.87*	<4.4	-	<1.0	-	1.01	*1.96*
18	1.70	*1.87*	<4.4	-	1.58	*1.99*	2.20	*2.98*
25	2.00	*2.33*	<4.4	-	1.08	*1.95*	1.49	*2.63*
35	2.19	*0.17*	<4.4	-	<1.0	-	<1.0	-
136	1.71	*1.87*	5.54	*3.86*	<1.0	-	1.27	*<1.0*

Table 9-699. Selected metals in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	39.41	*35.54*	64.35	*54.73*	<1.0	-	<1.0	-
4	39.87	*30.97*	6.55	*4.93*	<1.0	-	<1.0	-
7	20.81	*13.31*	7.02	*4.05*	<1.0	-	<1.0	-
11	13.44	*2.06*	6.32	*2.24*	<1.0	-	<1.0	-
18	8.81	*3.39*	5.95	*0.10*	1.14	*<1.0*	1.43	*<1.0*
25	4.38	*2.29*	6.76	*0.37*	<1.0	-	1.09	*<1.0*
35	4.20	*2.00*	<4.4	-	<1.0	-	1.40	*<1.0*
136	2.46	*0.21*	5.02	*3.40*	1.21	*<1.0*	6.56	*6.80*

Table 9-700. Selected metals in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	**140.38**	*17.72*	**215.00**	*102.17*	<1.0	-	<1.0	-
4	**136.12**	*13.73*	**137.30**	*77.05*	<1.0	-	1.49	*<1.0*
7	**144.27**	*7.99*	**105.30**	*91.71*	1.02	*<1.0*	1.49	*<1.0*
11	**121.56**	*4.17*	79.60	*76.35*	<1.0	-	1.88	*<1.0*
18	**114.09**	*26.73*	63.85	*64.27*	1.75	*<1.0*	3.79	*<1.0*
25	**87.62**	*21.24*	56.16	*46.19*	<1.0	-	2.92	*2.02*
35	**67.20**	*25.27*	54.89	*40.79*	1.77	*<1.0*	4.43	*2.23*
136	10.10	*3.73*	12.91	*8.98*	2.98	*1.56*	**13.16**	*<1.0*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-701. Major cations in the surface water after inundation of the Currency Creek soil material (Site 13): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	107	*4*	10263	*244*	4.6	*0.2*	364.6	*10.0*	21.3	*1.8*	432.3	*10.6*
4	130	*19*	9943	*142*	5.3	*1.0*	371.0	*0.6*	27.0	*2.6*	498.6	*3.5*
7	123	*5*	9377	*355*	5.9	*0.1*	351.6	*3.7*	30.6	*0.3*	464.9	*12.9*
11	132	*2*	9572	*585*	6.1	*0.6*	338.1	*14.9*	29.7	*0.3*	448.5	*26.2*
18	117	*23*	8870	*287*	5.7	*1.1*	343.9	*4.6*	29.3	*1.4*	435.0	*10.7*
25	132	*34*	10178	*903*	6.4	*1.9*	381.7	*38.5*	30.0	*3.4*	494.2	*37.4*
35	156	*26*	8821	*451*	7.4	*1.7*	348.2	*8.9*	29.9	*3.4*	447.3	*8.9*
136	258	*25*	10490	*433*	18.0	*2.3*	388.4	*8.5*	45.4	*0.8*	488.0	*8.5*

Table 9-702. Major cations in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	588	*290*	8052	*1525*	29.3	*16.6*	278.8	*53.1*	151.3	*29.1*	490.3	*59.3*
4	688	*372*	9313	*401*	30.4	*16.9*	343.4	*20.2*	182.0	*15.7*	489.3	*25.2*
7	454	*166*	9218	*74*	21.1	*9.7*	339.4	*3.2*	120.0	*38.3*	475.5	*22.5*
11	415	*36*	9360	*327*	18.6	*0.6*	329.2	*23.3*	96.6	*17.2*	457.5	*25.4*
18	308	*8*	8369	*145*	14.4	*<0.1*	317.9	*9.9*	81.0	*15.7*	433.4	*16.9*
25	271	*126*	9597	*1480*	14.2	*6.5*	343.3	*32.9*	62.4	*18.7*	517.9	*102.2*
35	305	*130*	8676	*271*	16.6	*9.1*	341.7	*0.5*	61.0	*21.9*	439.1	*21.4*
136	401	*33*	9575	*279*	36.5	*4.5*	376.0	*9.5*	86.6	*1.4*	485.4	*13.9*

Table 9-703. Major cations in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1564	*81*	2400	*693*	96.1	*14.7*	105.7	*35.5*	407.7	*17.4*	472.8	*55.6*
4	1808	*344*	5286	*1460*	91.2	*31.0*	195.7	*34.0*	416.0	*25.3*	513.3	*6.6*
7	1652	*277*	6153	*1821*	88.6	*21.9*	223.6	*35.4*	433.8	*31.9*	483.7	*25.8*
11	1629	*126*	6453	*1837*	88.6	*21.9*	230.7	*45.2*	401.6	*3.2*	465.4	*10.9*
18	1228	*190*	5585	*1571*	76.0	*21.7*	211.9	*22.0*	378.9	*9.7*	418.6	*13.8*
25	1192	*240*	6553	*289*	78.4	*22.8*	243.2	*18.3*	342.7	*18.4*	468.3	*44.7*
35	1146	*190*	6078	*948*	76.8	*21.1*	248.5	*4.0*	301.3	*4.9*	467.1	*15.9*
136	860	*75*	7303	*891*	91.6	*14.2*	321.3	*14.2*	241.1	*14.0*	508.0	*42.1*

Table 9-704. Major cations and anions in the surface water after inundation of the Currency Creek soil material (Site 13): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	15.8	*0.5*	1355.6	*73.4*	133	*1*	20246	*97*	36	*25*	2959	*15*
4	19.2	*2.1*	1318.0	*6.2*	195	*21*	19537	*<1*	76	*40*	3179	*282*
7	17.6	*1.9*	1302.1	*3.2*	183	*15*	19704	*154*	77	*38*	2853	*68*
11	18.1	*0.8*	1357.2	*69.9*	179	*35*	19675	*739*	86	*46*	2819	*44*
18	17.0	*4.6*	1084.4	*17.6*	167	*22*	17316	*208*	98	*46*	2774	*130*
25	18.5	*5.5*	1248.9	*132.6*	191	*41*	18705	*911*	99	*73*	3152	*79*
35	22.6	*6.2*	1113.2	*22.1*	228	*33*	19468	*95*	151	*53*	3128	*238*
136	42.0	*7.5*	1349.6	*11.1*	330	*17*	20895	*58*	323	*40*	3465	*37*

Table 9-705. Major cations and anions in the pore-water (3-5 cm) after inundation of the Currency Creek soil material (Site 13): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	158.8	*79.9*	1122.4	*107.2*	658	*372*	15257	*3693*	1364	*759*	4029	*988*
4	200.5	*108.1*	1228.4	*51.2*	737	*333*	18274	*841*	1846	*1052*	3177	*5*
7	115.5	*47.5*	1273.8	*54.1*	516	*222*	18922	*261*	1021	*601*	3027	*159*
11	101.0	*22.0*	1353.6	*37.6*	434	*6*	18727	*554*	859	*33*	2992	*1*
18	74.4	*6.3*	1033.1	*17.3*	348	*3*	16627	*124*	674	*33*	2939	*50*
25	57.0	*34.0*	1230.3	*270.2*	325	*125*	17859	*1514*	505	*361*	3288	*428*
35	68.8	*38.1*	1097.4	*11.0*	368	*132*	18861	*134*	586	*335*	3179	*95*
136	106.5	*8.4*	1277.3	*50.1*	437	*42*	19056	*968*	1014	*25*	3747	*566*

Table 9-706. Major cations and anions in the pore-water (10-12 cm) after inundation of the Currency Creek soil material (Site 13): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	543.4	*44.8*	671.7	*203.1*	1791	*182*	3131	*945*	4469	*310*	5991	*1796*
4	565.3	*59.7*	960.4	*32.0*	1930	*392*	9170	*3618*	5296	*599*	5178	*1229*
7	555.3	*30.8*	1049.6	*96.3*	1902	*435*	11829	*4240*	4557	*504*	4414	*1548*
11	561.9	*6.6*	1139.1	*136.0*	1616	*365*	12484	*4647*	4398	*492*	4193	*1157*
18	424.4	*48.8*	839.6	*76.7*	1377	*259*	10415	*3491*	4311	*289*	4014	*1437*
25	402.0	*44.0*	978.9	*29.2*	1335	*254*	11524	*1305*	3943	*470*	4422	*1792*
35	398.1	*52.0*	970.7	*55.8*	1306	*169*	12433	*2508*	4082	*362*	4842	*1599*
136	339.3	*31.5*	1105.4	*42.0*	764	*97*	14340	*2177*	3765	*43*	4953	*1722*

Table 9-707. Selected surface water properties after inundation of the Poltalloch Station soil material (Site 14): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.11	*0.02*	6.55	*0.06*	529	*16*	452	*304*	2.3	*0.1*	3.5	*0.2*
4	6.46	*0.02*	6.05	*0.02*	353	*190*	430	*57*	1.7	*0.3*	2.0	*0.4*
7	6.48	*0.25*	5.58	*0.14*	381	*16*	366	*118*	2.6	*1.2*	2.0	*0.3*
11	5.86	*0.19*	5.06	*0.37*	337	*12*	414	*20*	1.4	*0.1*	1.3	*0.3*
18	6.17	*1.10*	4.30	*0.43*	273	*12*	534	*4*	0.6	*0.1*	0.3	*0.1*
25	5.64	*0.20*	3.88	*0.74*	298	*29*	619	*128*	0.4	*<0.1*	0.3	*0.4*
35	4.80	*0.98*	3.46	*0.64*	423	*56*	624	*78*	0.4	*0.3*	0.4	*0.7*
136	3.05	*0.18*	2.96	*0.27*	602	*123*	652	*21*	0.0	*0.0*	0.0	*0.0*

Table 9-708. Selected pore-water properties (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.45	*<0.01*	2.61	*0.19*	805	*3*	788	*14*	0.0	*0.0*	0.0	*0.0*
4	3.01	*0.38*	3.22	*0.37*	636	*14*	592	*62*	0.0	*0.0*	0.0	*0.1*
7	3.46	*0.86*	4.49	*0.74*	543	*9*	416	*27*	0.1	*0.2*	1.1	*0.1*
11	4.52	*2.29*	4.49	*0.87*	401	*156*	377	*108*	0.3	*0.5*	1.1	*1.0*
18	4.23	*0.21*	4.46	*1.84*	451	*78*	532	*90*	0.3	*0.5*	0.8	*1.7*
25	4.68	*1.16*	4.57	*2.09*	409	*228*	368	*180*	0.7	*1.3*	0.9	*1.3*
35	4.66	*1.77*	4.61	*1.41*	370	*273*	380	*128*	1.6	*2.7*	1.3	*0.7*
136	3.93	*1.74*	3.46	*0.36*	459	*269*	419	*27*	0.5	*0.9*	0.2	*0.5*

Table 9-709. Selected pore-water properties (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2.22	*<0.01*	2.26	*0.16*	709	*3*	805	*5*	0.0	*0.0*	0.0	*0.0*
4	2.31	*0.01*	2.21	*0.14*	632	*1*	690	*6*	0.0	*0.0*	0.0	*0.0*
7	2.38	*0.02*	2.35	*0.13*	604	*10*	641	*8*	0.0	*0.0*	0.0	*0.0*
11	2.42	*0.03*	2.45	*0.13*	569	*19*	580	*17*	0.0	*0.0*	0.0	*0.0*
18	2.60	*0.03*	2.91	*0.17*	572	*22*	561	*15*	0.0	*0.0*	0.0	*0.0*
25	2.72	*0.02*	2.77	*0.19*	561	*21*	535	*7*	0.0	*0.0*	0.0	*0.0*
35	2.90	*0.06*	2.97	*0.23*	540	*16*	508	*14*	0.0	*0.0*	0.0	*0.0*
136	4.66	*0.69*	3.95	*0.26*	380	*107*	344	*27*	1.7	*0.6*	0.9	*0.1*

Table 9-710. Selected surface water properties after inundation of the Poltalloch Station soil material (Site 14): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.43	*0.35*	<0.2	-	<0.2	-	<0.2	-	9.5	-	4.9	-
4	0.23	*0.45*	1.28	*0.35*	<0.2	-	<0.2	-				
7	<0.2	-	3.08	*4.35*	<0.2	-	<0.2	-				
11	<0.2	-	1.85	*2.20*	<0.2	-	0.85	*0.68*	7.7	-	6.9	-
18	0.79	*0.43*	0.99	*0.75*	<0.2	-	<0.2	-				
25	0.77	*1.48*	0.29	*0.41*	<0.2	-	0.93	*1.65*				
35	1.08	*2.15*	0.64	*0.95*	<0.2	-	2.46	*4.38*	5.7	-	7.6	-
136	0.41	*<0.2*	0.53	*0.46*	1.23	*0.98*	3.87	*4.78*	6.1	*0.5*	7.8	*2.1*

