

# 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  GOOD**

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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

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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



## 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<sub>3</sub> 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<sub>3</sub> when seawater was used. The inundating waters for two sites also exceeded the recommended water quality guidelines for NH<sub>3</sub> 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.

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# 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 ( $\text{FeS}_2$ ) 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  $\mu\text{mol g}^{-1}$  (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 (Ponnampereuma *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 (Ponnampereuma 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 (Ponnampereuma, 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<sub>3</sub>, NO<sub>x</sub>) (Sullivan *et al.* 2008). Sullivan *et al.* (2008) also found that while oxalic 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  $\mu\text{mol H}^+ \text{g}^{-1}$ ) 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 ecotoxicology 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 ( $\sim 300 \mu\text{g L}^{-1}$ ) 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.

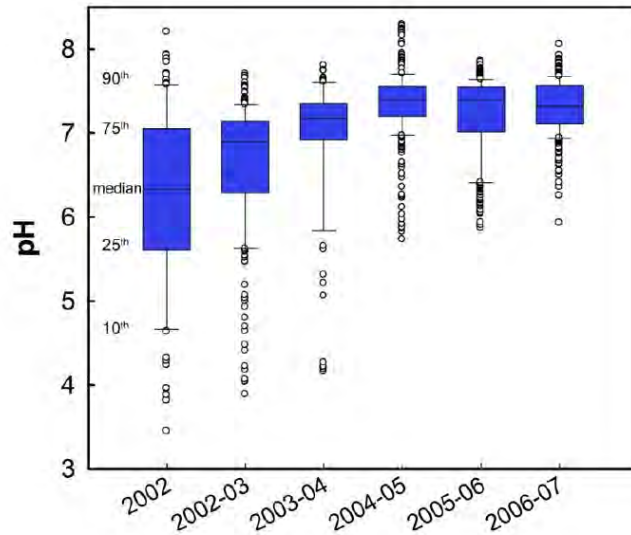


Figure 3-1. Improvements in surface water pH over time at Firewood Creek following the reintroduction of tidal exchange / inundation (source: Johnston *et al.* 2009c).

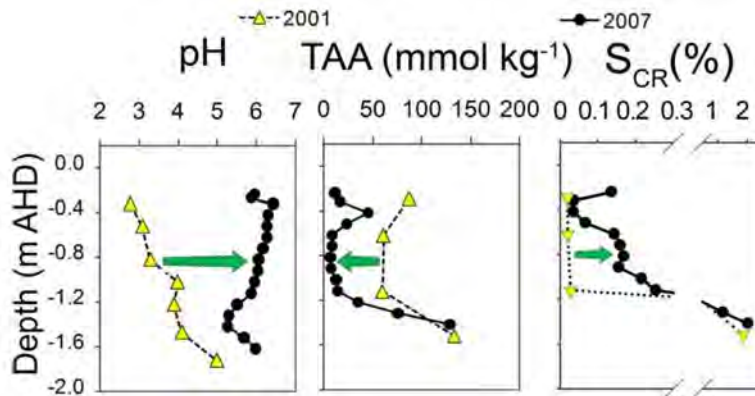


Figure 3-2. Examples of changes in key soil properties before (2001) vs. after (2007) reintroduction of tidal inundation. Arrows represent direction of change (source: Johnston *et al.* 2009c).

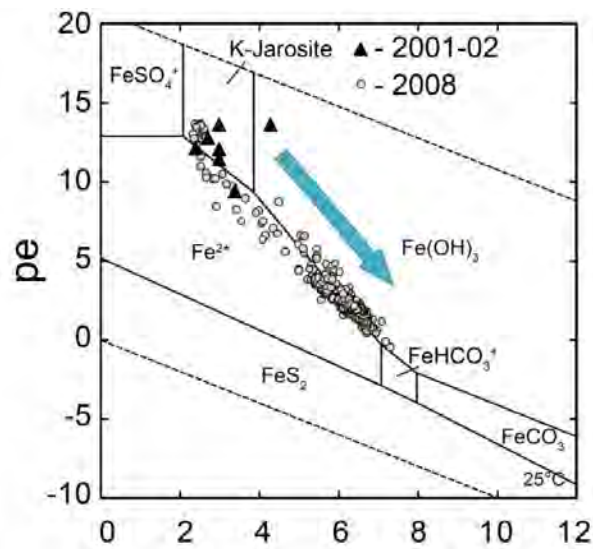


Figure 3-3. pE-pH diagram for pore-water before (2001-02) and after (2008) tidal inundation. Stability fields of relevant Fe species are shown with an arrow indicating the direction of change (source: Johnston *et al.* 2009c).

## 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.

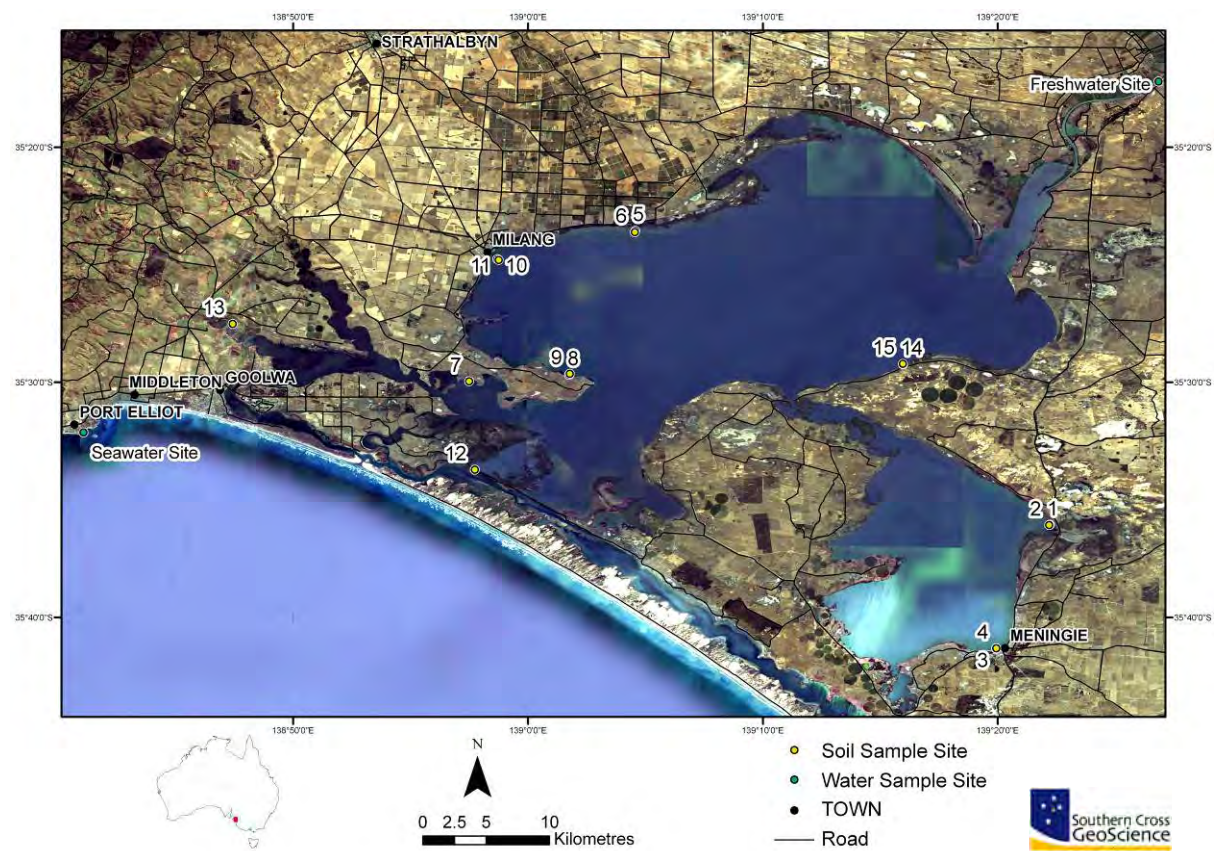


Figure 4-1. Map showing sediment and water sampling sites in the Lower Lakes.



## 4.2 Sampling and analysis methodology

### 4.2.1 Field sampling of soils

Field sampling at the Lower Lakes sites was undertaken between 12<sup>th</sup> and 16<sup>th</sup> 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 15<sup>th</sup> June 2009 from the pier next to Port Elliot S.L.S.C. River Murray water (495 litres) was collected on 16<sup>th</sup> June 2009 downstream from Fred's Boat Ramp between Wellington and Taillem 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<sub>4</sub>, 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<sub>3</sub> 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<sub>KCl</sub>) 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<sub>BT</sub>) was quantified using a standard back-titration determination (Method Code 19A2) (Ahern *et al.* 2004).

Major cations and anions (Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, SO<sub>4</sub><sup>2-</sup>, Cl<sup>-</sup>) in a 1:5 soil:water extract were analysed by ICP-OES. Total metal and metalloid concentrations were determined by aqua-regia (HNO<sub>3</sub>: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<sup>2+</sup>), total iron (Fe<sup>2+</sup> + Fe<sup>3+</sup>), 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<sup>3+</sup>) 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<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, SO<sub>4</sub><sup>2-</sup>, Cl<sup>-</sup>) 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<sub>3</sub>) for preservation.

#### 4.2.4.4 Sulfate reduction analyses

In-situ SO<sub>4</sub><sup>2-</sup>-reduction rates (SRR) were determined at day 136 of the inundation using a radiotracer (<sup>35</sup>SO<sub>4</sub><sup>2-</sup>) 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 <sup>35</sup>SO<sub>4</sub><sup>2-</sup>. 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 <sup>35</sup>SO<sub>4</sub><sup>2-</sup>). 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:

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

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 <sup>35</sup>SO<sub>4</sub><sup>2-</sup> per volume of soil, [SO<sub>4</sub><sup>2-</sup>] is the sulfate concentration per volume of soil (nmol/cm<sup>3</sup>), *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  $\pm 5\%$  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.

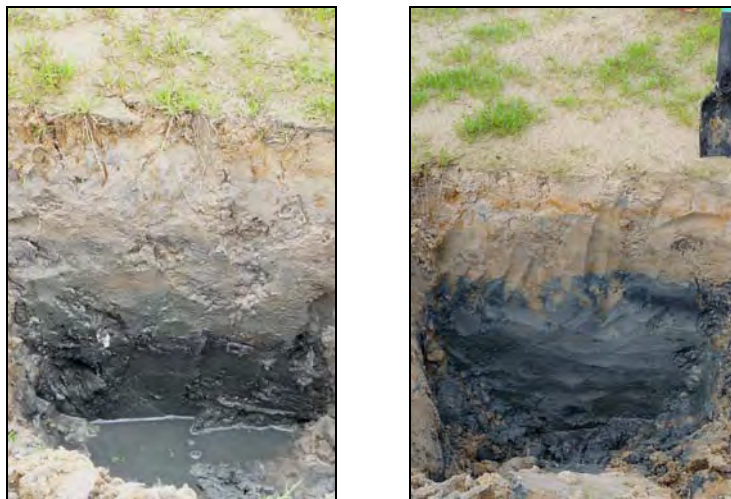


Figure 5-2. Surface soil profiles at Site 1 (left photograph) and Site 2 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

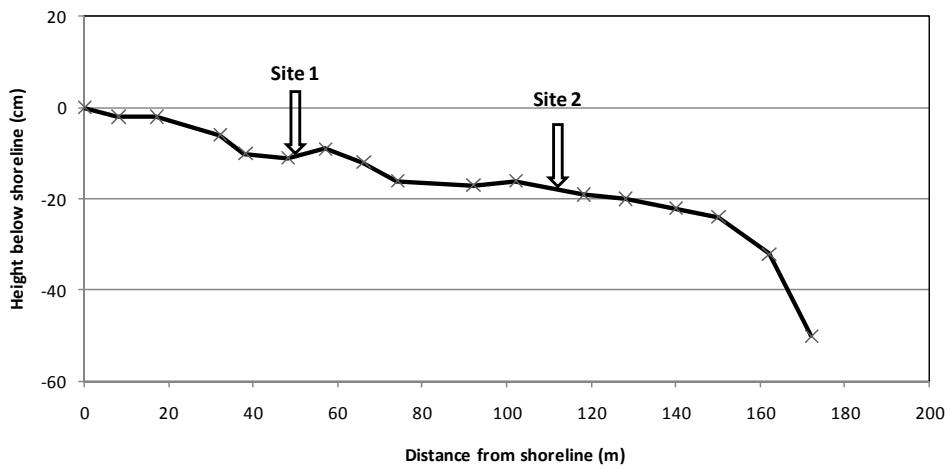


Figure 5-3. Shoreline cross-section at Site 1 and 2.

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.

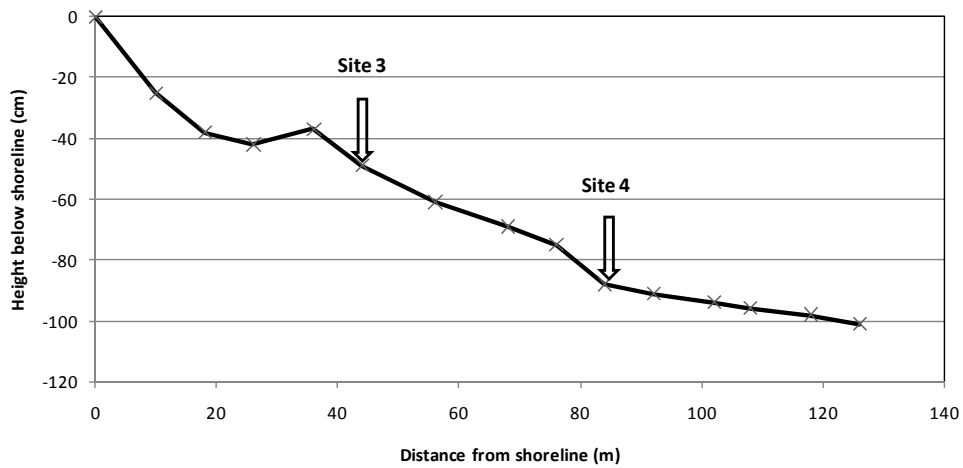


Figure 5-6. Shoreline cross-section at Site 3 and 4.



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.

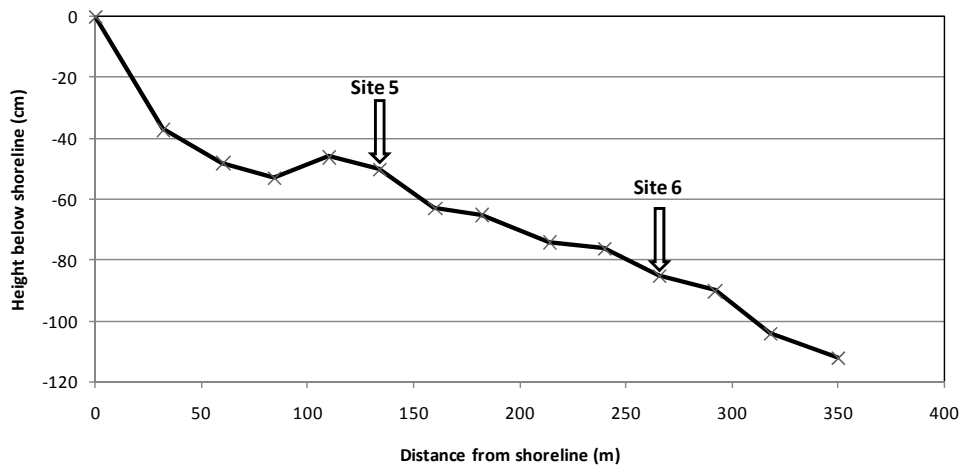


Figure 5-9. Shoreline cross-section at Site 5 and 6.

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.

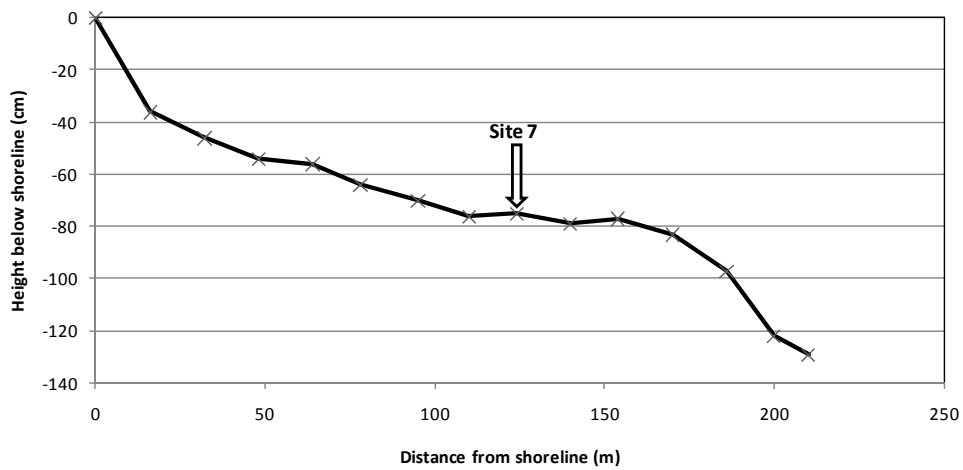


Figure 5-11. Shoreline cross-section at Site 7.

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).

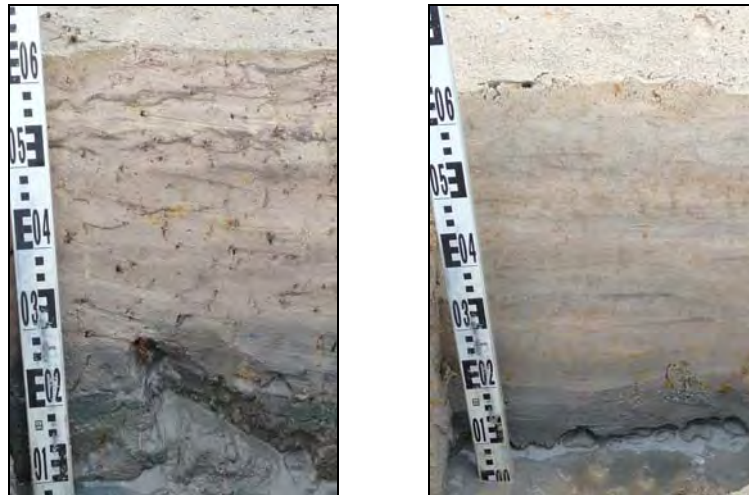


Figure 5-13. Surface soil profiles at Site 8 (left photograph) and Site 9 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

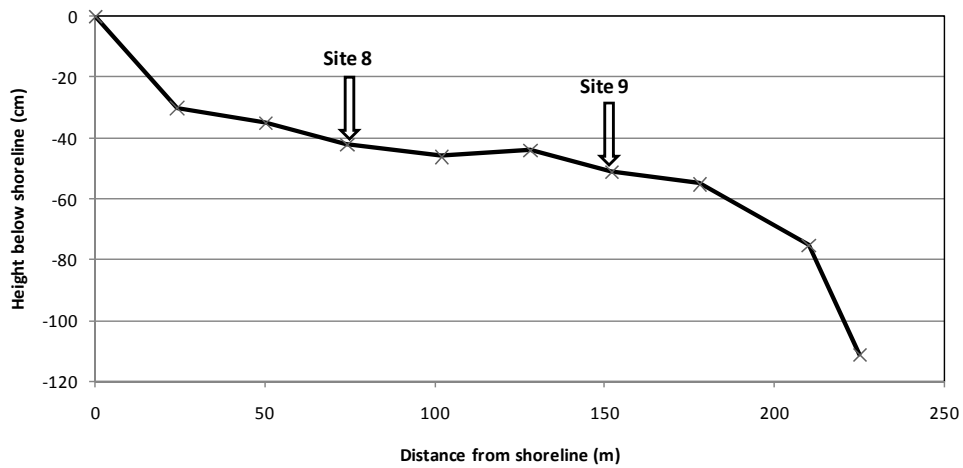


Figure 5-14. Shoreline cross-section at Site 8 and 9.

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



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

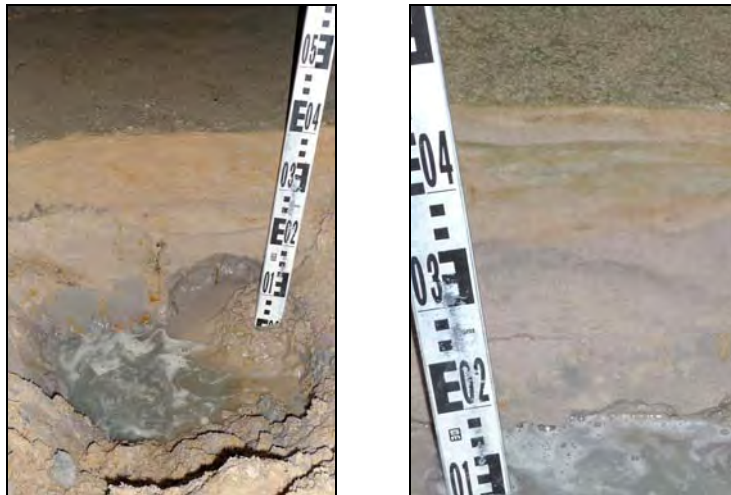


Figure 5-16. Surface soil profiles at Site 10 (left photograph) and Site 11 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

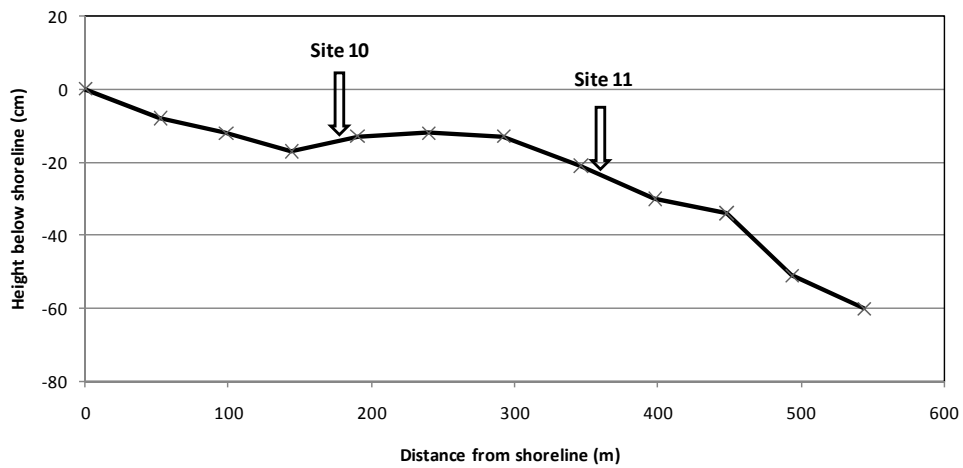


Figure 5-17. Shoreline cross-section at Site 10 and 11.

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.

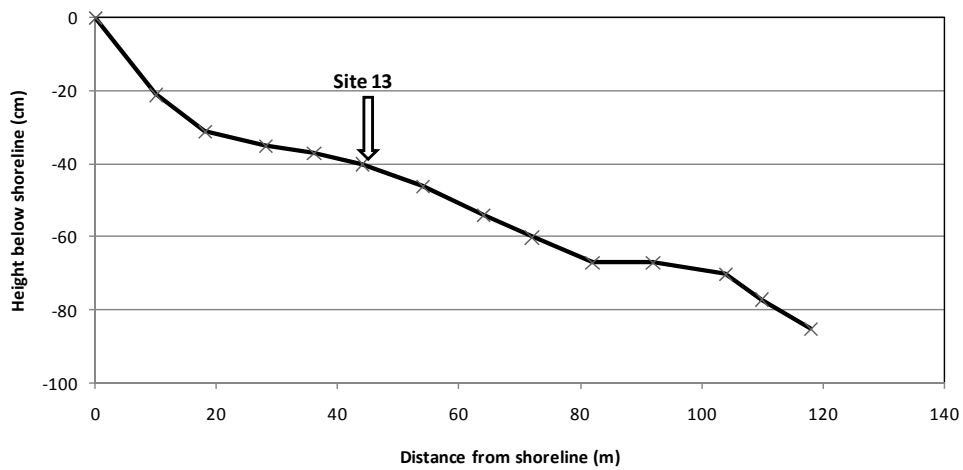


Figure 5-20. Shoreline cross-section at Site 13.