Table 9-711. Selected pore-water properties (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3.75	*7.50*	4.88	*2.05*	20.00	*4.20*	18.05	*22.20*	41.0	-	34.0	-
4	42.30	*31.80*	54.15	*83.70*	7.70	*4.20*	<0.2	-				
7	95.50	*133.00*	37.60	*58.80*	30.00	*22.00*	<0.2	-				
11	192.67	*332.67*	112.00	*96.00*	12.96	*17.67*	18.87	*3.43*	12.0	-	21.0	-
18	330.39	*389.23*	264.99	*8.91*	0.28	*0.56*	<0.2	-				
25	304.86	*448.41*	312.47	*65.17*	1.72	*1.72*	11.34	*22.68*				
35	361.52	*428.61*	372.70	*85.78*	18.16	*22.64*	3.52	*7.04*	23.0	-	44.0	-
136	311.14	*309.78*	531.39	*231.25*	7.02	*14.03*	<0.2	-	34.5	*37.0*	42.5	*23.0*

Table 9-712. Selected pore-water properties (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	10.38	*5.85*	9.85	*4.00*	109.93	*29.25*	93.58	*117.15*	64.0	-	48.0	-
4	261.00	*26.00*	80.70	*70.60*	27.00	*6.00*	20.50	*41.00*				
7	314.00	*72.00*	87.08	*145.85*	27.00	*54.00*	<0.2	-				
11	447.00	*24.00*	285.50	*143.00*	4.74	*9.48*	46.65	*18.24*	69.0	-	42.0	-
18	626.84	*36.96*	497.75	*205.49*	3.58	*0.53*	21.45	*42.90*				
25	737.25	*68.10*	574.73	*128.19*	2.22	*4.44*	<0.2	-				
35	931.68	*24.35*	743.14	*240.64*	1.55	*3.11*	7.55	*15.10*	88.0	-	63.0	-
136	1455.17	*176.63*	1094.03	-	11.11	*22.22*	n.a.	-	120.0	*20.0*	89.5	*1.0*

Table 9-713. Selected nutrients in the surface water after inundation of the Poltalloch Station soil material (Site 14): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.054	*0.013*	0.035	*0.050*	0.027	*0.013*	0.015	*0.030*
4	0.055	*0.030*	0.020	*0.040*	0.015	*0.010*	0.005	*0.010*
7	0.115	*0.010*	0.090	*0.060*	0.010	*<0.005*	0.015	*0.030*
11	0.170	*<0.005*	0.085	*0.050*	0.025	*0.030*	<0.005	-
18	0.465	*0.610*	0.030	*<0.005*	0.520	*0.880*	0.020	*0.020*
25	0.860	*1.120*	0.075	*0.030*	0.475	*0.710*	0.005	*0.010*
35	1.170	*0.800*	0.280	*0.320*	0.545	*0.290*	0.015	*0.030*
136	0.060	*0.040*	0.040	*0.020*	<0.005	-	<0.005	-

Table 9-714. Selected nutrients in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.140	*0.020*	0.083	*0.006*	0.030	*0.020*	0.042	*0.016*
4	0.040	*<0.005*	0.025	*0.050*	<0.005	-	0.005	*0.010*
7	0.030	*0.020*	0.045	*0.030*	0.010	*<0.005*	0.020	*0.020*
11	0.110	*0.080*	0.085	*0.090*	0.010	*0.020*	<0.005	-
18	0.135	*0.250*	0.080	*0.020*	0.190	*0.300*	0.015	*0.010*
25	0.405	*0.650*	0.070	*0.020*	0.210	*0.340*	0.030	*0.020*
35	0.385	*0.270*	0.180	*0.220*	0.185	*0.010*	0.035	*0.010*
136	0.080	*0.080*	0.210	*0.020*	0.010	*0.020*	0.015	*0.010*

Table 9-715. Selected nutrients in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	<0.005	-	0.085	*0.170*	0.110	*0.060*	0.100	*0.080*
4	<0.005	-	0.010	*0.020*	0.030	*0.000*	0.025	*0.030*
7	0.025	*0.010*	0.195	*0.230*	0.025	*0.010*	0.055	*0.010*
11	0.035	*0.010*	0.020	*0.040*	0.010	*<0.005*	<0.005	-
18	0.050	*<0.005*	0.045	*0.010*	0.020	*<0.005*	0.030	*<0.005*
25	0.115	*0.050*	0.025	*0.030*	0.020	*<0.005*	0.025	*0.010*
35	0.120	*0.080*	0.055	*0.030*	0.030	*<0.005*	0.040	*<0.005*
136	0.275	*0.130*	0.260	*0.020*	0.065	*0.030*	0.045	*0.010*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-716. Selected nutrients in the surface water after inundation of the Poltalloch Station soil material (Site 14): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.010	*<0.005*	0.007	*0.007*	0.530	*0.380*	0.295	*0.210*
4	0.075	*0.030*	0.070	*<0.005*	0.515	*0.270*	1.490	*0.360*
7	0.005	*0.010*	0.015	*0.010*	1.020	*0.060*	**1.800**	*0.020*
11	0.010	*<0.005*	0.040	*0.040*	0.860	*0.080*	**2.500**	*0.060*
18	0.005	*0.010*	0.035	*0.050*	0.965	*0.570*	**2.800**	*0.340*
25	0.020	*0.020*	0.045	*0.030*	0.925	*1.330*	**3.815**	*0.270*
35	0.015	*0.010*	0.030	*<0.005*	1.255	*1.170*	**3.905**	*0.630*
136	0.010	*<0.005*	0.025	*0.010*	**5.375**	*0.570*	**6.420**	*1.560*

Table 9-717. Selected nutrients in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.055	*0.050*	0.015	*0.030*	**14.600**	*4.620*	**13.090**	*2.240*
4	0.080	*0.020*	0.140	*0.120*	**8.265**	*6.610*	**4.580**	*1.040*
7	0.040	*0.060*	0.305	*0.470*	**7.310**	*7.020*	**8.280**	*4.940*
11	0.705	*1.410*	0.445	*0.430*	**6.280**	*8.120*	**8.645**	*5.610*
18	0.550	*1.020*	0.525	*0.850*	**10.230**	*6.320*	**9.330**	*0.760*
25	0.060	*0.100*	0.460	*0.760*	**7.990**	*11.180*	**10.615**	*1.930*
35	0.090	*0.060*	0.135	*0.150*	**10.020**	*12.140*	**9.405**	*0.030*
136	0.305	*0.390*	0.695	*0.410*	**8.050**	*3.840*	**10.825**	*2.670*

Table 9-718. Selected nutrients in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.070	*0.020*	0.065	*0.030*	**19.030**	*1.700*	**16.615**	*3.230*
4	0.120	*<0.005*	0.135	*0.010*	**17.335**	*1.690*	**14.800**	*2.240*
7	0.090	*0.020*	0.080	*0.020*	**17.290**	*1.140*	**13.725**	*2.290*
11	0.215	*0.150*	0.290	*0.260*	**16.885**	*1.110*	**16.050**	*3.580*
18	0.240	*0.200*	0.730	*0.760*	**16.900**	*1.680*	**14.605**	*4.250*
25	0.310	*0.240*	0.865	*0.610*	**17.310**	*1.280*	**17.090**	*3.140*
35	0.245	*0.150*	0.490	*0.040*	**18.110**	*1.880*	**16.505**	*4.010*
136	0.305	*0.050*	0.445	*0.010*	**19.485**	*0.010*	**20.520**	*4.980*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-719. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 14): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.09	*0.05*	0.15	*0.05*	0.23	*0.10*	0.37	*0.21*	0.02	*0.01*	0.03	*<0.01*
4	0.10	*0.03*	0.10	*0.04*	0.31	*0.24*	0.35	*0.22*	0.03	*0.02*	0.23	*0.05*
7	0.06	*<0.01*	0.08	*0.04*	0.31	*0.02*	1.40	*1.97*	0.06	*<0.01*	0.37	*0.16*
11	0.06	*0.03*	0.20	*0.03*	0.21	*0.16*	2.96	*2.56*	0.06	*<0.01*	0.43	*0.22*
18	0.04	*<0.01*	1.81	*0.80*	0.86	*0.17*	0.95	*0.90*	0.09	*0.02*	0.48	*0.20*
25	0.02	*0.02*	3.88	*0.06*	1.30	*1.41*	1.52	*2.03*	0.12	*0.04*	0.57	*0.23*
35	0.03	*0.03*	4.91	*0.60*	1.30	*2.03*	2.98	*4.81*	0.16	*0.08*	0.64	*0.11*
136	1.46	*0.48*	7.49	*0.28*	1.69	*0.67*	4.24	*4.41*	0.41	*0.16*	0.74	*0.10*

Table 9-720. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	39.89	*10.06*	41.61	*9.61*	36.47	*14.85*	22.04	*21.48*	3.39	*1.32*	1.96	*0.14*
4	12.67	*8.05*	4.69	*5.69*	46.22	*32.36*	31.96	*40.51*	1.38	*0.76*	0.48	*0.30*
7	9.64	*11.24*	2.01	*2.39*	151.14	*198.83*	84.15	*69.88*	1.24	*1.26*	0.56	*0.24*
11	2.75	*4.73*	1.88	*3.02*	219.69	*367.93*	118.56	*87.25*	0.80	*1.09*	0.67	*0.47*
18	1.31	*0.69*	4.31	*8.08*	336.51	*419.96*	232.34	*0.66*	1.03	*0.70*	1.02	*0.90*
25	0.31	*0.33*	4.40	*8.32*	342.55	*523.44*	299.24	*133.11*	0.87	*0.94*	1.25	*1.09*
35	0.23	*0.30*	2.05	*3.23*	373.74	*448.92*	301.99	*122.14*	0.96	*0.79*	1.19	*0.65*
136	0.98	*1.56*	7.02	*2.95*	265.73	*249.43*	436.22	*191.74*	0.89	*0.73*	1.45	*0.74*

Table 9-721. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	101.29	*21.71*	84.73	*38.30*	184.57	*43.16*	102.17	*117.82*	**8.67**	*0.16*	6.40	*3.10*
4	86.39	*6.79*	62.24	*17.33*	254.09	*17.60*	100.55	*68.82*	**7.71**	*1.31*	4.45	*1.32*
7	91.29	*17.26*	59.39	*13.87*	406.11	*41.19*	190.84	*109.10*	**8.49**	*0.34*	4.64	*1.04*
11	82.09	*2.61*	52.92	*20.92*	544.32	*97.41*	313.39	*167.25*	**8.20**	*2.24*	4.20	*1.79*
18	43.42	*6.37*	35.27	*22.61*	630.16	*23.11*	448.39	*160.87*	**7.14**	*0.44*	3.48	*1.89*
25	36.69	*4.02*	26.71	*19.73*	768.21	*22.25*	536.76	*168.77*	**6.93**	*0.91*	3.31	*1.70*
35	26.20	*2.14*	16.88	*16.15*	943.69	*74.68*	641.15	*147.01*	**6.98**	*0.95*	3.26	*1.37*
136	0.45	*0.33*	0.65	*1.02*	1291.38	*57.59*	1009.92	*283.07*	**4.18**	*0.70*	2.83	*1.64*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-722. Selected metalloids and metals in the surface water after inundation of the Poltalloch Station soil material (Site 14): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.14	*0.49*	<15.0	-	**23.35**	*43.07*	3.80	*0.01*	2.22	*0.78*	<5.0	-
4	<1.0	-	15.27	*6.41*	**25.08**	*45.91*	**18.60**	*26.07*	2.23	*0.12*	11.28	*0.03*
7	<1.0	-	<15.0	-	**56.71**	*107.51*	**20.49**	*21.05*	3.46	*0.34*	17.80	*4.77*
11	<1.0	-	<15.0	-	**52.96**	*101.25*	**19.05**	*20.97*	3.49	*0.55*	19.82	*7.93*
18	<1.0	-	25.76	*3.26*	**45.92**	*86.08*	**22.07**	*29.16*	3.87	*0.07*	21.05	*10.23*
25	1.45	*1.29*	34.39	*0.19*	**50.38**	*96.48*	**26.77**	*38.22*	4.94	*1.20*	27.40	*12.21*
35	<1.0	-	<15.0	-	**93.92**	*182.39*	**32.51**	*42.54*	5.38	*1.51*	24.21	*6.27*
136	1.59	*1.04*	40.79	*6.72*	**316.57**	*626.42*	**25.67**	*20.20*	11.12	*0.11*	26.07	*4.19*

Table 9-723. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	11.95	*4.64*	<15.0	-	**1820.88**	*3470.03*	**403.71**	*659.54*	**163.21**	*32.34*	111.66	*18.79*
4	6.58	*4.56*	20.04	*3.82*	**623.41**	*1196.86*	**35.64**	*35.71*	69.04	*38.20*	16.27	*18.11*
7	14.95	*21.71*	37.87	*16.08*	**412.35**	*799.29*	**9.64**	*4.26*	54.79	*50.59*	15.10	*13.96*
11	54.26	*97.16*	52.88	*30.06*	**135.73**	*263.70*	4.85	*3.40*	33.26	*43.24*	16.74	*25.15*
18	53.76	*64.01*	88.45	*26.68*	**26.30**	*41.72*	4.00	*1.41*	35.17	*12.58*	32.91	*52.00*
25	38.86	*47.28*	84.10	*40.37*	11.68	*12.54*	3.44	*0.84*	22.51	*12.53*	38.83	*55.52*
35	27.56	*10.96*	41.33	*40.26*	6.98	*3.28*	5.25	*0.27*	15.51	*6.02*	30.76	*35.46*
136	10.31	*0.06*	66.10	*7.85*	1.17	*2.33*	**12.43**	*4.24*	9.93	*3.64*	28.16	*30.25*