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

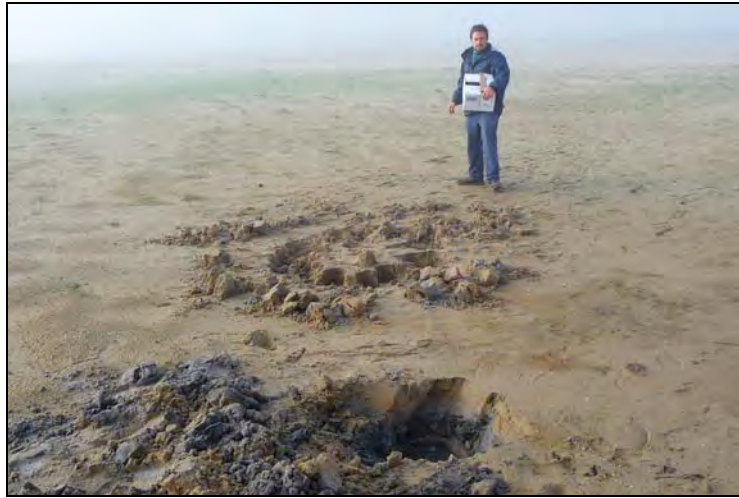


Figure 5-21. Landscape at the Pottaloch Station sampling location (Site 15).

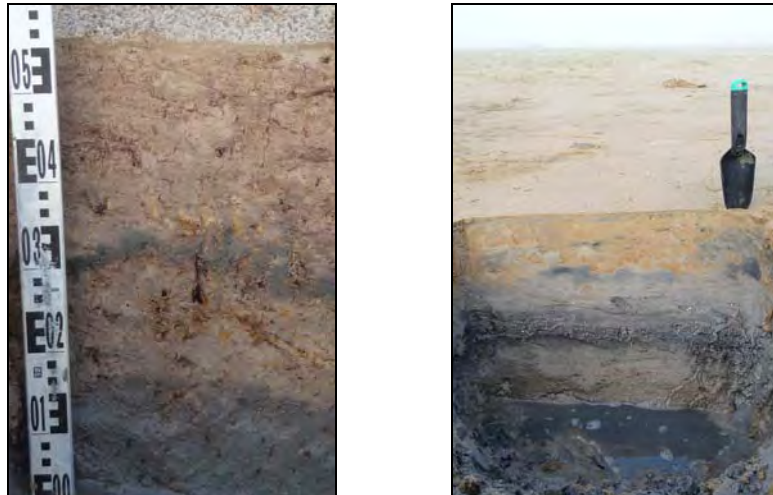


Figure 5-22. Surface soil profiles at Site 14 (left photograph) and Site 15 (right photograph). Profile descriptions at both sites are presented in Appendix 1.

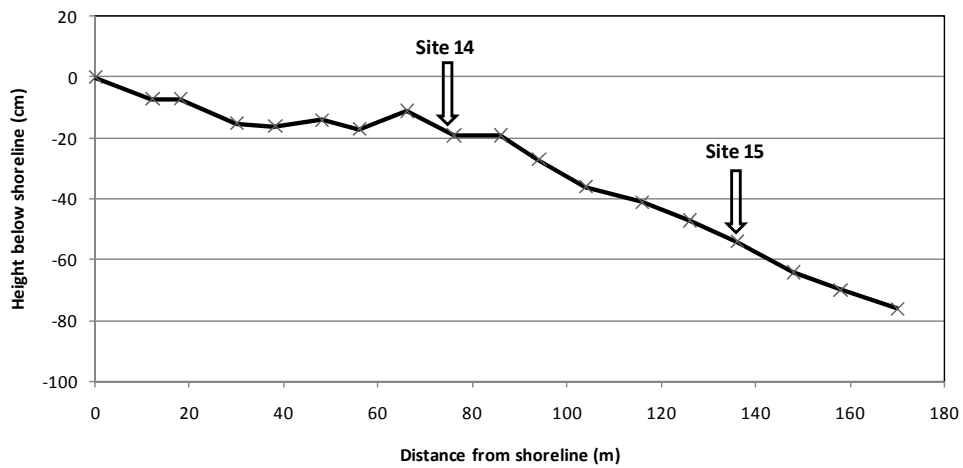


Figure 5-23. Shoreline cross-section at Site 14 and 15.

## 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 ( $\pm$ 0.14)	7.76 ( $\pm$ 0.09)
Redox Potential (Eh)	mV	294 ( $\pm$ 16)	354 ( $\pm$ 32)
Electrical Conductivity (EC)	mS/cm	0.77 (n.a.)	53.13 (n.a.)
Dissolved Oxygen (DO)	mg/L	9.0 ( $\pm$ 0.1)	9.2 ( $\pm$ 0.1)
Alkalinity	mmol/L	1.6 ( $\pm$ <0.1)	3.9 ( $\pm$ <0.1)
Ferrous Iron (Fe <sup>2+</sup> )	ppm	<0.2	<0.2
Ferric Iron(Fe <sup>3+</sup> )	ppm	<0.2	<0.2
Dissolved Sulfide (S <sup>2-</sup> )	ppb	<30	<30
Dissolved Organic Carbon (DOC)	ppm	6.9 (n.a.)	2.9 (n.a.)
Nitrate (NO <sub>3</sub> <sup>-</sup> )	ppm N	0.185 ( $\pm$ 0.035)	0.025 ( $\pm$ 0.007)
Nitrite (NO <sub>2</sub> <sup>-</sup> )	ppm N	0.010 ( $\pm$ <0.001)	<0.005
Ammonia (NH <sub>3</sub> )	ppm N	0.075 ( $\pm$ 0.007)	0.090 ( $\pm$ <0.001)
Orthophosphate (PO <sub>4</sub> <sup>3-</sup> )	ppm P	0.009 ( $\pm$ <0.001)	0.008 ( $\pm$ 0.007)
Chloride (Cl <sup>-</sup> )	ppm	169 ( $\pm$ 14)	20,383 ( $\pm$ 887)
Sulfate (SO <sub>4</sub> <sup>2-</sup> )	ppm	50 ( $\pm$ 11)	2,923 ( $\pm$ 113)
Sodium (Na <sup>+</sup> )	ppm	113 ( $\pm$ 13)	10,462 ( $\pm$ 727)
Potassium (K <sup>+</sup> )	ppm	4.3 ( $\pm$ 0.3)	409.1 ( $\pm$ 25.5)
Calcium (Ca <sup>2+</sup> )	ppm	19.9 ( $\pm$ 1.0)	432.5 ( $\pm$ 33.1)
Magnesium (Mg <sup>2+</sup> )	ppm	15.0 ( $\pm$ 1.5)	1,267 ( $\pm$ 104)
Aluminium (Al)	ppm	0.01 ( $\pm$ < 0.01)	0.01 ( $\pm$ <0.01)
Iron (Fe)	ppm	0.02 ( $\pm$ 0.02)	0.03 ( $\pm$ 0.03)
Manganese (Mn)	ppm	<0.01	<0.01
Arsenic (As)	ppb	<1.0	<15.0
Copper (Cu)	ppb	2.1 ( $\pm$ 0.66)	2.2 ( $\pm$ 1.32)
Nickel (Ni)	ppb	1.5 ( $\pm$ 0.39)	<5.0
Zinc (Zn)	ppb	<1.0	<5.0
Cadmium (Cd)	ppb	<0.1	0.11 ( $\pm$ 0.15)
Cobalt (Co)	ppb	<1.0	<1.0
Chromium (Cr)	ppb	2.4 ( $\pm$ 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup> concentrations were below the ANZECC trigger value.
- NH<sub>3</sub> 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<sub>3</sub> in the pore-waters suggest that the increase of NH<sub>3</sub> in the inundating waters was via upwards diffusion.
- PO<sub>4</sub> concentrations increased markedly in the inundation waters. This effect was greater during inundation with River Murray water. The concentrations of PO<sub>4</sub> in the pore-waters suggest that the increase of PO<sub>4</sub> 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<sub>4</sub> in the pore-waters during inundation with River Murray water (Figure 5-33).

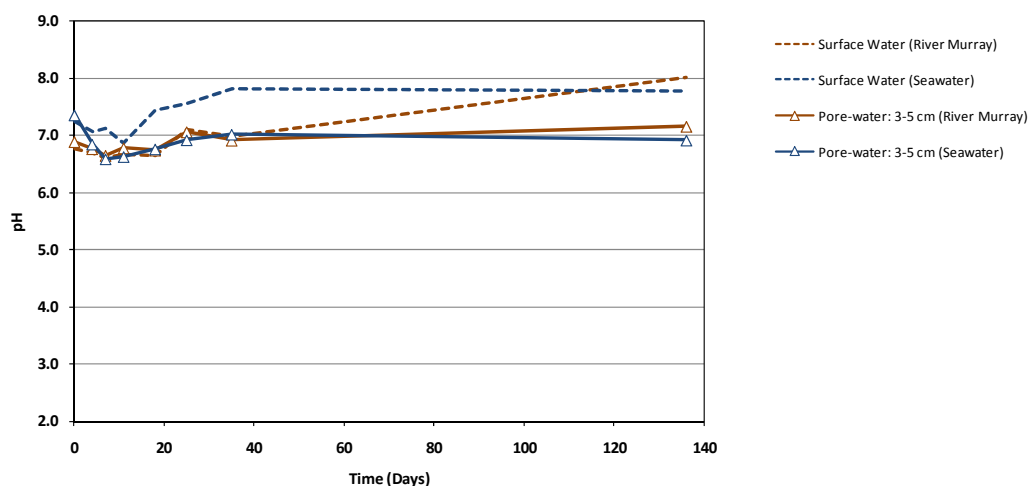


Figure 5-24. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

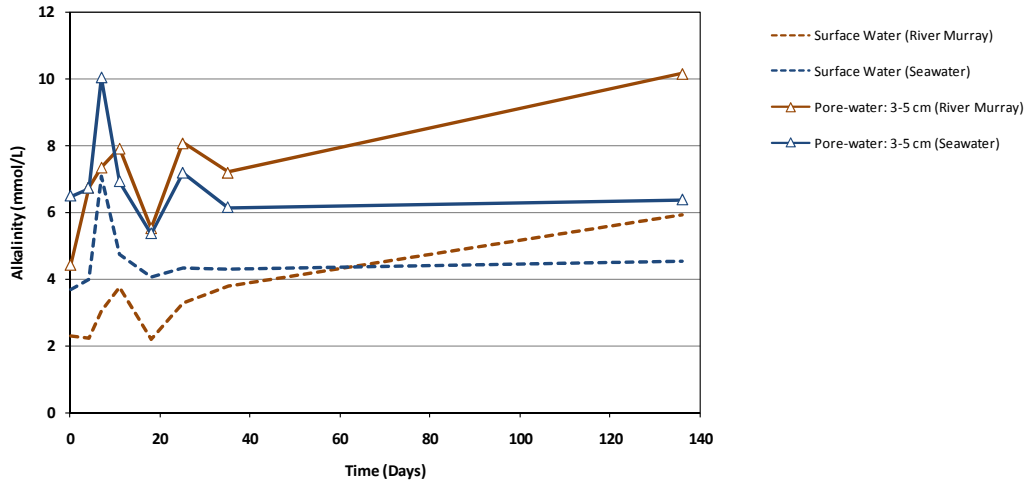


Figure 5-25. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

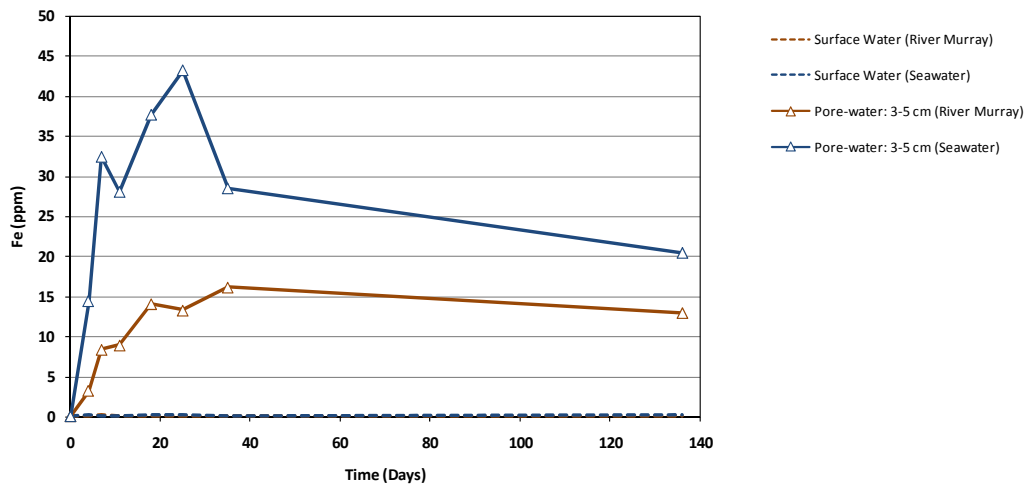


Figure 5-26. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

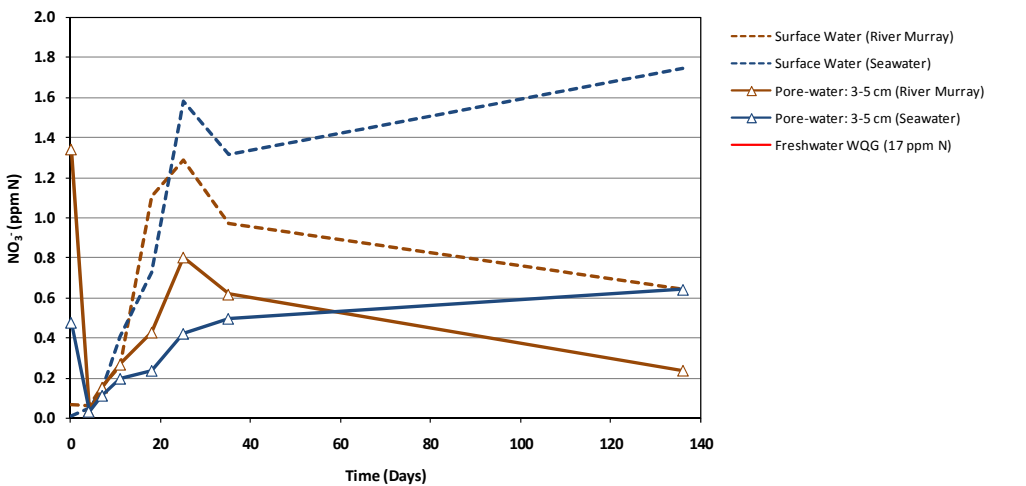


Figure 5-27. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. all values below the freshwater WQG trigger value).

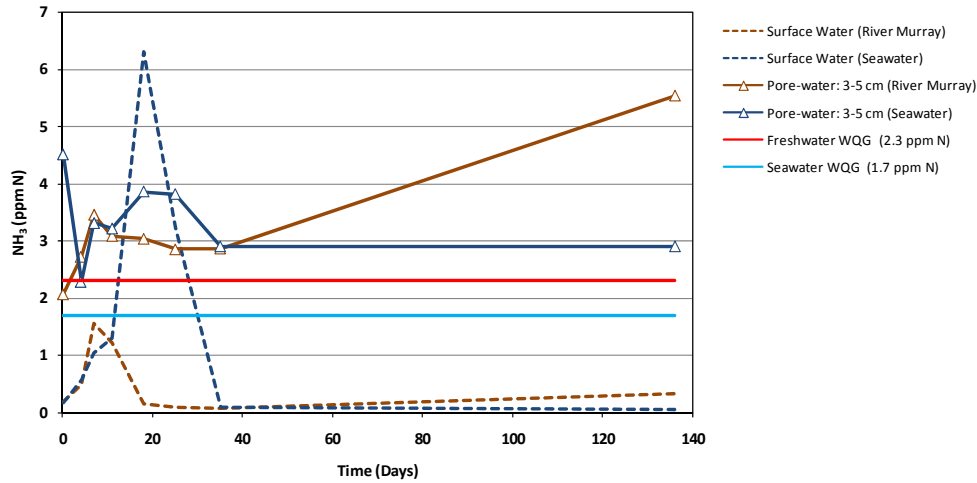


Figure 5-28. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

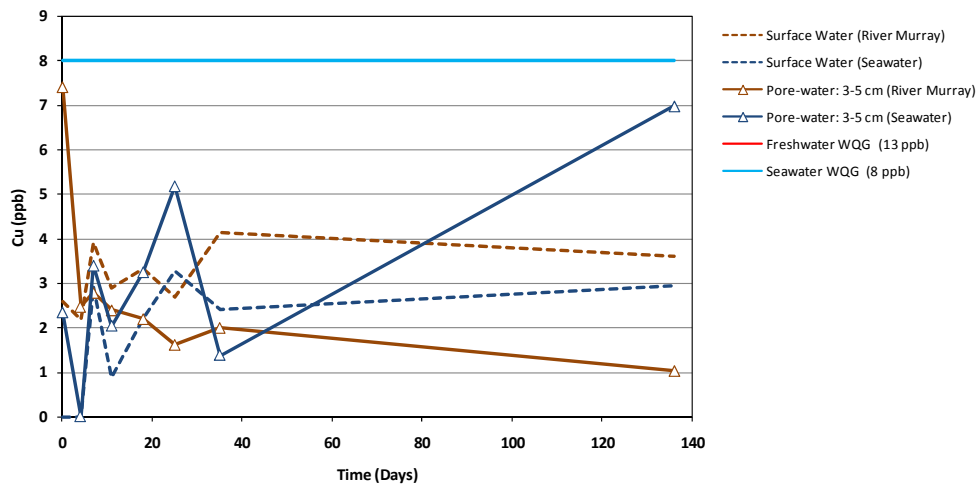


Figure 5-29. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

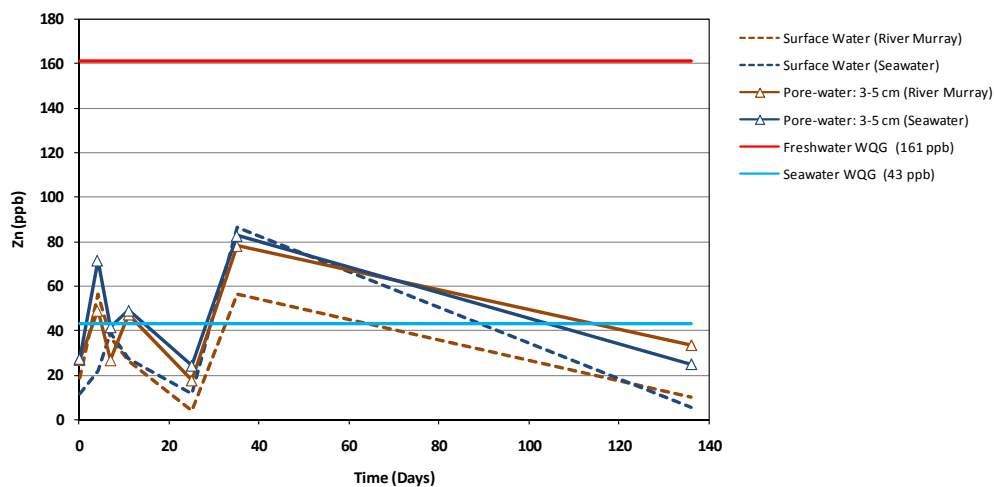


Figure 5-30. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

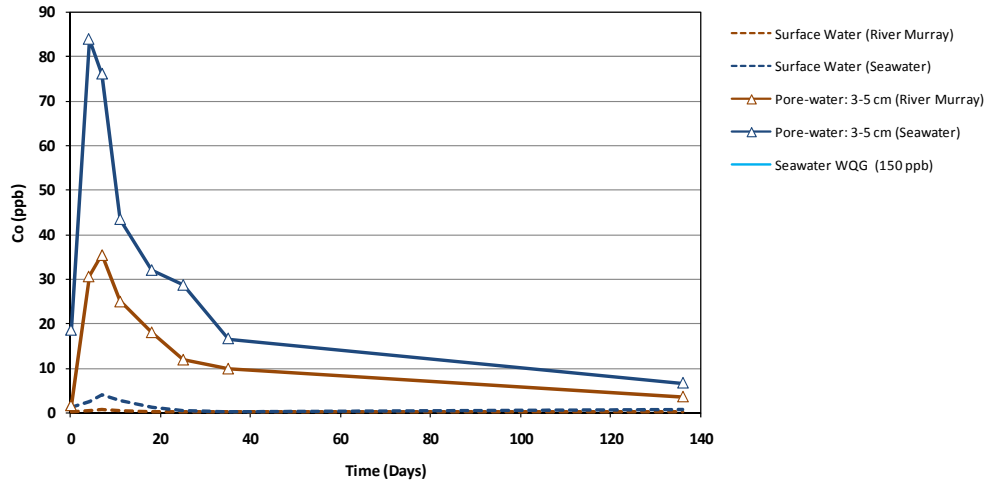


Figure 5-31. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

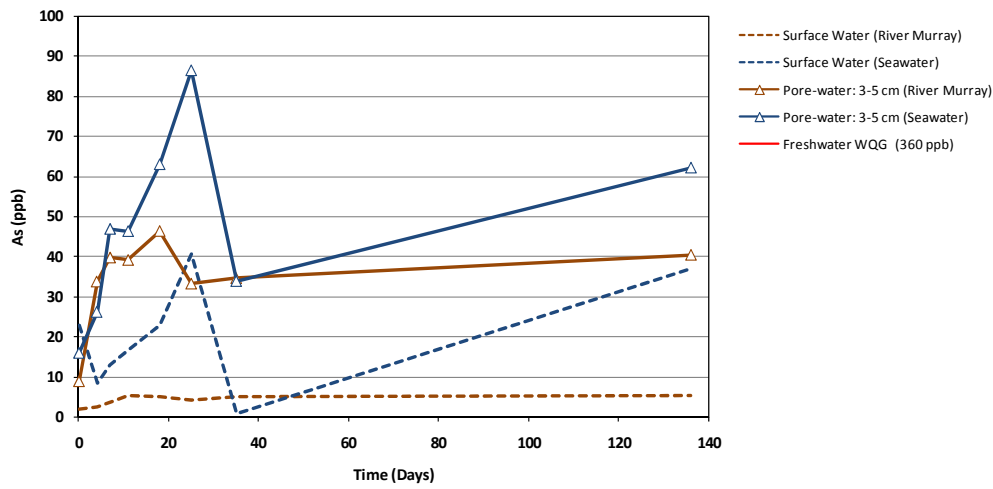


Figure 5-32. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

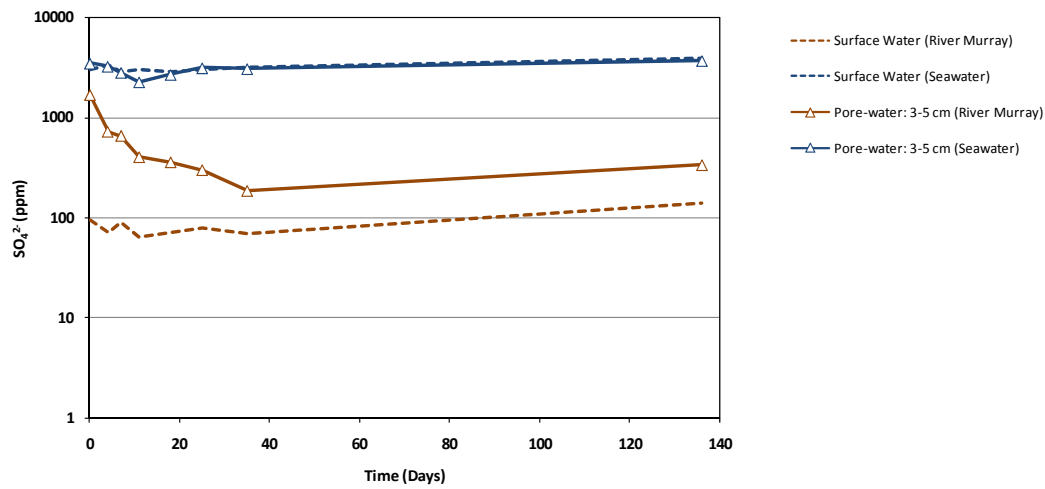


Figure 5-33. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 1.