Table 9-724. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	19.19	*3.50*	<15.0	-	**380.88**	*194.33*	**1482.49**	*2706.82*	**401.05**	*68.61*	310.26	*134.34*
4	18.07	*5.24*	<15.0	-	**405.01**	*433.49*	**977.79**	*1691.79*	**366.53**	*24.26*	218.58	*47.03*
7	37.60	*5.49*	19.14	*0.02*	**472.06**	*625.75*	**849.30**	*1399.39*	**385.07**	*58.59*	218.36	*42.57*
11	65.71	*22.95*	37.91	*7.24*	**557.15**	*938.76*	**610.68**	*1028.54*	**368.47**	*35.67*	183.59	*78.21*
18	93.79	*32.67*	91.28	*13.53*	**435.42**	*780.26*	**290.06**	*516.45*	**317.52**	*10.14*	148.66	*78.37*
25	113.19	*37.23*	118.48	*15.87*	**398.58**	*774.64*	**125.64**	*226.85*	**302.74**	*2.73*	141.33	*73.70*
35	132.74	*31.05*	86.05	*8.26*	**180.79**	*349.28*	**22.40**	*26.99*	**286.27**	*6.84*	132.49	*60.62*
136	21.03	*4.63*	66.55	*16.82*	2.14	*4.28*	**9.62**	*1.27*	58.67	*29.31*	42.18	*59.96*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-725. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 14): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	71.77	80.66	24.33	3.77	0.27	0.18	<0.1	-	<1.0	-	<1.0	-
4	135.42	75.22	**102.90**	21.12	0.29	<0.1	0.27	0.10	<1.0	-	11.21	1.07
7	**181.33**	283.93	**86.86**	37.89	0.26	0.16	0.23	<0.1	2.07	0.59	16.40	5.73
11	**181.48**	202.65	**101.87**	54.81	0.31	0.14	0.25	<0.1	2.22	0.70	20.70	9.90
18	n.a.	-	n.a.	-	0.29	0.33	0.26	<0.1	3.17	1.01	22.92	9.82
25	**245.48**	448.57	**122.81**	83.09	0.30	0.32	0.32	<0.1	4.10	1.02	27.05	10.44
35	**383.24**	610.80	**169.32**	121.43	0.37	0.25	0.32	<0.1	4.92	1.24	33.10	4.28
136	**608.61**	1108.87	**141.03**	134.69	0.45	0.58	0.28	0.11	13.87	1.92	34.69	6.30

Table 9-726. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	**1078.16**	1325.62	**490.14**	482.29	1.99	0.74	1.21	0.56	166.58	36.53	115.36	18.63
4	**832.97**	723.85	**236.42**	60.13	1.35	0.65	0.39	<0.1	67.14	41.26	22.05	15.33
7	**607.48**	855.95	**176.41**	79.26	0.90	0.66	0.27	<0.1	59.67	60.69	23.55	10.07
11	**649.43**	826.24	**222.96**	20.04	0.53	0.43	0.26	0.19	37.56	51.51	29.34	23.03
18	n.a.	-	n.a.	-	0.46	0.14	0.32	0.13	44.60	25.59	47.22	51.48
25	**241.74**	208.81	**207.06**	158.18	0.33	<0.1	0.35	0.26	32.85	30.73	56.06	56.09
35	**239.48**	51.99	**277.22**	87.89	0.16	<0.1	0.38	<0.1	32.32	14.64	57.61	35.00
136	156.86	0.30	**329.00**	304.48	0.14	<0.1	0.17	0.15	22.27	1.42	62.90	45.44

Table 9-727. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	**867.05**	28.33	**1517.85**	2358.54	2.81	0.38	2.40	1.86	423.94	52.26	**341.96**	151.45
4	**947.19**	279.77	**1056.58**	1348.65	2.40	0.45	1.60	0.47	390.81	7.91	**235.41**	57.77
7	**954.96**	668.70	**1099.13**	1278.33	2.62	0.69	1.61	0.92	452.28	53.51	**239.70**	46.75
11	**1345.06**	1138.89	**1208.75**	1541.34	2.99	1.92	1.74	1.20	421.92	49.31	**219.25**	88.91
18	n.a.	-	n.a.	-	2.73	1.95	1.28	1.07	360.88	24.54	**176.03**	94.21
25	**2004.85**	2685.69	**979.37**	1034.35	3.15	2.50	1.16	1.10	345.95	19.09	**169.70**	83.29
35	**2668.15**	3780.36	**883.50**	626.70	3.70	3.87	0.96	0.83	333.13	15.88	**176.48**	78.32
136	**554.80**	337.79	**422.24**	453.42	0.89	1.68	0.19	<0.1	151.42	19.08	115.62	94.59

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-728. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	<1.0	-	<4.4	-	<1.0	-	<1.0	-
11	1.28	*1.10*	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	<1.0	-	<1.0	-
25	1.17	*0.77*	<4.4	-	<1.0	-	<1.0	-
35	1.24	*0.05*	<4.4	-	<1.0	-	1.21	*<1.0*
136	1.93	*1.20*	4.91	*2.42*	2.18	*2.28*	1.65	*1.54*

Table 9-729. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	**91.12**	*34.80*	79.26	*24.42*	**377.59**	*754.35*	4.63	*5.37*
4	30.17	*20.65*	6.36	*9.19*	53.43	*105.04*	4.45	*4.28*
7	20.77	*26.38*	<4.4	-	36.97	*72.24*	3.15	*3.20*
11	11.69	*20.44*	4.54	*6.51*	24.25	*47.91*	3.27	*1.82*
18	8.92	*5.80*	8.53	*16.77*	17.69	*33.22*	7.15	*4.34*
25	4.62	*4.54*	7.74	*15.48*	3.80	*7.11*	6.22	*5.91*
35	4.94	*2.67*	<4.4	-	2.31	*3.24*	6.22	*5.16*
136	3.57	*1.33*	<4.4	-	1.38	*1.74*	**16.49**	*1.51*

Table 9-730. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	**184.09**	*20.09*	**166.85**	*101.85*	3.11	*3.73*	2.67	*<1.0*
4	**165.71**	*2.67*	**116.83**	*48.95*	2.16	*<1.0*	**23.91**	*39.71*
7	**167.66**	*20.66*	**112.61**	*32.58*	2.75	*<1.0*	10.07	*11.23*
11	**145.48**	*16.93*	**99.01**	*43.72*	5.54	*<1.0*	6.82	*4.64*
18	**112.22**	*10.54*	77.28	*46.70*	9.26	*<1.0*	**15.43**	*2.84*
25	**83.08**	*4.76*	59.21	*37.51*	9.07	*<1.0*	**20.75**	*2.79*
35	**59.19**	*2.90*	45.79	*30.81*	11.13	*1.43*	**26.55**	*4.07*
136	7.53	*0.72*	<4.4	-	1.10	*<1.0*	3.14	*2.60*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-731. Major cations in the surface water after inundation of the Poltalloch Station soil material (Site 14): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	113	*8*	10088	*24*	4.7	*0.3*	365.2	*1.5*	20.3	*1.6*	438.1	*5.1*
4	128	*8*	10017	*545*	4.6	*0.4*	371.9	*10.7*	25.5	*0.4*	480.3	*27.4*
7	138	*3*	9617	*21*	5.4	*0.6*	359.9	*0.3*	28.0	*0.5*	475.2	*11.5*
11	147	*<1*	9933	*344*	5.7	*0.3*	348.0	*10.9*	27.3	*0.8*	474.2	*2.2*
18	113	*3*	8479	*442*	5.4	*<0.1*	331.8	*7.5*	26.0	*1.5*	423.6	*22.9*
25	129	*4*	9609	*225*	7.7	*0.1*	364.1	*20.2*	28.3	*1.1*	468.8	*18.7*
35	154	*1*	8767	*99*	9.9	*0.7*	354.1	*0.2*	26.0	*1.5*	443.0	*8.4*
136	276	*4*	10450	*121*	33.4	*1.5*	392.7	*12.3*	40.5	*0.3*	472.1	*8.5*

Table 9-732. Major cations in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1126	*197*	7453	*22*	11.1	*0.9*	229.6	*16.9*	238.1	*99.2*	518.0	*26.3*
4	579	*277*	9136	*434*	8.8	*2.1*	329.7	*12.3*	132.6	*86.4*	461.3	*60.5*
7	476	*348*	9196	*83*	11.1	*4.7*	336.2	*7.4*	99.4	*85.2*	463.7	*10.6*
11	388	*360*	9231	*244*	17.2	*18.2*	327.7	*10.3*	64.5	*60.6*	438.4	*15.3*
18	354	*195*	7602	*871*	26.5	*29.0*	300.8	*58.5*	65.7	*21.6*	404.3	*11.8*
25	323	*254*	8535	*810*	34.5	*42.6*	347.3	*5.0*	54.2	*32.4*	457.5	*64.7*
35	384	*226*	7824	*350*	44.5	*45.7*	337.9	*5.0*	54.6	*24.4*	411.5	*28.7*
136	403	*151*	9440	*167*	53.9	*23.3*	384.6	*10.5*	55.0	*18.3*	443.6	*4.8*

Table 9-733. Major cations in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	2190	*14*	2912	*652*	16.0	*0.9*	43.6	*52.6*	350.0	*9.7*	382.0	*18.3*
4	2451	*134*	4999	*231*	15.5	*0.6*	131.7	*28.9*	348.8	*59.4*	425.3	*34.4*
7	2415	*4*	5632	*75*	17.8	*1.3*	156.6	*21.9*	359.2	*11.8*	436.6	*11.9*
11	2493	*465*	6138	*632*	23.8	*4.9*	180.7	*28.7*	357.7	*108.0*	424.3	*25.1*
18	1622	*31*	5800	*885*	26.9	*4.1*	192.7	*22.5*	287.1	*39.8*	392.2	*31.7*
25	1617	*13*	6877	*794*	40.7	*12.2*	243.8	*12.7*	283.0	*27.3*	428.3	*35.2*
35	1672	*105*	6474	*565*	55.3	*14.8*	259.1	*5.1*	246.8	*31.8*	407.9	*5.8*
136	1088	*64*	8260	*381*	115.4	*19.5*	361.3	*2.9*	159.4	*8.6*	412.6	*9.2*

Table 9-734. Major cations and anions in the surface water after inundation of the Poltalloch Station soil material (Site 14): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	17.0	*0.6*	1310.2	*63.0*	140	*18*	19551	*275*	25	*8*	2813	*154*
4	17.9	*0.7*	1299.8	*23.3*	197	*10*	18833	*288*	53	*3*	2958	*84*
7	19.1	*0.1*	1308.5	*31.6*	187	*3*	19568	*262*	35	*7*	2784	*9*
11	19.7	*0.4*	1400.1	*53.5*	183	*<1*	19605	*803*	42	*6*	2788	*162*
18	13.8	*0.6*	1057.2	*47.0*	167	*2*	17033	*546*	50	*4*	2564	*11*
25	14.8	*0.5*	1133.0	*71.6*	204	*<1*	18561	*189*	63	*5*	2900	*194*
35	17.9	*0.7*	1081.5	*5.5*	241	*14*	19171	*144*	116	*10*	2966	*72*
136	33.6	*0.6*	1310.1	*13.3*	405	*7*	20973	*2*	309	*62*	3219	*33*

Table 9-735. Major cations and anions in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 14): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	170.4	*50.6*	956.0	*40.5*	1707	*515*	14497	*270*	1400	*517*	2951	*61*
4	79.0	*34.6*	1197.8	*53.1*	912	*577*	18359	*67*	819	*445*	2870	*198*
7	64.4	*46.4*	1258.6	*10.9*	776	*707*	18730	*110*	621	*603*	2790	*87*
11	46.3	*39.4*	1265.8	*7.9*	581	*645*	17886	*457*	514	*749*	2712	*71*
18	39.7	*14.6*	909.8	*90.7*	626	*493*	15055	*1867*	720	*642*	2696	*52*
25	32.1	*18.8*	1049.1	*119.5*	600	*573*	16328	*398*	619	*752*	3085	*347*
35	43.8	*18.5*	957.6	*46.0*	645	*484*	17069	*521*	847	*776*	3125	*422*
136	54.7	*23.6*	1183.6	*24.6*	571	*189*	18696	*434*	830	*452*	3389	*230*