#### **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<sub>3</sub> and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiche) 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<sub>3</sub> 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<sub>3</sub>, 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<sub>4</sub>.

### 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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  $\text{NO}_3^-$  concentrations were below the ANZECC trigger value (Figure 5-37).

- $\text{PO}_4$  concentrations increased only slightly in the inundation waters. The concentrations of  $\text{PO}_4$  in the pore-waters suggest that the increases in  $\text{PO}_4$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-40).

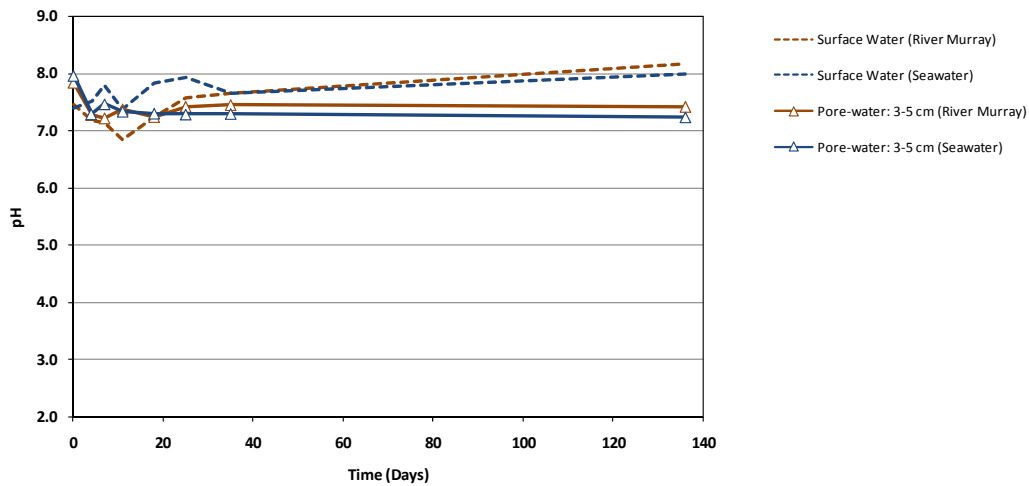


Figure 5-34. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

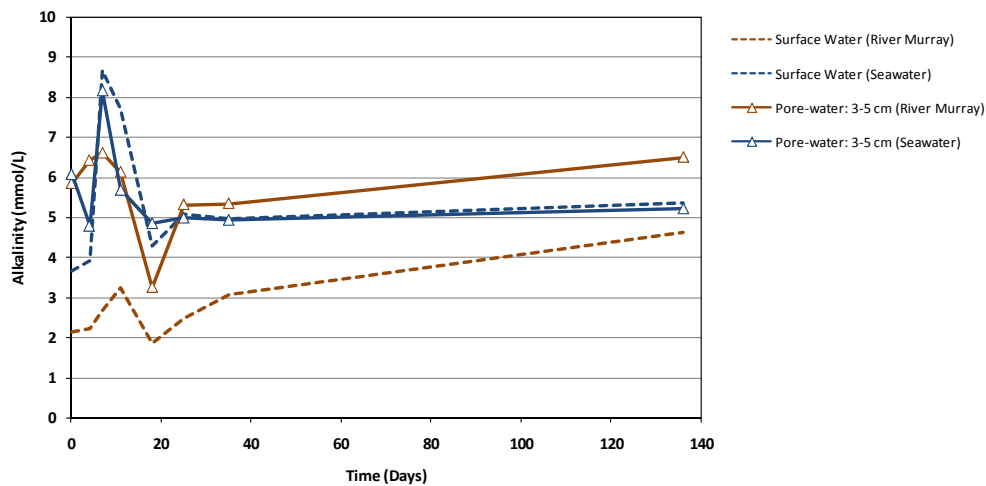


Figure 5-35. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.



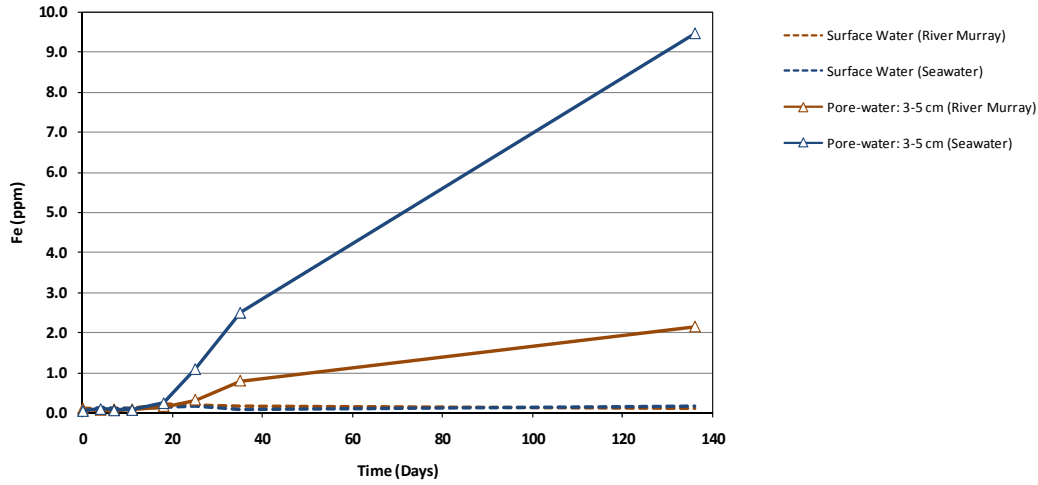


Figure 5-36. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

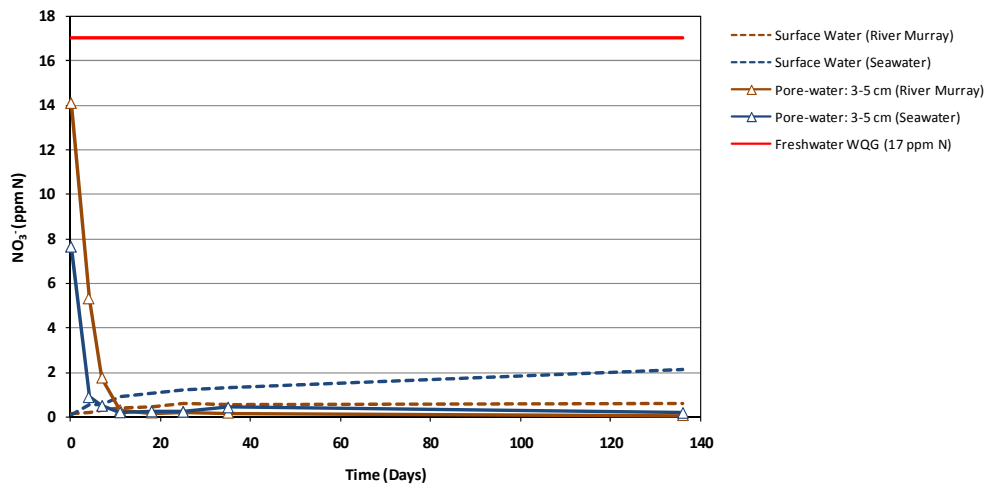


Figure 5-37. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

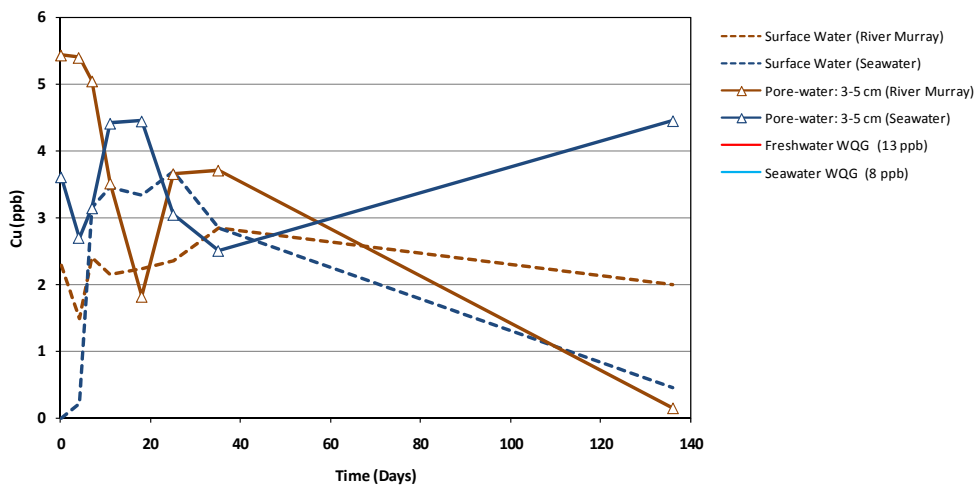


Figure 5-38. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

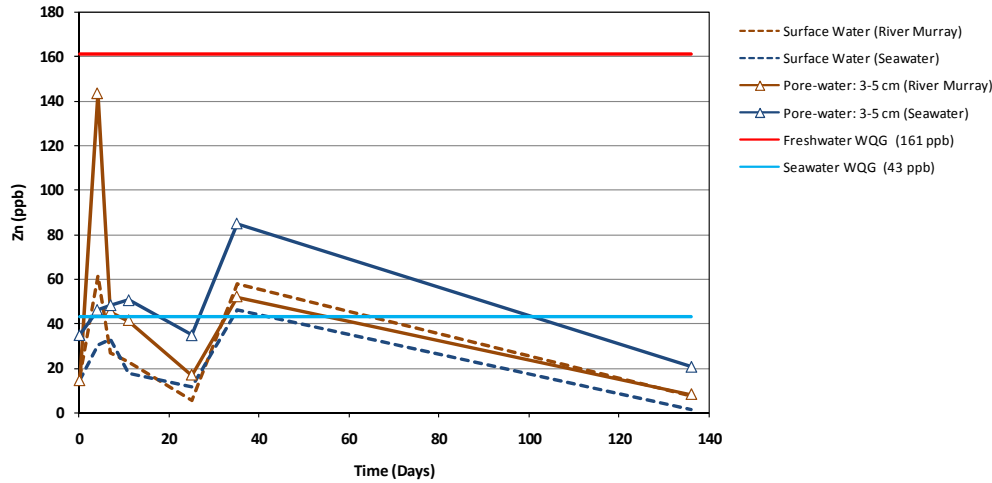


Figure 5-39. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2 (n.b. data below the laboratory LOD plotted).

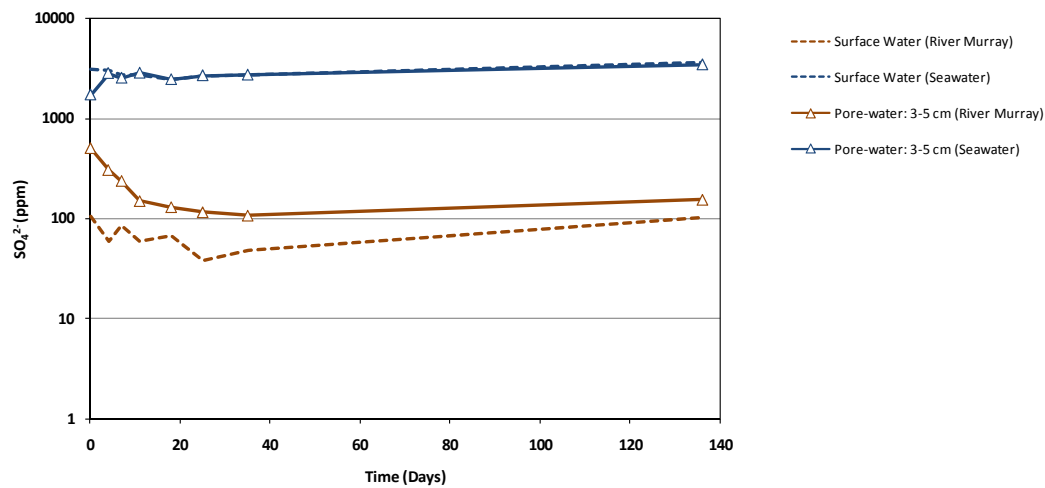


Figure 5-40. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 2.

### 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 seiche) 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup> concentrations were under the ANZECC trigger value (Figure 5-44).

- $\text{NH}_3$  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  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the uppermost pore-waters during inundation with River Murray water (Figure 5-51), but also an appreciable increase in  $\text{SO}_4$  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.

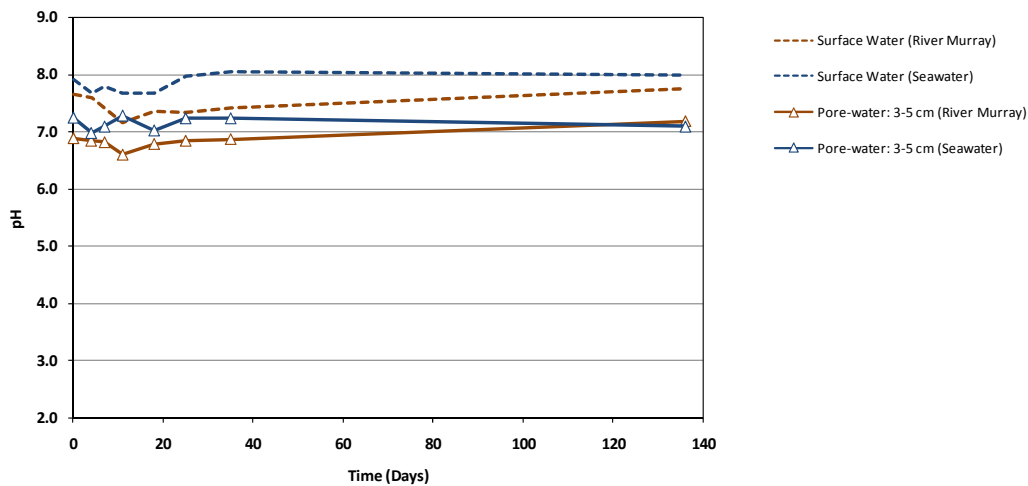


Figure 5-41. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

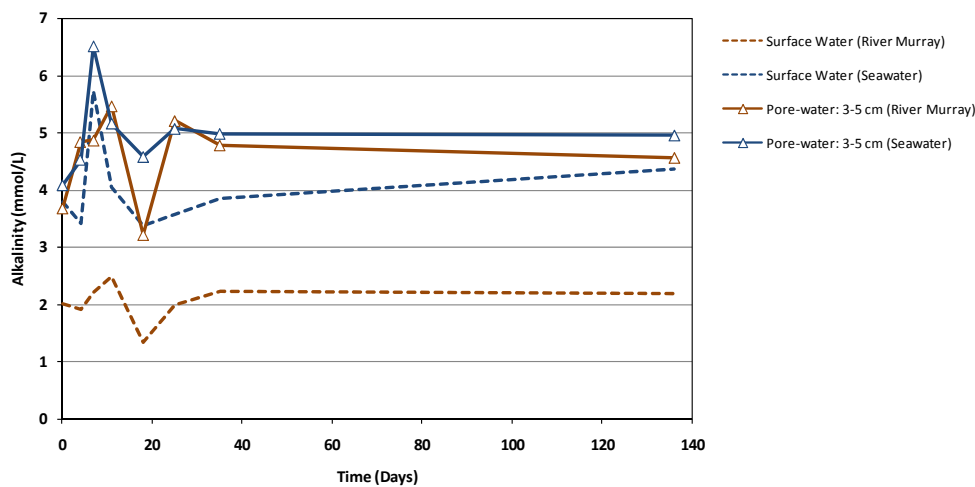


Figure 5-42. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

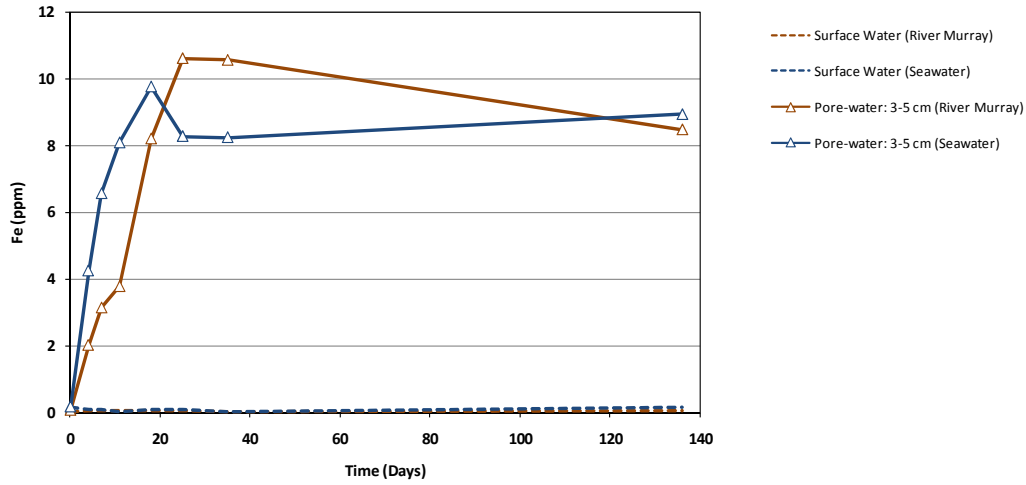


Figure 5-43. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.

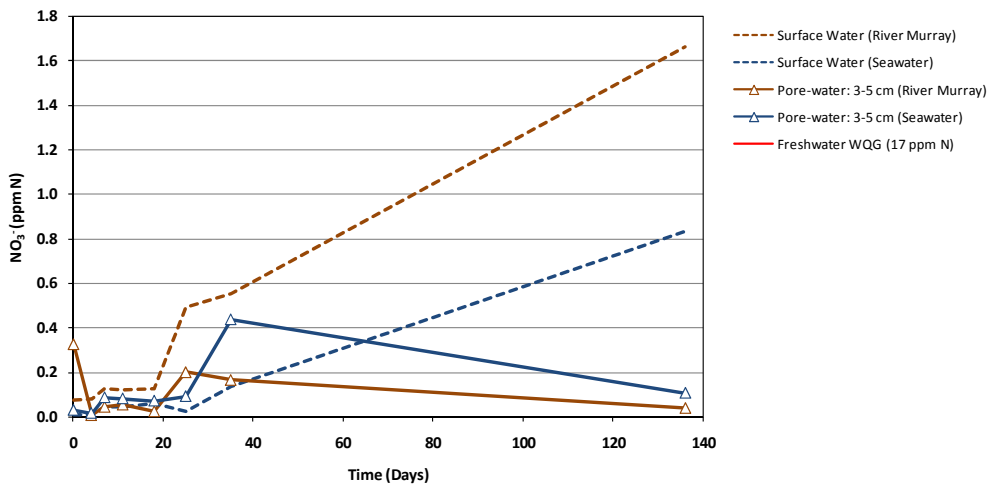


Figure 5-44. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. all values below the freshwater WQG trigger value).