Table 9-736. Major cations and anions in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 14): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	383.0	*3.7*	400.5	*91.3*	3306	*42*	4844	*1479*	2961	*153*	3184	*567*
4	398.9	*55.6*	707.6	*24.0*	3510	*149*	9491	*401*	3669	*275*	3032	*243*
7	395.4	*8.2*	785.7	*49.4*	3378	*360*	11024	*341*	3263	*37*	2963	*291*
11	439.9	*118.0*	875.5	*131.5*	3078	*350*	11975	*1364*	3252	*682*	3028	*266*
18	248.5	*19.3*	701.0	*148.3*	2597	*156*	11182	*1533*	2884	*197*	2894	*210*
25	253.7	*9.6*	811.9	*152.0*	2498	*207*	13227	*1465*	2997	*179*	3298	*281*
35	268.4	*19.3*	807.3	*55.8*	2537	*152*	14070	*1628*	3458	*279*	3606	*516*
136	203.3	*11.2*	974.2	*53.9*	1347	*50*	16513	*804*	3774	*71*	3900	*575*

Table 9-737. Selected surface water properties after inundation of the Poltalloch Station soil material (Site 15): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.93	*0.58*	7.07	*0.90*	458	*2*	479	*45*	2.4	*<0.1*	3.7	*<0.1*
4	6.74	*0.37*	6.94	*0.69*	350	*184*	409	*149*	2.0	*<0.1*	3.8	*0.1*
7	6.81	*0.59*	6.65	*0.72*	281	*21*	383	*198*	2.7	*0.2*	4.3	*0.3*
11	6.78	*0.92*	6.55	*1.09*	266	*27*	242	*23*	2.1	*<0.1*	4.2	*0.2*
18	6.99	*0.67*	7.16	*1.30*	186	*74*	169	*22*	1.4	*<0.1*	3.6	*0.1*
25	6.82	*1.04*	7.93	*0.18*	224	*18*	197	*17*	1.9	*0.3*	3.4	*0.2*
35	6.66	*1.16*	7.79	*0.14*	154	*45*	241	*19*	2.4	*<0.1*	3.7	*<0.1*
136	7.59	*0.75*	7.23	*0.95*	253	*13*	173	*7*	3.4	*<0.1*	4.3	*0.3*

Table 9-738. Selected pore-water properties (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	7.56	*2.24*	7.32	*0.76*	471	*12*	469	*24*	3.7	*1.5*	3.7	*0.1*
4	6.65	*0.33*	7.15	*0.60*	351	*116*	291	*101*	4.1	*0.9*	3.9	*0.1*
7	6.87	*0.33*	7.00	*0.59*	270	*66*	242	*102*	4.5	*2.2*	4.5	*0.2*
11	6.95	*0.62*	6.92	*0.90*	250	*60*	214	*138*	4.1	*2.0*	4.6	*0.4*
18	7.02	*0.51*	n.a.	-	233	*7*	n.a.	-	2.8	*0.9*	n.a.	-
25	6.88	*0.70*	7.58	*0.31*	213	*74*	215	*53*	4.1	*0.4*	4.0	*0.3*
35	6.69	*0.62*	7.13	*0.30*	156	*16*	210	*60*	4.6	*0.6*	4.5	*0.1*
136	7.30	*0.09*	7.05	*0.27*	254	*4*	131	*19*	5.6	*0.5*	4.6	*0.5*

Table 9-739. Selected pore-water properties (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): pH, Eh, and alkalinity.

	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	6.82	*0.26*	7.53	*0.51*	478	*11*	467	*26*	6.6	*0.2*	5.3	*1.6*
4	6.48	*0.10*	6.88	*0.35*	166	*20*	183	*13*	6.7	*0.3*	4.4	*0.4*
7	6.71	*0.29*	6.86	*0.49*	158	*2*	165	*9*	7.1	*0.5*	4.9	*0.2*
11	6.89	*0.27*	6.87	*0.41*	125	*6*	140	*6*	6.9	*0.9*	5.3	*0.5*
18	6.84	*0.45*	n.a.	-	174	*13*	n.a.	-	4.7	*0.5*	n.a.	-
25	6.93	*0.54*	7.24	*0.14*	189	*25*	192	*89*	8.5	*1.1*	4.7	*0.2*
35	6.39	*0.23*	7.24	*0.02*	139	*4*	206	*50*	9.8	*1.3*	6.2	*0.8*
136	7.41	*0.07*	6.96	*0.14*	235	*64*	132	*3*	10.8	*4.4*	5.4	*0.3*

Table 9-740. Selected surface water properties after inundation of the Poltalloch Station soil material (Site 15): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.93	*1.35*	<0.2	-	<0.2	-	<0.2	-	7.9	-	3.9	-
4	<0.2	-	1.50	*<0.2*	0.35	*0.70*	<0.2	-				
7	<0.2	-	1.83	*0.95*	<0.2	-	<0.2	-				
11	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.9	-	5.5	-
18	0.54	*<0.2*	0.57	*<0.2*	<0.2	-	<0.2	-				
25	<0.2	-	<0.2	-	<0.2	-	<0.2	-				
35	<0.2	-	<0.2	-	<0.2	-	<0.2	-	7.1	-	3.4	-
136	<0.2	-	<0.2	-	<0.2	-	<0.2	-	6.8	*0.8*	5.0	*1.6*

Table 9-741. Selected pore-water properties (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	0.38	*<0.2*	<0.2	-	<0.2	-	<0.2	-	20.0	-	15.0	-
4	0.65	*1.30*	1.88	*0.65*	0.60	*0.20*	<0.2	-				
7	0.35	*0.20*	3.90	*5.30*	0.50	*1.00*	<0.2	-				
11	0.30	*0.50*	3.18	*5.55*	<0.2	-	1.22	*2.45*	14.0	-	8.9	-
18	0.96	*0.34*	n.a.	-	0.56	*1.02*	n.a.	-				
25	1.10	*1.62*	<0.2	-	0.78	*0.62*	<0.2	-				
35	3.18	*4.22*	2.87	*2.60*	0.34	*0.60*	0.33	*0.24*	11.0	-	5.8	-
136	0.67	*0.56*	3.32	*2.69*	<0.2	-	1.08	*0.26*	10.5	*1.0*	4.4	*1.2*

Table 9-742. Selected pore-water properties (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Fe(II), Fe(III), and dissolved organic C.

	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	3.33	*2.85*	5.10	*10.20*	<0.2	-	<0.2	-	25.0	-	27.0	-
4	8.80	*1.60*	11.20	*10.40*	8.40	*4.00*	1.83	*1.55*				
7	5.75	*4.70*	10.33	*13.15*	5.90	*1.20*	0.43	*0.85*				
11	8.28	*5.85*	11.40	*8.40*	0.63	*1.27*	3.22	*4.12*	22.0	-	11.0	-
18	5.35	*5.75*	n.a.	-	5.97	*2.28*	n.a.	-				
25	3.65	*2.06*	1.72	*2.20*	1.92	*0.51*	<0.2	-				
35	13.02	*3.45*	6.09	*0.74*	1.19	*0.54*	1.69	*2.09*	24.0	-	7.1	-
136	<0.2	-	7.00	*0.63*	<0.2	-	1.42	*0.45*	22.0	*0.0*	6.1	*0.4*

Table 9-743. Selected nutrients in the surface water after inundation of the Poltalloch Station soil material (Site 15): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.095	*0.011*	0.068	*0.064*	0.026	*0.011*	0.032	*<0.005*
4	0.110	*0.040*	0.188	*0.036*	0.005	*0.010*	0.007	*0.006*
7	0.175	*0.030*	0.305	*0.190*	0.015	*0.010*	0.100	*0.120*
11	0.255	*0.010*	0.420	*0.280*	0.005	*0.010*	0.025	*0.010*
18	0.450	*0.300*	0.725	*0.310*	0.020	*<0.005*	0.150	*0.040*
25	0.390	*0.060*	0.235	*0.130*	<0.005	-	0.030	*0.040*
35	0.440	*0.040*	0.420	*0.080*	0.005	*0.010*	0.010	*0.020*
136	0.470	*0.100*	1.760	*0.260*	<0.005	-	<0.005	-

Table 9-744. Selected nutrients in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.585	*0.750*	1.025	*1.330*	0.040	*<0.005*	0.030	*0.020*
4	0.025	*0.050*	0.129	*0.157*	0.015	*0.010*	0.007	*0.007*
7	0.060	*<0.005*	0.160	*0.080*	0.020	*0.020*	0.030	*0.020*
11	0.145	*0.030*	0.260	*0.040*	0.005	*0.010*	0.030	*0.020*
18	0.085	*0.030*	n.a.	-	0.015	*0.010*	n.a.	-
25	0.125	*0.050*	0.135	*0.190*	0.005	*0.010*	0.010	*0.020*
35	0.145	*0.050*	0.175	*0.130*	0.020	*0.020*	0.030	*0.020*
136	<0.005	-	0.365	*0.190*	0.005	*0.010*	0.020	*0.020*

Table 9-745. Selected nutrients in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): NO_3^- and NO_2^-. (The values in bold red text exceed the relevant water quality guideline).

	NO_3^- (ppm N)				NO_2^- (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**17**		**n.a.**		**n.a.**		**n.a.**	
0.08	0.285	*0.230*	0.535	*0.790*	0.190	*0.060*	0.080	*0.020*
4	<0.005	-	0.055	*0.110*	0.130	*<0.005*	0.040	*0.080*
7	0.045	*0.010*	0.025	*0.010*	0.105	*0.070*	0.055	*0.050*
11	0.080	*0.020*	0.140	*0.180*	0.030	*0.020*	0.040	*0.020*
18	0.025	*0.030*	n.a.	-	0.090	*0.040*	n.a.	-
25	0.080	*0.020*	0.050	*0.040*	0.025	*0.010*	0.035	*0.030*
35	0.115	*0.130*	0.205	*0.230*	0.045	*0.030*	0.055	*0.010*
136	0.035	*0.070*	0.120	-	0.005	*0.010*	0.030	*0.020*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-746. Selected nutrients in the surface water after inundation of the Poltalloch Station soil material (Site 15): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.025	*0.010*	0.025	*0.010*	0.275	*0.090*	0.190	*0.340*
4	0.070	*0.060*	0.090	*0.040*	0.115	*0.090*	0.540	*0.040*
7	0.040	*0.020*	0.050	*0.040*	0.475	*0.010*	0.600	*0.480*
11	0.085	*0.010*	0.065	*0.050*	0.115	*0.010*	0.790	*0.740*
18	0.130	*0.080*	0.040	*0.020*	0.300	*0.360*	0.330	*0.100*
25	0.095	*0.010*	0.040	*<0.005*	0.080	*<0.005*	0.405	*0.010*
35	0.090	*<0.005*	0.040	*0.020*	0.065	*0.010*	0.140	*0.020*
136	0.080	*<0.005*	0.050	*0.020*	0.075	*0.010*	0.100	*<0.005*

Table 9-747. Selected nutrients in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.055	*0.050*	0.075	*0.090*	0.470	*0.520*	0.010	*0.020*
4	0.225	*0.050*	0.105	*0.050*	0.910	*0.920*	0.605	*0.310*
7	0.220	*0.020*	0.055	*0.050*	1.355	*1.050*	1.060	*0.440*
11	0.195	*0.110*	0.075	*0.050*	1.280	*1.280*	1.680	*1.000*
18	0.175	*0.250*	n.a.	-	1.585	*0.890*	n.a.	-
25	0.090	*0.140*	0.060	*0.020*	1.765	*0.470*	1.360	*0.740*
35	0.035	*0.030*	0.020	*<0.005*	2.055	*0.330*	1.625	*0.470*
136	0.020	*<0.005*	0.050	*0.020*	2.200	*0.760*	1.290	*0.160*

Table 9-748. Selected nutrients in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): PO_4^{3-} and NH_3. (The values in bold red text exceed the relevant water quality guideline).

	PO_4^{3-} (ppm P)				NH_3 (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**n.a.**		**n.a.**		**2.300**		**1.700**	
0.08	0.025	*0.010*	0.040	*0.020*	**2.735**	*0.850*	**2.125**	*3.230*
4	0.145	*0.050*	0.100	*0.200*	**3.675**	*0.810*	**1.830**	*0.220*
7	0.075	*0.090*	0.055	*0.030*	**3.430**	*1.800*	**2.640**	*0.560*
11	0.055	*0.030*	0.085	*0.050*	**3.290**	*1.740*	**3.675**	*1.370*
18	0.075	*0.070*	n.a.	-	**3.870**	*1.920*	n.a.	-
25	0.030	*0.020*	0.040	*0.020*	**4.270**	*1.880*	**3.335**	*1.070*
35	0.035	*0.010*	0.035	*0.010*	**5.420**	*0.780*	**4.210**	*0.220*
136	0.050	*0.060*	0.055	*0.010*	**6.850**	*2.700*	**3.500**	*0.800*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-749. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 15): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.03*	0.06	*0.11*	0.11	*0.14*	0.29	*0.28*	0.01	*0.02*	<0.01	-
4	0.04	*0.05*	0.04	*0.06*	0.22	*0.18*	0.18	*0.19*	<0.01	-	0.37	*0.22*
7	0.04	*0.04*	0.05	*0.06*	0.20	*0.28*	0.22	*0.15*	<0.01	-	0.44	*0.55*
11	0.04	*0.05*	0.02	*0.03*	0.20	*0.32*	0.25	*0.27*	<0.01	-	0.37	*0.61*
18	0.02	*0.03*	0.02	*0.03*	0.37	*0.60*	0.45	*0.59*	<0.01	-	0.32	*0.24*
25	0.02	*0.02*	0.02	*0.03*	0.40	*0.66*	0.40	*0.72*	<0.01	-	<0.01	-
35	0.03	*0.03*	0.01	*<0.01*	0.31	*0.60*	0.17	*0.23*	<0.01	-	<0.01	-
136	0.01	*<0.01*	0.01	*0.01*	0.26	*0.40*	0.34	*0.41*	<0.01	-	<0.01	-

Table 9-750. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	0.02	*0.04*	<0.01	-	0.09	*0.11*	0.09	*0.04*	0.39	*0.77*	<0.01	-
4	0.02	*<0.01*	<0.01	-	0.81	*1.40*	0.59	*1.12*	1.30	*1.36*	1.11	*1.23*
7	0.04	*0.04*	0.02	*<0.01*	0.53	*0.90*	1.47	*2.64*	1.27	*1.51*	2.13	*2.81*
11	0.04	*0.04*	<0.01	-	0.70	*1.21*	3.91	*7.61*	1.23	*1.26*	1.98	*2.60*
18	0.01	*0.01*	n.a.	-	1.18	*1.67*	n.a.	-	1.16	*0.49*	n.a.	-
25	<0.01	-	<0.01	-	1.99	*2.64*	0.20	*0.24*	1.49	*0.55*	1.66	*2.20*
35	0.01	*<0.01*	<0.01	-	3.45	*4.81*	2.80	*2.38*	1.54	*0.10*	1.31	*1.22*
136	<0.01	-	<0.01	-	0.76	*0.53*	3.84	*2.54*	0.72	*0.41*	0.15	*0.07*

Table 9-751. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Al, Fe, and Mn. (The values in bold red text exceed the relevant water quality guideline).

	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**0.150 [1]**		**n.a.**		**n.a.**		**n.a.**		**3.60**		**n.a.**	
0.08	<0.01	-	0.02	*0.03*	3.60	*3.30*	4.34	*8.56*	0.96	*0.29*	0.70	*1.34*
4	0.01	*<0.01*	<0.01	-	14.24	*0.38*	9.65	*11.27*	2.20	*0.44*	1.56	*0.86*
7	0.02	*<0.01*	0.03	*<0.01*	14.20	*6.69*	11.87	*13.48*	1.66	*0.58*	1.99	*0.86*
11	<0.01	-	0.03	*0.02*	11.60	*6.34*	13.71	*10.36*	1.53	*0.84*	2.21	*<0.01*
18	<0.01	-	n.a.	-	11.60	*9.42*	n.a.	-	1.78	*0.91*	n.a.	-
25	<0.01	-	<0.01	-	5.58	*2.68*	4.11	*5.52*	1.66	*0.70*	1.85	*3.26*
35	<0.01	-	<0.01	-	10.00	*3.23*	9.29	*7.96*	1.69	*0.64*	2.57	*4.52*
136	<0.01	-	<0.01	-	0.11	*0.02*	7.25	*0.56*	1.08	*0.30*	0.28	*0.02*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). [1] WQG for aluminium in freshwater where pH > 6.5.

Table 9-752. Selected metalloids and metals in the surface water after inundation of the Poltalloch Station soil material (Site 15): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	1.35	*0.16*	<15.0	-	1.58	*0.71*	4.76	*4.14*	1.71	*0.35*	<5.0	-
4	<1.0	-	<15.0	-	2.74	*0.67*	3.69	*3.43*	1.27	*0.38*	5.28	*0.40*
7	2.08	*0.18*	<15.0	-	2.64	*0.73*	5.29	*0.28*	2.51	*0.44*	8.29	*2.48*
11	1.43	*0.33*	19.49	*0.98*	2.43	*0.97*	3.77	*0.32*	2.00	*0.49*	8.61	*2.79*
18	2.43	*1.30*	22.44	*2.39*	2.22	*1.11*	3.17	*0.26*	1.48	*0.29*	8.19	*3.74*
25	3.14	*1.92*	38.79	*15.32*	2.51	*1.36*	2.41	*1.03*	2.00	*0.28*	<5.0	-
35	1.93	*0.73*	<15.0	-	3.32	*1.32*	3.78	*0.46*	1.79	*0.62*	<5.0	-
136	2.97	*0.70*	38.97	*9.60*	1.23	*0.09*	**10.54**	*0.18*	1.97	*0.20*	<5.0	-

Table 9-753. Selected metalloids and metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	6.87	*1.40*	<15.0	-	3.98	*3.18*	5.80	*3.55*	13.46	*5.87*	9.45	*12.42*
4	12.16	*12.01*	<15.0	-	1.54	*1.66*	1.69	*2.93*	9.27	*4.25*	7.60	*4.81*
7	16.47	*16.35*	16.73	*2.01*	1.72	*0.23*	4.70	*1.04*	8.58	*5.57*	12.02	*5.62*
11	18.00	*17.70*	22.73	*9.07*	1.69	*1.02*	3.01	*2.10*	7.20	*2.37*	11.52	*6.44*
18	21.63	*6.86*	n.a.	-	2.19	*0.13*	n.a.	-	4.70	*0.81*	n.a.	-
25	21.51	*4.57*	43.45	*2.16*	1.10	*0.44*	2.16	*1.33*	6.49	*4.12*	10.06	*1.24*
35	19.28	*4.77*	<15.0	-	2.26	*0.38*	3.03	*0.73*	3.74	*0.11*	<5.0	-
136	16.37	*1.27*	52.98	*11.52*	<1.0	-	**10.79**	*4.14*	3.10	*0.93*	<5.0	-

Table 9-754. Selected metalloids and metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): As, Cu, and Ni. (The values in bold red text exceed the relevant water quality guideline).

	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**360**		**n.a.**		**13**		**8**		**88.4**		**560**	
0.08	8.58	*1.49*	<15.0	-	1.37	*1.42*	4.24	*3.22*	10.82	*6.79*	14.51	*7.93*
4	6.48	*0.19*	17.34	*2.32*	2.03	0.58	<1.0	**-**	10.17	*8.05*	7.50	*2.96*
7	9.00	*1.68*	20.96	*3.11*	<1.0	-	3.77	*0.09*	8.39	*3.58*	8.83	*0.50*
11	7.76	*0.26*	22.38	*1.18*	<1.0	**-**	3.81	*1.58*	7.90	*0.49*	8.07	*4.38*
18	11.03	*2.25*	n.a.	-	<1.0	-	n.a.	-	6.89	*0.20*	n.a.	-
25	8.63	*0.15*	39.86	*9.43*	1.23	*1.24*	2.47	*2.05*	6.82	*1.56*	9.72	*7.73*
35	9.50	*4.75*	<15.0	-	2.52	*0.94*	1.47	*2.44*	5.97	*2.29*	<5.0	-
136	32.23	*25.54*	58.82	*6.28*	<1.0	-	**13.09**	*5.74*	3.43	*0.69*	<5.0	-

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes As in solution is as ASIII).

Table 9-755. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 15): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	20.78	*1.60*	19.89	*2.08*	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	48.24	*4.24*	**65.82**	-	<0.1	-	0.20	*0.12*	<1.0	-	2.99	*0.31*
7	24.97	*0.60*	**45.66**	*24.58*	<0.1	-	0.11	*<0.1*	<1.0	-	3.99	*3.71*
11	n.a.	-	27.45	*11.61*	<0.1	-	0.14	*<0.1*	<1.0	-	3.81	*4.86*
18	n.a.	-	n.a.	-	<0.1	-	0.11	*<0.1*	<1.0	-	3.79	*1.63*
25	10.09	*0.35*	8.56	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	56.35	*2.60*	25.29	-	<0.1	-	0.14	*<0.1*	<1.0	-	<1.0	-
136	3.43	*1.44*	<5.0	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-

Table 9-756. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	56.22	*29.03*	18.39	*0.04*	<0.1	-	<0.1	-	2.88	*4.38*	<1.0	-
4	127.75	*26.10*	**71.90**	*37.66*	<0.1	-	0.19	*<0.1*	6.67	*8.01*	12.42	*18.06*
7	27.42	*13.87*	**46.35**	*8.51*	<0.1	-	0.17	*<0.1*	6.95	*9.67*	20.14	*28.27*
11	57.71	*72.48*	**52.17**	-	<0.1	-	0.14	*<0.1*	5.37	*6.65*	23.45	*33.05*
18	n.a.	-	n.a.	-	<0.1	-	n.a.	-	3.86	*2.49*	n.a.	-
25	61.43	*81.42*	20.17	*0.72*	<0.1	-	<0.1	-	3.96	*3.19*	9.14	*2.07*
35	26.56	*18.56*	29.90	*24.02*	<0.1	-	0.16	*<0.1*	3.30	*2.63*	9.61	*1.14*
136	9.90	*0.71*	<5.0	-	<0.1	-	0.14	*<0.1*	1.51	*0.51*	2.81	*1.68*

Table 9-757. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Zn, Cd, and Co. (The values in bold red text exceed the relevant water quality guideline).

	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG	**161.2**		**43**		**4.6**		**36**		**n.a.**		**150**	
0.08	62.43	*7.49*	**45.34**	*11.40*	<0.1	-	<0.1	-	6.07	*7.30*	16.21	*30.91*
4	40.43	-	**121.82**	*55.39*	<0.1	-	0.17	*<0.1*	10.26	*10.35*	17.06	*4.21*
7	33.68	*4.91*	**76.74**	*26.32*	<0.1	-	0.18	*<0.1*	6.93	*4.43*	17.80	*4.99*
11	55.13	*20.83*	**152.85**	*17.46*	<0.1	-	0.16	*<0.1*	5.17	*2.23*	18.93	*5.50*
18	n.a.	-	n.a.	-	<0.1	-	n.a.	-	4.93	*1.54*	n.a.	-
25	14.31	*5.96*	20.57	*0.51*	<0.1	-	<0.1	-	3.75	*1.38*	10.86	*8.22*
35	22.15	*11.03*	**45.44**	*25.64*	<0.1	-	0.12	*<0.1*	3.00	*1.43*	8.39	*2.84*
136	5.58	*1.66*	<5.0	-	<0.1	-	<0.1	-	<1.0	-	3.15	*0.63*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-758. Selected metals in the surface water after inundation of the Poltalloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.01	*0.58*	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.19	*0.03*	<4.4	-	<1.0	-	<1.0	-
11	1.12	*0.83*	<4.4	-	<1.0	-	<1.0	-
18	1.11	*0.55*	<4.4	-	<1.0	-	<1.0	-
25	2.01	*1.99*	<4.4	-	<1.0	-	<1.0	-
35	1.89	*0.04*	<4.4	-	<1.0	-	<1.0	-
136	<1.0	-	<4.4	-	<1.0	-	<1.0	-

Table 9-759. Selected metals in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.67	*0.46*	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.74	*0.28*	<4.4	-	<1.0	-	<1.0	-
11	2.17	*1.88*	<4.4	-	<1.0	-	<1.0	-
18	1.53	*0.00*	n.a.	-	<1.0	-	n.a.	-
25	2.52	*0.21*	<4.4	-	<1.0	-	<1.0	-
35	2.65	*0.65*	<4.4	-	<1.0	-	<1.0	-
136	1.09	*0.00*	<4.4	-	<1.0	-	<1.0	-

Table 9-760. Selected metals in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**40**		**85**		**110.9**		**12**	
0.08	1.44	*0.26*	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.87	*0.11*	<4.4	-	1.12	*1.74*	<1.0	-
11	2.99	*0.01*	<4.4	-	<1.0	-	<1.0	-
18	3.56	*2.10*	n.a.	-	<1.0	-	n.a.	-
25	4.88	*0.30*	<4.4	-	<1.0	-	<1.0	-
35	3.48	*0.64*	<4.4	-	<1.0	-	<1.0	-
136	2.48	*0.53*	<4.4	-	<1.0	-	2.21	*2.81*

* The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000). (Assumes Cr in solution is as CrVI).

Table 9-761. Major cations in the surface water after inundation of the Poltalloch Station soil material (Site 15): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	108	*1*	10099	*120*	4.9	*0.4*	351.7	*10.1*	20.4	*0.4*	443.7	*18.1*
4	123	*3*	8821	*68*	5.2	*0.1*	337.1	*1.8*	22.9	*0.7*	447.1	*5.9*
7	127	*7*	8890	*131*	5.7	*0.6*	329.3	*2.2*	24.7	*2.9*	480.8	*5.2*
11	129	*21*	8977	*171*	5.7	*0.8*	318.8	*3.7*	24.1	*1.1*	452.7	*10.5*
18	95	*6*	8370	*1179*	4.4	*0.7*	318.2	*25.0*	23.7	*1.9*	434.9	*49.5*
25	105	*16*	9752	*635*	5.3	*1.1*	373.0	*35.6*	26.1	*2.9*	464.2	*30.3*
35	130	*27*	8816	*604*	5.6	*1.5*	364.1	*14.5*	26.7	*5.1*	422.6	*21.5*
136	220	*22*	11781	*698*	10.3	*1.1*	424.1	*18.5*	40.7	*1.2*	478.2	*20.1*

Table 9-762. Major cations in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	719	*96*	*7759*	*3820*	35.6	*0.3*	261.9	*142.5*	174.0	*29.0*	479.1	*47.6*
4	364	*123*	8950	*166*	17.0	*1.5*	338.8	*22.4*	79.0	*23.6*	460.7	*4.1*
7	239	*235*	8770	*86*	11.9	*9.8*	330.0	*3.5*	56.0	*39.7*	466.6	*6.9*
11	260	*274*	9195	*238*	11.8	*11.2*	319.3	*17.5*	55.5	*37.5*	461.8	*<0.1*
18	175	*151*	n.a.	-	9.3	*7.4*	n.a.	-	51.1	*24.0*	n.a.	-
25	177	*114*	10005	*801*	10.3	*6.7*	375.3	*4.6*	54.7	*25.8*	471.2	*67.1*
35	232	*96*	8935	*230*	10.5	*4.1*	363.1	*15.7*	52.0	*8.5*	441.8	*21.0*
136	276	*23*	11469	*169*	13.1	*0.3*	419.3	*2.4*	52.0	*3.8*	470.1	*2.5*

Table 9-763. Major cations in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Na^+, K^+, and Ca^{2+}.