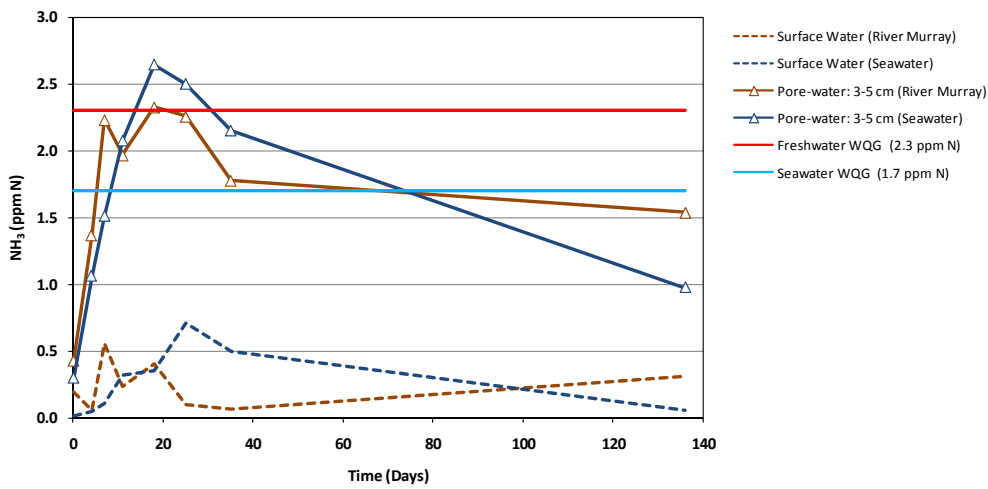


Figure 5-45. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3

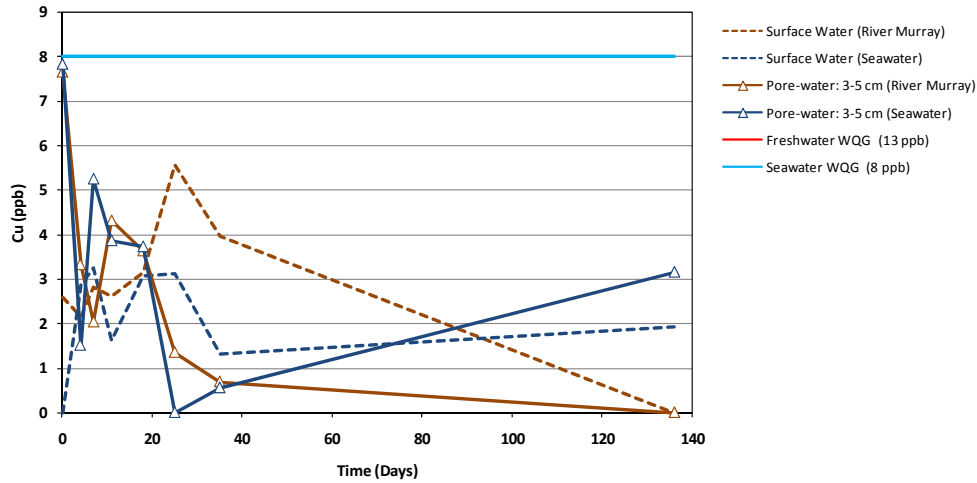


Figure 5-46. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

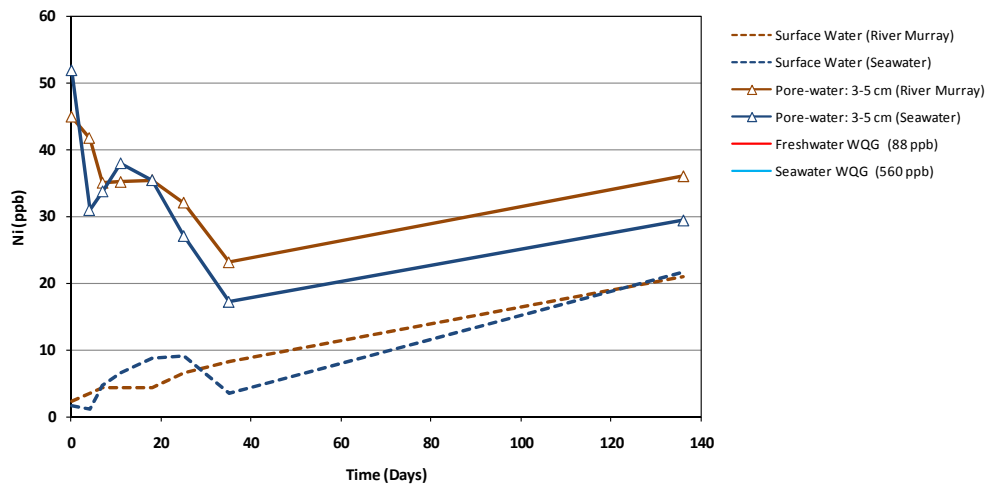


Figure 5-47. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

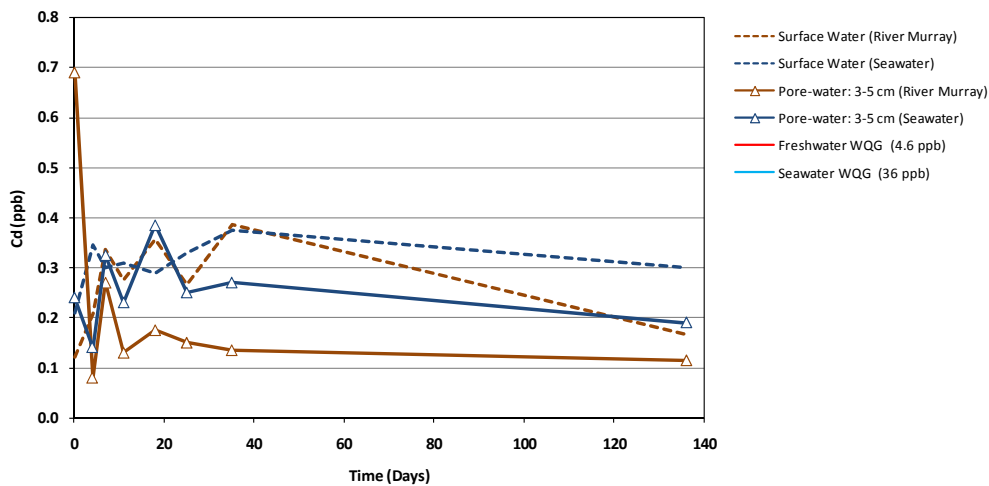


Figure 5-48. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

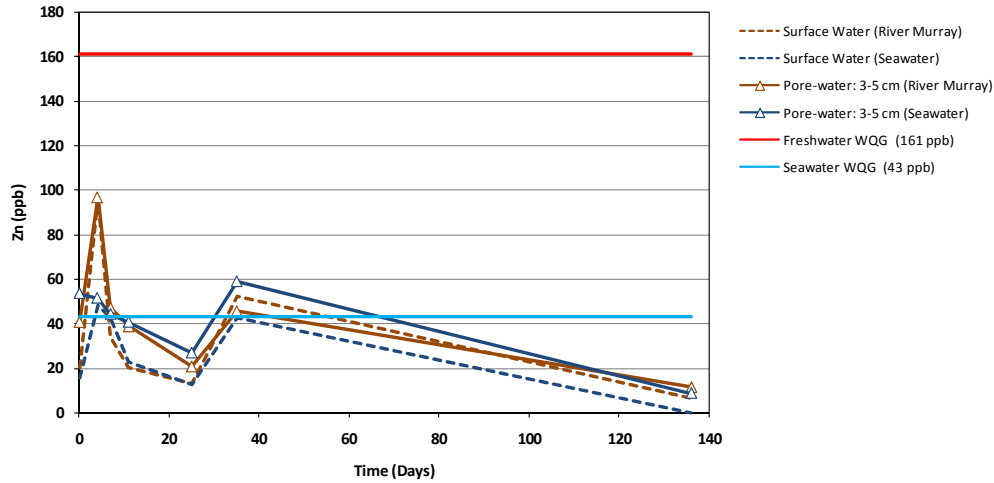


Figure 5-49. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted).

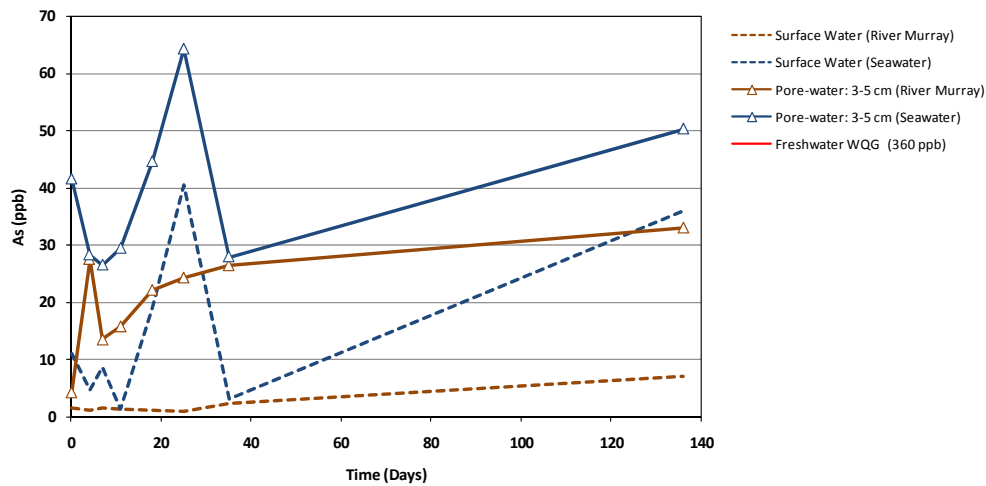


Figure 5-50. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

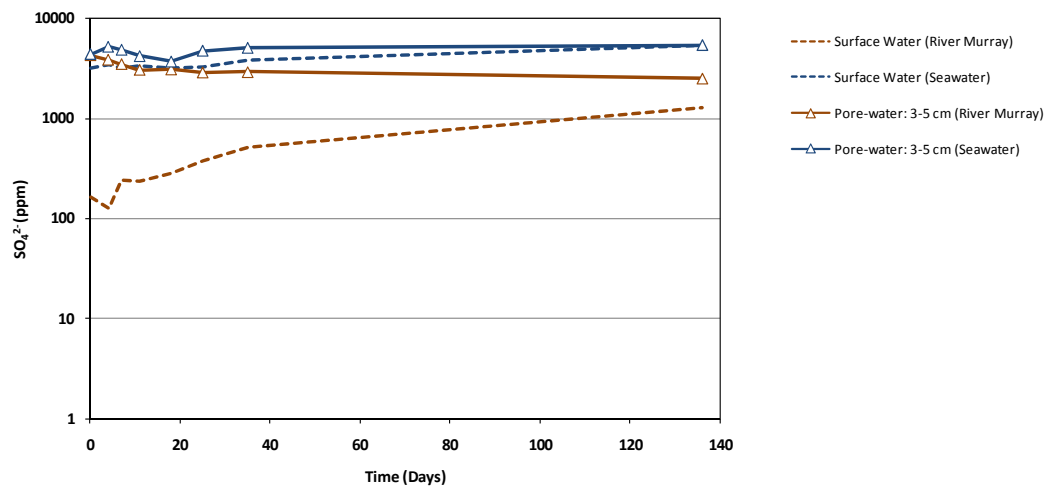


Figure 5-51. Sulfate ( $SO_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 3.



#### ***5.3.3.3 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<sub>3</sub>, 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.

#### ***5.3.3.4 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> concentrations increased considerably during the inundation period. For the River Murray inundating waters (where appropriate Water Quality Guidelines exist) the NO<sub>3</sub><sup>-</sup> concentrations were below the ANZECC trigger value (Figure 5-55).

- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The  $\text{NH}_3$  concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-56). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  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.