	Na^+ (ppm)				K^+ (ppm)				Ca^{2+} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
0.08	1612	*474*	3741	*2556*	72.4	*21.8*	125.0	*99.5*	276.5	*136.7*	372.9	*16.8*
4	1795	*435*	8451	*354*	65.9	*13.5*	315.3	*0.3*	279.8	*110.6*	459.2	*0.4*
7	1264	*414*	8702	*332*	52.8	*7.9*	316.3	*1.8*	198.1	*31.1*	472.7	*19.3*
11	1231	*615*	9315	*783*	50.6	*15.9*	314.7	*31.4*	180.9	*69.3*	474.1	*43.3*
18	882	*410*	n.a.	-	40.5	*10.1*	n.a.	-	175.5	*81.0*	n.a.	-
25	860	*245*	10546	*1593*	38.6	*8.2*	383.9	*41.2*	161.4	*45.6*	517.9	*112.9*
35	887	*144*	8656	*214*	37.6	*2.1*	334.7	*6.1*	160.1	*21.1*	407.7	*22.9*
136	518	*13*	11146	*90*	23.1	*1.7*	414.0	*1.6*	84.6	*4.2*	469.5	*1.3*

Table 9-764. Major cations and anions in the surface water after inundation of the Poltalloch Station soil material (Site 15): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	16.5	1.2	1255.7	34.2	160	19	19166	545	33	6	2856	68
4	17.4	0.3	1146.7	22.5	213	25	18352	384	38	<1	2645	101
7	18.4	2.9	1202.5	17.6	199	50	18062	173	24	3	2502	19
11	18.9	2.5	1251.9	40.2	177	32	18242	638	19	10	2535	70
18	12.9	<0.1	1018.4	136.3	165	55	16344	1036	17	6	2427	208
25	13.7	1.1	1178.2	77.0	186	44	18919	1132	15	30	2795	170
35	17.2	2.3	1093.2	20.4	214	68	20167	1114	56	3	2820	193
136	30.0	1.7	1422.5	66.0	300	31	23097	1208	72	5	3120	97

Table 9-765. Major cations and anions in the pore-water (3-5 cm) after inundation of the Poltalloch Station soil material (Site 15): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	97.5	39.6	999.4	460.8	1089	163	14740	7726	427	54	2481	558
4	45.5	22.8	1175.1	70.8	530	194	18733	901	168	74	2690	26
7	33.5	32.0	1205.1	32.4	343	360	18471	439	49	66	2612	126
11	36.0	32.7	1276.4	44.5	325	341	18416	447	33	43	2598	69
18	22.8	15.4	n.a.	-	285	269	n.a.	-	22	11	n.a.	-
25	23.4	14.0	1218.3	151.8	309	212	18655	666	18	37	2773	51
35	28.2	10.4	1115.2	20.9	371	146	20199	624	54	44	2827	57
136	34.4	11.2	1390.6	39.4	373	45	22503	512	42	5	3030	4

Table 9-766. Major cations and anions in the pore-water (10-12 cm) after inundation of the Poltalloch Station soil material (Site 15): Mg^{2+}, Cl^-, and SO_4^{2-}.

	Mg^{2+} (ppm)				Cl^- (ppm)				SO_4^{2-} (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	257.3	65.0	501.6	279.9	2595	624	6895	4987	988	476	1610	371
4	271.1	39.4	1108.9	5.0	2814	540	17407	680	1182	496	2569	33
7	192.2	92.3	1196.5	58.0	1886	671	18176	498	653	176	2574	55
11	188.6	127.8	1306.1	157.1	1655	875	18503	1161	573	352	2625	221
18	133.7	85.5	n.a.	-	1432	678	n.a.	-	488	285	n.a.	-
25	127.4	54.3	1246.8	274.5	1499	512	19184	1245	462	152	2929	486
35	147.0	52.2	1074.8	32.2	1566	320	19035	242	502	73	2593	116
136	92.7	1.6	1391.6	33.5	674	49	22323	407	111	123	3019	67

Appendix 5. Diffusion rates

Table 9-767. Summary of alkalinity apparent net diffusion rates after River Murray and seawater inundation (x 10^{-3} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	-4.3	23.5	**80.8**	**308.0**	51.8	-175.4	-66.1	-29.5	46.8	11.6	15.2	-1.1	6.3	0.8
2	6.8	19.6	**44.1**	**476.0**	43.8	-72.8	-59.6	-146.1	26.8	33.1	18.0	-3.3	4.6	1.2
3	-8.0	-27.6	**30.8**	**230.3**	20.9	-125.6	-49.5	-29.0	28.3	8.9	7.2	8.2	-0.1	1.5
4	-10.3	-20.3	**40.4**	**184.6**	15.9	-79.8	-42.9	-25.9	35.1	18.4	0.5	3.9	2.1	2.4
5	13.8	-60.3	5.2	**168.6**	3.8	-95.3	-42.2	-18.2	**30.2**	9.5	1.8	7.5	1.1	0.0
6	-12.9	-98.2	**34.2**	**97.7**	-1.5	-30.0	-39.9	-21.0	31.4	11.0	3.0	10.2	1.7	-1.9
7	-28.6	-89.4	**25.2**	**111.2**	-6.7	-70.7	-35.7	-40.5	19.3	-1.9	3.4	-1.3	-1.3	-1.6
8	-26.1	-109.5	**25.0**	**36.7**	-16.9	-54.9	-37.5	-45.3	18.5	7.0	0.2	7.8	-2.5	-3.2
9	-9.2	-48.9	**33.0**	**88.1**	-14.2	-24.6	-35.4	-26.5	29.2	21.3	4.2	-2.1	0.7	0.8
10	-20.3	-52.1	**34.6**	**42.8**	-21.9	-21.9	-38.2	-31.3	25.3	6.7	7.3	21.8	-0.8	-2.3
11	-25.0	-10.1	**68.2**	**66.0**	-29.6	-2.1	-36.6	-22.7	39.1	5.0	14.4	6.0	5.4	1.2
12	1.5	66.5	**120.5**	**124.7**	51.3	83.2	-50.6	-15.7	99.4	30.9	13.3	-11.9	2.9	-0.5
13	-46.1	-114.3	**26.3**	**11.0**	-41.0	-36.3	-34.8	-31.4	-0.7	-4.8	6.6	3.9	-2.2	-3.1
14	-44.7	-114.9	**88.1**	-6.4	-91.3	-51.3	-32.7	-40.3	-10.6	0.2	1.9	**0.2**	-1.2	-1.1
15	-32.4	7.9	**77.9**	**48.5**	-48.7	-4.9	-28.6	-24.5	20.8	-9.1	14.6	6.8	2.8	1.8

Table 9-768. Summary of NO_3^- apparent net diffusion rates after River Murray and seawater inundation (x 10^{-3} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	-0.03	0.22	0.68	0.64	0.56	1.42	**2.59**	0.99	0.55	**2.60**	-0.68	-0.57	-0.07	0.09
2	0.25	**2.43**	**0.71**	0.21	0.62	1.82	0.26	0.47	0.43	0.41	-0.07	0.24	0.00	0.17
3	0.03	-0.01	0.32	**0.25**	-0.03	0.00	0.02	0.05	**1.12**	-0.11	0.13	0.24	0.24	0.15
4	0.06	1.24	0.35	-1.42	0.11	0.03	0.77	0.08	**0.83**	0.31	-0.13	**1.24**	-0.01	0.04
5	0.33	**8.53**	**0.68**	0.32	0.19	0.38	0.47	-1.12	0.18	-0.55	-0.01	-0.11	0.03	0.12
6	0.14	0.27	0.75	0.32	**1.26**	-0.08	0.38	-0.03	0.34	0.17	-0.01	**1.28**	0.01	0.49
7	0.16	-0.11	0.14	0.21	**0.80**	0.24	0.44	-0.06	0.63	**0.38**	0.21	0.27	0.17	0.24
8	0.15	0.04	0.54	0.09	**1.42**	-0.05	0.70	0.05	0.46	**0.11**	0.08	-0.08	0.09	-0.01
9	0.30	**3.99**	**0.71**	0.25	0.40	1.26	0.34	-0.38	0.34	0.24	-0.15	0.18	0.08	0.29
10	0.09	2.19	0.43	0.07	**3.35**	0.35	1.82	0.15	0.47	7.61	-0.43	**13.48**	0.16	0.07
11	-28.13	**14.43**	0.23	1.89	**0.94**	8.22	0.46	-4.65	0.20	0.32	0.09	-0.84	-0.05	0.58
12	-0.33	-2.52	-0.07	-0.25	-0.03	0.27	0.02	-0.08	**0.99**	0.12	0.90	**2.74**	-0.16	-0.07
13	-0.01	-0.30	0.29	**0.26**	0.19	-0.08	0.35	0.06	0.46	-0.06	**0.63**	0.04	-0.03	0.00
14	0.01	-0.08	0.43	**0.50**	0.29	-0.03	0.90	-0.17	**1.21**	0.14	0.66	0.44	-0.24	-0.05
15	0.08	0.66	0.46	0.84	0.43	0.62	**0.60**	**0.93**	-0.18	-1.50	0.11	0.40	0.01	0.28

Table 9-769. Summary of NH_3 apparent net diffusion rates after River Murray and seawater inundation (x 10^{-3} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	1.64	2.13	**7.61**	3.46	-1.82	1.37	-3.26	**15.29**	-0.20	-9.35	-0.02	-6.76	0.06	-0.01
2	-0.22	-0.41	**2.21**	**1.07**	-2.09	0.91	1.03	-0.77	-1.03	0.61	-0.05	-0.61	0.05	-0.01
3	-0.74	0.19	**3.57**	0.43	-1.74	**1.10**	0.54	0.12	-0.93	1.07	-0.09	-0.45	0.05	-0.09
4	-0.79	0.25	**3.89**	0.43	-1.55	**2.87**	2.05	-0.67	-2.83	1.01	-0.02	-0.93	0.05	-0.06
5	-0.77	0.49	**2.89**	0.75	-1.85	**1.13**	1.29	-0.55	-1.38	0.66	-0.03	-0.80	0.05	-0.01
6	-0.71	**2.43**	**3.36**	0.79	-2.33	1.77	0.17	-0.38	-0.29	0.73	-0.04	-1.09	0.06	-0.09
7	-0.66	1.56	**3.43**	1.00	-2.33	**2.12**	1.76	-0.02	-1.94	1.42	-0.04	-0.28	0.05	0.04
8	-0.16	**5.74**	**3.46**	3.50	-2.95	3.51	0.11	0.23	-0.32	2.85	-0.01	-1.02	0.06	0.34
9	-0.82	0.41	**2.79**	0.46	-1.90	**0.99**	1.29	-0.26	-1.32	0.78	-0.01	-0.72	0.05	-0.03
10	1.97	**19.59**	**4.29**	2.68	-5.04	4.37	-0.05	-1.36	-0.95	-3.09	-0.02	-7.73	0.05	-0.02
11	-0.30	0.63	**3.39**	0.07	-2.46	0.21	0.02	-1.12	-0.28	**0.72**	-0.01	-0.70	0.00	0.00
12	3.39	5.20	**8.71**	6.64	3.59	**8.12**	7.03	2.56	-1.79	3.47	0.09	-1.76	-0.95	-0.96
13	-0.38	**2.63**	**3.36**	0.96	-1.42	1.85	0.23	0.06	-0.41	1.29	-0.40	-0.38	0.22	0.26
14	-0.08	**6.54**	**3.61**	2.21	-0.86	3.75	0.32	0.92	-0.12	3.11	0.71	0.19	0.87	0.53
15	-0.88	**1.91**	**2.57**	0.43	-1.93	1.02	0.57	-1.41	-0.67	0.23	-0.03	-0.57	0.00	-0.01

Table 9-770. Summary of Ni apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	0.57	0.06	**2.68**	**4.41**	-1.05	2.47	-0.51	-0.59	0.35	0.05	0.07	-2.67	0.11	1.07
2	-0.45	-0.84	0.21	**3.62**	-0.28	2.52	-0.60	-1.29	**0.81**	1.18	0.01	-1.97	0.04	0.63
3	1.44	-0.57	1.49	**6.22**	0.08	2.37	-0.03	1.57	**1.62**	0.27	0.86	-2.85	0.69	1.55
4	-0.05	-0.75	**1.14**	**2.12**	-0.31	1.73	-0.41	-1.34	0.82	1.46	-0.46	-1.59	0.10	0.73
5	-0.50	**30.08**	**1.70**	16.41	-0.46	-2.95	-0.44	-7.34	0.89	3.37	-0.58	-4.89	0.03	0.14
6	0.18	**87.91**	**0.88**	-13.64	-0.50	12.60	-0.28	-22.02	0.34	1.34	-0.07	-7.94	0.04	-0.06
7	-0.31	**17.67**	**1.21**	4.60	-1.01	4.21	-0.63	1.30	0.54	5.51	-0.15	2.49	0.02	1.39
8	0.92	**13.41**	**1.66**	9.47	-1.17	11.48	-0.10	-5.85	0.12	6.12	-0.24	-6.01	0.04	0.58
9	-0.01	**3.81**	**0.51**	2.03	-0.18	1.18	-0.11	-0.25	0.29	-0.24	-0.14	-2.19	0.02	0.63
10	0.20	**43.70**	-0.20	0.13	0.08	1.90	-0.25	-4.27	**0.24**	5.82	-0.20	-7.49	0.01	-0.21
11	-3.25	**6.25**	**0.51**	1.11	0.46	3.41	-0.51	-0.46	0.31	0.90	0.03	-2.45	0.05	0.61
12	-0.23	**2.55**	0.66	1.87	-0.38	-1.17	-0.29	0.85	**0.96**	1.41	-0.50	-2.75	0.05	0.61
13	1.16	**30.96**	**2.38**	12.39	-0.50	1.93	0.61	4.69	0.58	7.28	0.65	-1.77	1.02	1.10
14	0.00	**13.16**	**2.10**	11.12	0.04	2.58	0.28	0.90	0.78	4.63	0.22	-1.63	0.30	0.61
15	-0.57	**6.26**	**2.12**	5.11	-0.66	0.42	-0.38	-0.31	0.38	-3.30	-0.11	-1.88	0.01	0.63

Table 9-771. Summary of Cu apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	-0.48	0.01	**2.70**	**4.57**	-1.19	-2.39	0.30	0.90	-0.43	0.71	0.68	-0.40	-0.02	0.02
2	-0.97	0.27	**1.46**	**4.58**	-0.32	0.37	0.06	-0.08	0.08	0.24	0.23	-0.40	-0.04	-0.11
3	-0.54	**3.44**	1.05	0.60	-0.22	-1.90	0.36	0.97	**1.62**	0.03	-0.75	-0.86	-0.19	0.03
4	-0.84	-0.42	**2.40**	**4.45**	-0.65	-1.16	0.50	-0.71	-0.30	0.66	-0.30	-0.07	-0.04	-0.07
5	-0.51	1.52	**1.93**	**3.85**	-0.41	-1.69	0.33	-0.65	0.00	-0.02	0.46	0.27	-0.09	0.05
6	-0.57	3.19	**2.73**	**4.22**	-1.17	0.59	0.17	-1.99	1.28	-0.33	-0.67	-0.11	-0.04	0.09
7	-0.51	0.94	**2.35**	**5.91**	-0.59	-1.62	0.39	0.02	-0.21	0.65	-0.21	1.14	-0.05	0.49
8	1.07	1.66	**3.17**	**8.05**	-1.65	0.35	0.06	-2.23	0.19	0.30	-0.19	-0.95	-0.05	0.61
9	**1.50**	0.13	-1.34	**3.07**	-0.17	-0.64	1.00	-1.22	-0.60	-0.23	0.37	0.65	-0.08	0.17
10	0.07	0.03	**1.05**	**8.84**	-0.64	-3.41	0.31	-1.16	0.01	0.40	0.38	-0.25	-0.06	0.25
11	-3.19	0.17	0.69	**6.94**	-0.25	-1.96	**1.39**	-0.67	-0.99	-0.67	0.16	0.33	-0.05	-0.02
12	-2.75	-0.68	**1.15**	**1.74**	0.47	-2.30	-0.20	0.40	0.06	0.15	-0.18	0.25	-0.05	0.01
13	**1.71**	-0.31	-1.20	**5.74**	0.03	-1.86	0.04	-0.56	1.22	-0.20	-0.65	1.06	0.09	0.22
14	2.09	**17.83**	**49.78**	2.98	-4.44	-1.70	-4.75	2.04	3.01	3.17	20.55	2.71	10.41	-0.32
15	**1.39**	-1.29	-0.15	**2.52**	-0.25	-1.80	-0.14	-0.40	0.20	-0.51	0.38	0.65	-0.10	0.32

Table 9-772. Summary of As apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	0.54	-14.74	**1.63**	6.18	1.51	3.48	-0.17	3.53	-0.35	**10.19**	0.24	-15.88	0.02	1.43
2	0.45	-7.84	-0.95	-3.29	**1.03**	7.69	0.15	2.38	-0.20	**10.39**	0.28	-14.21	0.07	1.19
3	-0.39	-6.43	0.39	5.15	-0.02	-7.31	-0.17	10.08	-0.11	**12.24**	**0.59**	-14.88	0.19	1.30
4	0.40	-7.91	-0.45	-0.39	**0.66**	-2.27	-0.10	3.64	-0.06	**13.43**	0.52	-10.71	0.05	1.38
5	-0.42	-15.99	**0.44**	3.06	0.31	0.01	0.08	4.46	-0.33	**14.71**	0.29	-13.89	0.02	1.07
6	-0.33	1.89	-0.14	-14.88	**0.47**	2.81	-0.32	4.71	0.12	**11.62**	0.16	-13.04	0.01	1.39
7	0.45	6.18	-1.12	-20.37	**0.49**	3.99	-0.27	**7.51**	-0.32	5.17	0.42	-11.04	0.03	1.36
8	**0.81**	7.64	0.23	-9.36	0.63	-2.39	-0.71	6.46	-0.49	**8.34**	0.52	-11.68	0.00	1.37
9	-0.58	4.20	**0.68**	-7.48	0.56	-2.31	-0.23	8.91	-0.34	**9.60**	0.10	-13.83	0.04	1.74
10	-0.30	2.34	**0.83**	-6.23	-0.38	4.73	-0.02	4.90	0.37	**16.94**	-0.15	-18.76	0.01	1.83
11	-2.69	9.94	**1.22**	-8.99	0.33	-1.32	0.46	7.76	0.54	**11.54**	-0.31	-14.61	-0.01	1.67
12	1.82	15.43	**4.09**	1.02	1.86	**17.79**	0.45	5.63	1.25	11.36	-0.93	-16.48	0.49	1.00
13	-0.26	**12.95**	0.38	-5.59	0.12	5.62	-0.55	3.98	**0.43**	9.56	-0.32	-16.62	0.02	1.65
14	-0.64	**7.51**	**0.59**	-2.77	-0.20	-0.51	-0.07	7.48	0.47	4.93	-0.35	-13.75	0.04	1.61
15	-0.39	2.12	**1.47**	0.98	-0.65	6.19	0.57	1.69	0.41	**9.35**	-0.49	-15.40	0.04	1.53

Table 9-773. Summary of Cd apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	-0.03	-0.19	**0.13**	**0.04**	-0.05	0.01	-0.02	-0.07	0.01	0.02	-0.01	0.00	0.00	0.00
2	-0.02	-0.05	**0.08**	**0.11**	-0.01	0.04	-0.01	-0.05	0.01	0.00	-0.02	-0.01	0.00	0.00
3	0.06	**0.09**	**0.12**	-0.04	-0.04	0.01	0.03	-0.01	-0.03	0.02	0.03	0.01	-0.01	0.00
4	**0.03**	0.02	0.00	0.02	0.03	**0.05**	-0.02	-0.02	0.00	0.01	-0.01	0.01	0.00	0.00
5	-0.01	**2.89**	**0.04**	0.62	0.02	-0.05	-0.02	-0.55	0.01	0.02	-0.01	-0.07	0.00	-0.04
6	**0.03**	**0.56**	0.03	-0.24	0.01	0.18	-0.01	-0.12	0.00	0.02	-0.02	-0.03	0.00	-0.01
7	-0.02	**0.12**	**0.04**	-0.03	0.00	0.04	-0.02	0.06	0.00	-0.05	0.00	0.06	0.00	0.00
8	**0.16**	**0.12**	0.15	-0.16	-0.20	0.05	0.07	0.00	0.02	-0.01	-0.08	-0.02	0.00	0.00
9	0.00	0.06	0.00	-0.09	**0.03**	**0.07**	-0.01	-0.04	0.03	0.02	-0.03	0.02	0.00	0.00
10	0.00	**0.24**	-0.02	-0.08	0.01	0.05	**0.02**	-0.06	-0.02	0.01	0.01	-0.01	0.00	0.00
11	-0.03	0.07	**0.03**	**0.30**	0.02	-0.17	-0.01	-0.03	-0.02	0.00	0.00	0.01	0.00	0.00
12	0.00	0.00	-0.03	-0.04	**0.02**	-0.05	0.01	0.01	0.01	-0.04	-0.02	**0.02**	0.00	0.00
13	0.02	**0.21**	0.03	0.00	-0.03	0.00	**0.04**	0.04	-0.04	0.01	0.01	0.02	0.01	0.00
14	0.01	**0.14**	-0.03	-0.04	**0.03**	0.01	-0.01	0.00	0.01	0.02	0.02	0.00	0.00	0.00
15	-0.03	**0.08**	-0.03	-0.08	**0.02**	0.02	0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.00	0.00

Table 9-774. Summary of Zn apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	**43.81**	12.21	-29.14	26.17	-12.44	-13.15	-7.27	-5.13	23.91	**34.15**	-2.08	-3.67
2	**52.45**	**18.16**	-52.28	4.28	-5.14	-17.82	-5.56	-1.89	23.79	15.73	-2.26	-2.03
3	**88.57**	**37.98**	-95.06	-8.34	-15.52	-22.73	-2.27	-3.31	17.89	13.75	-2.08	-1.94
4	14.02	14.02	21.11	8.43	-1.09	-17.94	-11.89	-1.34	**23.04**	**18.57**	-2.23	-2.32
5	**43.62**	10.67	-21.92	20.16	-5.42	0.27	-9.33	-7.16	25.90	**21.86**	-2.56	-2.51
6	**49.85**	**142.52**	-23.42	-72.30	-18.14	12.71	-6.96	-25.20	19.57	15.49	-2.09	-2.57
7	**31.77**	-4.52	8.43	**62.28**	-36.51	-51.12	-4.27	1.04	14.17	26.33	-1.56	-0.76
8	**47.37**	**72.40**	-7.94	-52.88	-34.39	-1.17	-5.42	-2.45	15.82	2.57	-1.25	0.43
9	25.41	12.46	11.92	19.09	-2.07	-21.82	-8.17	-3.07	**26.27**	**19.27**	-2.54	-2.51
10	**44.83**	**42.40**	-27.18	-6.56	10.48	-14.47	-10.50	0.00	15.29	16.87	-1.71	-3.29
11	22.54	**23.57**	**37.95**	-6.29	-34.50	-0.21	-7.62	-8.06	14.34	17.74	-1.53	-2.22
12	**37.81**	11.80	-17.84	-8.03	37.32	-4.95	-20.34	-3.89	20.30	**14.04**	-2.03	-1.67
13	8.70	**47.50**	8.51	24.33	**85.95**	8.21	-32.42	0.47	27.88	25.67	-0.39	-1.72
14	**74.54**	**92.00**	70.19	-24.53	0.18	17.22	20.97	6.86	63.18	21.33	10.23	-1.28
15	**32.16**	**53.79**	-35.57	-30.82	n.a.	-20.89	n.a.	-6.19	21.22	7.67	-2.40	-1.15

Table 9-775. Summary of Cr apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	**0.63**	-0.37	0.62	0.00	0.12	0.00	0.04	0.00	0.25	**2.02**	0.17	-1.42	0.02	0.19
2	**0.96**	0.00	0.33	0.00	0.56	1.10	-0.33	0.50	0.87	**3.57**	0.17	-3.29	-0.08	0.20
3	**1.83**	0.83	-0.49	-2.02	0.71	-0.01	-0.17	**1.19**	1.50	0.55	-0.86	-1.22	-0.08	0.07
4	0.29	0.00	**2.00**	**2.16**	0.45	-1.62	0.63	0.05	-0.38	0.68	-0.66	-0.51	-0.01	0.11
5	0.40	0.31	**1.56**	-0.24	1.16	0.35	0.14	0.47	0.07	**0.76**	-0.94	-1.05	-0.03	0.18
6	0.25	0.00	**1.93**	0.27	0.96	0.42	0.31	**1.16**	-0.05	0.83	-0.80	-1.64	0.02	0.24
7	-1.26	0.00	**2.96**	**2.02**	-0.26	-0.76	0.06	1.52	0.63	0.39	-0.80	-1.64	-0.04	0.38
8	2.01	-0.36	**3.70**	1.06	-1.70	-0.62	-0.51	**1.55**	0.60	0.68	-0.59	-2.34	-0.04	0.27
9	-0.71	0.00	**1.57**	**1.55**	0.23	-0.01	-0.14	0.50	0.30	1.31	0.65	-1.73	-0.11	0.09
10	0.46	-0.12	0.30	0.09	0.39	0.83	-0.55	0.50	0.03	**1.65**	**0.74**	-1.87	-0.09	0.11
11	-0.44	-1.60	**1.32**	0.00	0.50	0.39	-0.52	0.74	0.44	**0.77**	0.48	-1.21	-0.05	0.14
12	0.31	-0.26	0.35	0.30	1.48	0.73	-0.98	1.24	**1.89**	**2.14**	-0.26	-2.75	-0.06	0.16
13	**1.27**	-0.54	-0.51	-1.07	-0.60	**0.57**	0.33	0.11	0.24	0.26	0.11	-0.31	-0.03	0.26
14	-0.60	-1.21	**1.08**	0.00	0.57	0.39	-0.57	-0.19	0.47	**1.62**	0.04	-1.06	0.04	0.27
15	-0.39	-0.23	**0.84**	**0.89**	-0.09	-0.37	-0.01	0.30	0.75	0.45	-0.07	-0.65	-0.07	0.09

Table 9-776. Summary of Co apparent net diffusion rates after River Murray and seawater inundation (x 10^{-6} moles m^{-2} day^{-1}). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
Site	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**	**RM**	**SW**
1	0.25	1.73	**0.72**	**2.59**	-0.47	-1.70	-0.16	-1.17	0.08	-0.42	-0.01	-0.19	-0.01	0.02
2	**0.06**	0.00	0.00	**1.13**	-0.02	-0.51	0.01	0.03	0.02	-0.01	-0.04	-0.13	0.00	0.02
3	0.31	-0.28	-0.02	**0.35**	-0.22	-0.22	0.10	0.05	-0.07	-0.07	**0.56**	0.05	-0.08	-0.02
4	0.02	-0.21	**0.28**	-0.12	0.03	**0.22**	0.09	0.07	-0.09	-0.18	-0.08	-0.07	0.00	0.00
5	0.01	**6.70**	**0.13**	1.16	0.09	-1.30	0.00	-1.79	-0.05	-0.76	-0.01	-0.40	0.00	-0.02
6	0.03	**63.26**	**0.06**	-3.68	-0.07	5.07	0.05	-13.58	-0.03	-0.83	-0.02	-3.25	0.00	-0.93
7	-0.33	**9.44**	**0.03**	3.70	-0.10	2.48	0.01	2.71	0.00	4.16	-0.03	4.11	-0.01	0.53
8	0.76	**7.86**	**1.17**	5.83	-1.25	5.87	0.24	-2.50	-0.17	2.15	-0.01	-1.16	0.00	0.00
9	0.06	0.00	**0.22**	**0.39**	-0.07	0.34	0.01	-0.27	0.03	0.04	0.00	-0.02	0.00	0.00
10	-0.18	**24.99**	0.06	0.65	**0.07**	-0.34	0.06	-0.79	-0.09	3.77	-0.03	-2.63	0.00	-1.00
11	-0.94	0.99	0.26	**2.45**	**1.50**	0.72	-0.88	0.89	-0.02	-0.53	0.00	-0.99	0.00	-0.04
12	0.02	**0.51**	**0.16**	-0.17	-0.05	-0.20	0.00	0.03	0.02	0.02	0.00	-0.11	0.00	0.00
13	0.48	**11.73**	**0.65**	4.17	-0.62	2.62	0.31	1.28	-0.10	2.39	0.07	1.07	0.46	0.18
14	0.07	**13.39**	**1.98**	8.80	0.19	5.48	0.69	1.61	0.68	3.00	0.42	3.08	0.45	0.08
15	-0.06	**3.67**	**0.24**	1.69	-0.06	-0.23	0.02	-0.01	0.02	-2.61	-0.02	-0.06	-0.01	0.00

Appendix 6. Dissolved sulfide water quality data

Table 9-777. Selected surface water and pore-water properties after inundation of the Waltowa soil material (Site 1): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	**46**	*14*	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	**40**	*44*	<30	-
18	<30	-	<30	-	**43**	*47*	<30	-	**69**	*24*	<30	-
25	<30	-	<30	-	<30	-	<30	-	**37**	*6*	<30	-
35	<30	-	<30	-	<30	-	<30	-	**34**	*24*	<30	-
136	<30	-	<30	-	**34**	*67*	31	*7*	<30	-	<30	-

Table 9-778. Selected surface water and pore-water properties after inundation of the Waltowa soil material (Site 2): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-779. Selected surface water and pore-water properties after inundation of the Meningie soil material (Site 3): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

* Sulfide as un-ionised H_2S. The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-780. Selected surface water and pore-water properties after inundation of the Meningie soil material (Site 4): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-781. Selected surface water and pore-water properties after inundation of the Tolderol soil material (Site 5): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-782. Selected surface water and pore-water properties after inundation of the Tolderol soil material (Site 6): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-783. Selected surface water and pore-water properties after inundation of the Point Sturt (South) soil material (Site 7): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

* Sulfide as un-ionised H_2S. The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-784. Selected surface water and pore-water properties after inundation of the Point Sturt (North) soil material (Site 8): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	**164**	*318*	180	*330*	**88**	*7*	431	*62*

Table 9-785. Selected surface water and pore-water properties after inundation of the Point Sturt (North) soil material (Site 9): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-786. Selected surface water and pore-water properties after inundation of the Milang soil material (Site 10): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	**31**	*63*	<30	-	<30	-	121	*243*
18	<30	-	<30	-	**104**	*152*	<30	-	<30	-	151	*26*
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	**43**	*55*	<30	-	**142**	*8*	<30	-
136	<30	-	<30	-	<30	-	<30	-	**58**	*27*	32	<1

Table 9-787. Selected surface water and pore-water properties after inundation of the Milang soil material (Site 11): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	35	-	<30	-	<30	-	<30	-	<30	-

* Sulfide as un-ionised H_2S. The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Table 9-788. Selected surface water and pore-water properties after inundation of the Ewe Island Barrage soil material (Site 12): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-

Table 9-789. Selected surface water and pore-water properties after inundation of the Currency Creek soil material (Site 13): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	**47**	*10*	52	*40*

Table 9-790. Selected surface water and pore-water properties after inundation of the Poltalloch Station soil material (Site 14): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	**539**	*1043*	283	*114*	**736**	*12*	925	*251*

Table 9-791. Selected surface water and pore-water properties after inundation of the Poltalloch Station soil material (Site 15): Dissolved sulfide. (The values in bold red text exceed the relevant water quality guideline).

	Dissolved Sulfide Surface water (ppb)				Dissolved Sulfide Pore-water (3-5 cm) (ppb)				Dissolved Sulfide Pore-water (10-12 cm) (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
Days	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**	**Av.**	**±**
WQG*	**2.6**		**n.a.**		**2.6**		**n.a.**		**2.6**		**n.a.**	
0.08	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
4	<30	-	<30	-	<30	-	<30	-	<30	-	35	*47*
7	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
18	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
25	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
35	<30	-	<30	-	<30	-	<30	-	<30	-	<30	-
136	<30	-	<30	-	<30	-	<30	-	**36**	*72*	<30	-

* Sulfide as un-ionised H_2S. The WQGs are the ANZECC trigger values for freshwaters and marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000).

Appendix 7. Sulfate Reduction Rate Data Using $^{35}SO_4^{2-}$ Incubation Method

Table 9-792. Mean sulfate reduction rates for Murray water treatment: depth 0-4 cm (in units of nmol/cm³/day).

Site No.	Rep 1	Rep 2	Rep 3	Av.	S.D.
1	0.564	0.017	0.269	0.283	0.273
2	0.167	0.121	0.000	0.096	0.086
3	0.000	0.000	0.000	0.000	0.000
4	0.193	0.426	0.020	0.213	0.204
5	0.239	0.297	0.000	0.179	0.158
6	7.560	0.000	0.000	2.520	4.365
7	0.000	0.000	0.000	0.000	0.000
8	0.159	0.000	0.000	0.053	0.092
9	0.000	0.000	0.000	0.000	0.000
10	0.000	0.159	0.000	0.053	0.092
11	7.273	13.401	0.029	6.901	6.694
12	5.116	5.303	5.941	5.453	0.433
13	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000
15	0.096	2.228	0.099	0.808	1.230

Note: Values shown as 0.000 are less than the method detection limit.

Table 9-793. Mean sulfate reduction rates for Murray water treatment: depth 4-8 cm (in units of nmol/cm³/day).

Site No.	Rep 1	Rep 2	Rep 3	Av.	S.D.
1	0.256	0.317	0.541	0.372	0.150
2	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000
4	0.007	0.000	0.000	0.002	0.004
5	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000
10	n.a.	0.000	0.071	0.035	0.050
11	0.931	0.734	0.695	0.786	0.127
12	0.903	0.602	0.356	0.620	0.274
13	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000
15	0.000	0.001	0.003	0.001	0.002

Note: Values shown as 0.000 are less than the method detection limit.

Table 9-794. Mean sulfate reduction rates for seawater treatment: depth 0-4 cm (in units of nmol/cm³/day).

Site No.	Rep 1	Rep 2	Rep 3	Av.	S.D.
1	2.640	1.160	0.003	1.268	1.322
2	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000
10	0.000	0.319	0.096	0.138	0.164
11	0.078	2.897	0.038	1.004	1.640
12	3.343	2.736	2.119	2.733	0.612
13	0.000	0.000	0.000	0.000	0.000
14	2.300	0.876	0.000	1.059	1.161
15	0.191	3.507	0.000	1.233	1.972

Note: Values shown as 0.000 are less than the method detection limit.

Table 9-795. Mean sulfate reduction rates for seawater treatment: depth 4-8 cm (in units of nmol/cm³/day).

Site No.	Rep 1	Rep 2	Rep 3	Av.	S.D.
1	0.000	0.482	0.520	0.334	0.290
2	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000
10	0.069	0.000	0.000	0.023	0.040
11	0.770	0.965	0.000	0.578	0.510
12	n.a.	0.222	0.118	0.170	0.074
13	0.000	0.000	0.000	0.000	0.000
14	0.468	0.224	0.489	0.394	0.148
15	0.000	0.451	0.000	0.150	0.260

Note: Values shown as 0.000 are less than the method detection limit.

Appendix 8. Additional graphs

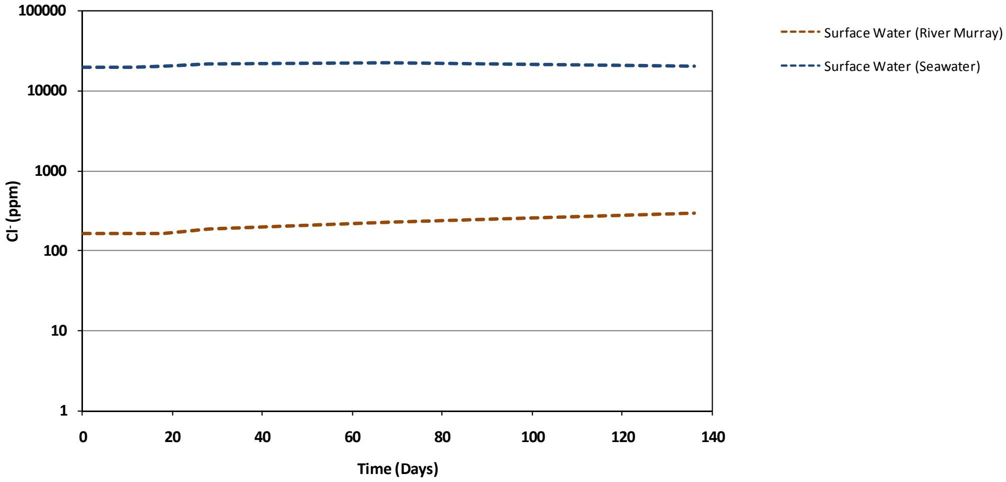

Figure 9-1. Chloride (Cl) concentration of the surface water in columns containing no sediment over 136 days of inundation.

Appendix 9. Water Quality Guideline Trigger Values

Table 9-796. Water Quality Guideline trigger values for freshwater and marine water (from ANZECC/ARMCANZ (2000)).

Chemical		Trigger values for freshwater (ppb)		Trigger values for marine water (ppb)	
		Level of protection (% species)		Level of protection (% species)	
		95%	80%	95%	80%
Metals & Metalloids					
Aluminium	pH>6.5	55	150	ID	ID
Aluminium	pH<6.5	ID	ID	ID	ID
Arsenic (As III)		24	360	ID	ID
Cadmium		1.1 A	4.6 A	5.5	36
Chromium (Cr VI)		1.0	40	4.4	85
Cobalt		ID	ID	1	150
Copper		7.3 A	13 A	1.3	8
Lead		40.1 A	110.9 A	4.4	12
Manganese		1,900	3,600	ID	ID
Nickel		57.2 A	88.4 A	70	560
Zinc		41.6 A	161.2 A	15	43
Non-Metallic Inorganics					
Ammonia		900	2,300	910	1,700
Nitrate		700	17,000	ID	ID

A. Hardness category of 'Very Hard' has been applied to the trigger values of selected metals in freshwaters.
ID = Insufficient data to derive trigger values.