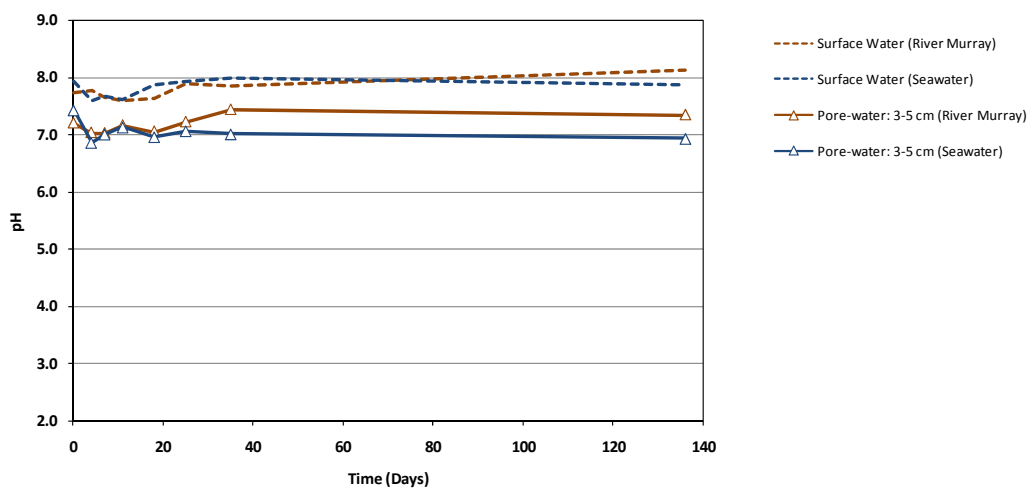


Figure 5-52. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

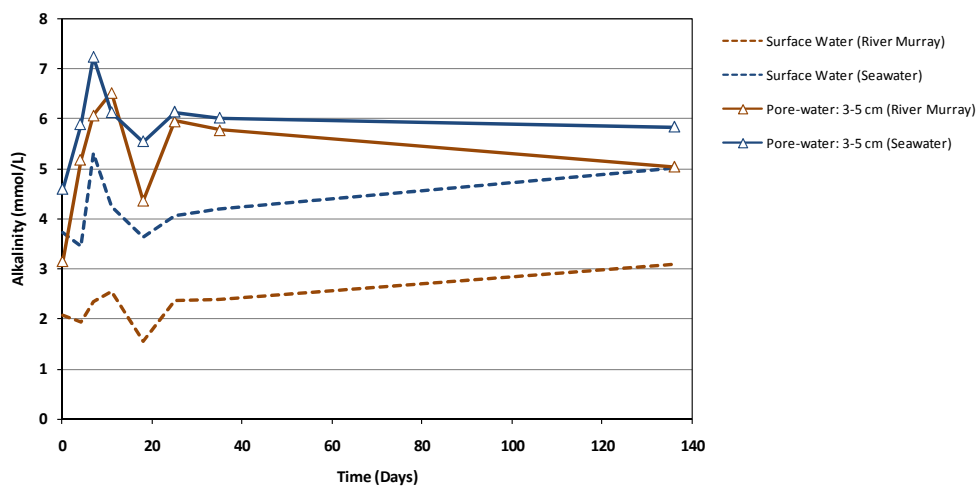


Figure 5-53. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

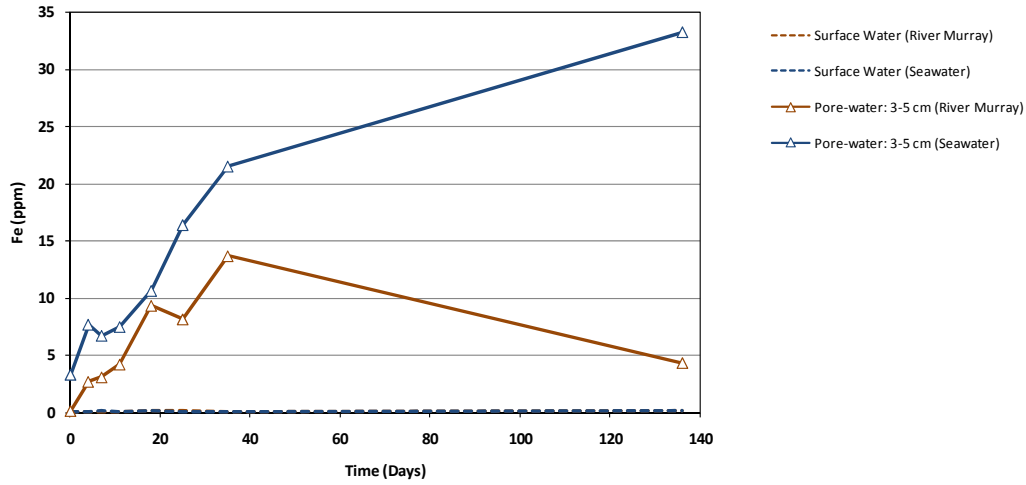


Figure 5-54. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

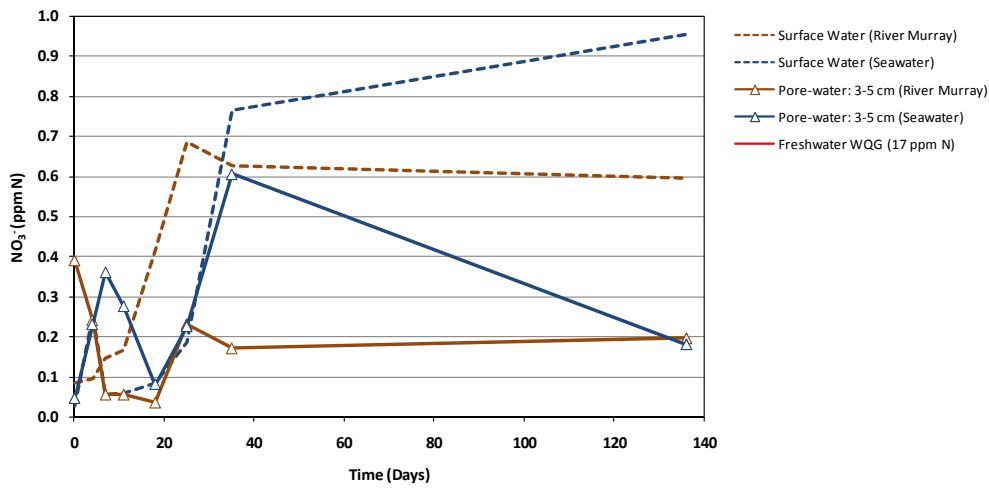


Figure 5-55. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. all values below the freshwater WQG trigger value).

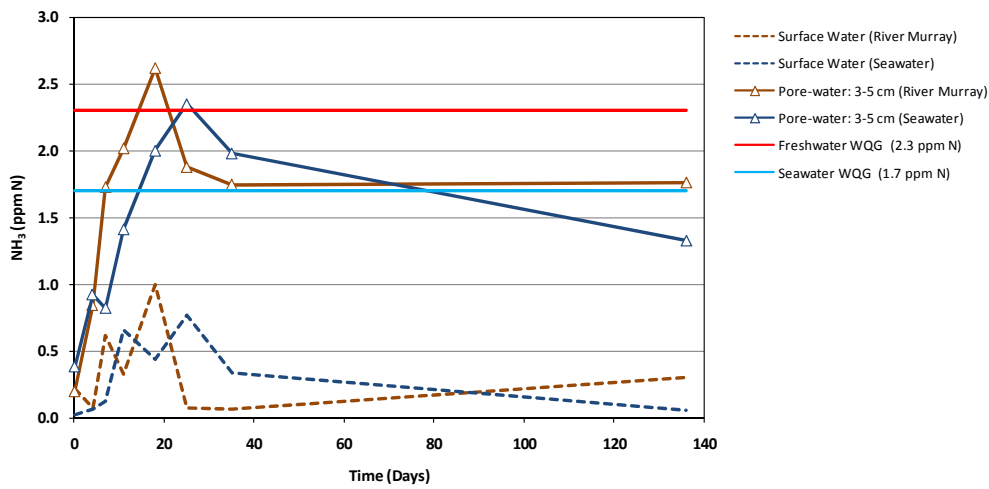


Figure 5-56. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

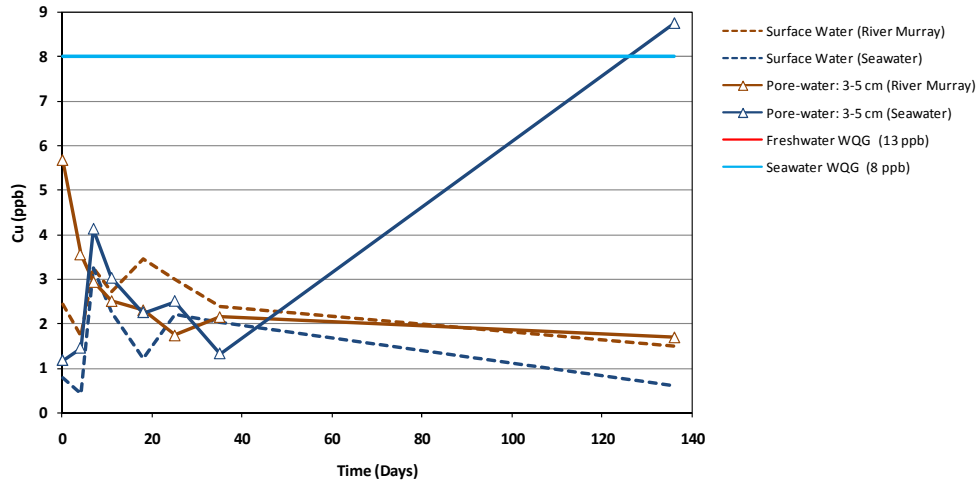


Figure 5-57. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

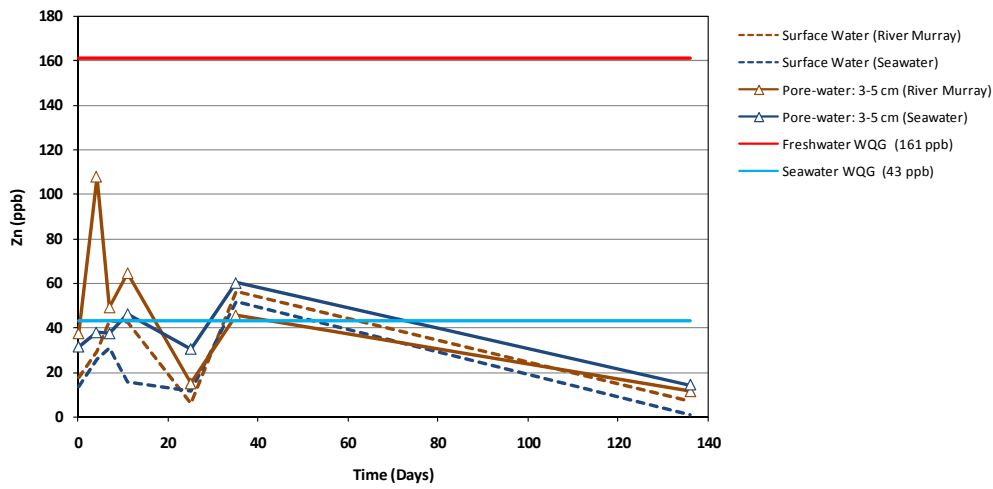


Figure 5-58. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4 (n.b. data below the laboratory LOD plotted).

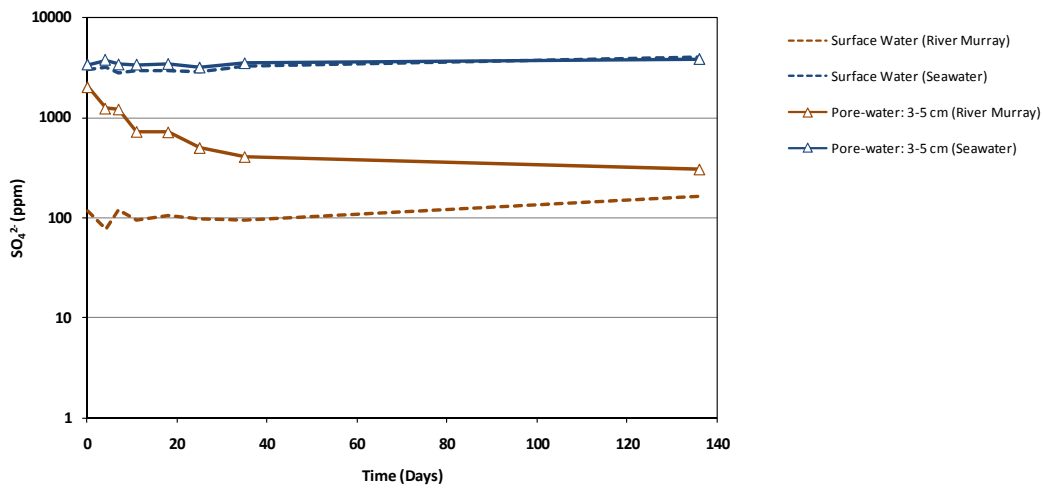


Figure 5-59. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 4.

#### ***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 seiche) 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<sub>3</sub>, 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup>

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

- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The  $\text{NH}_3$  concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-64). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-70).

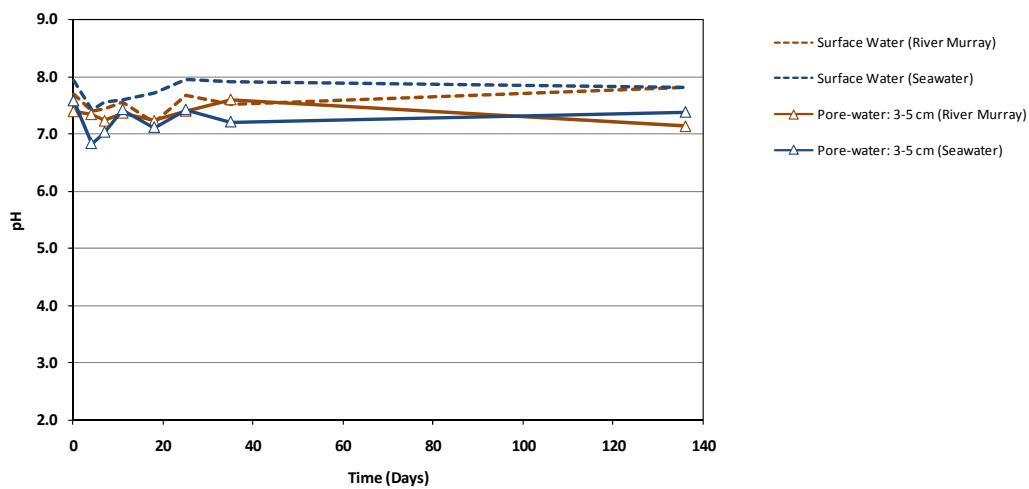


Figure 5-60. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

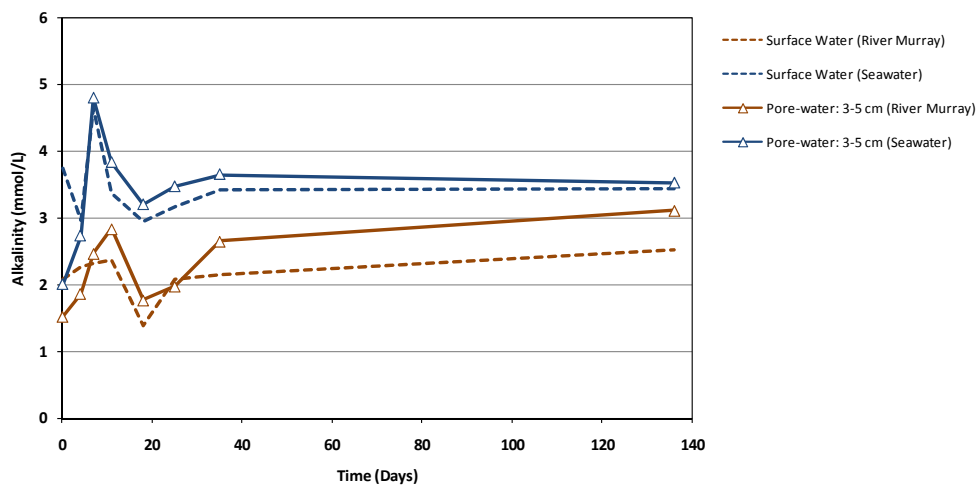


Figure 5-61. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.



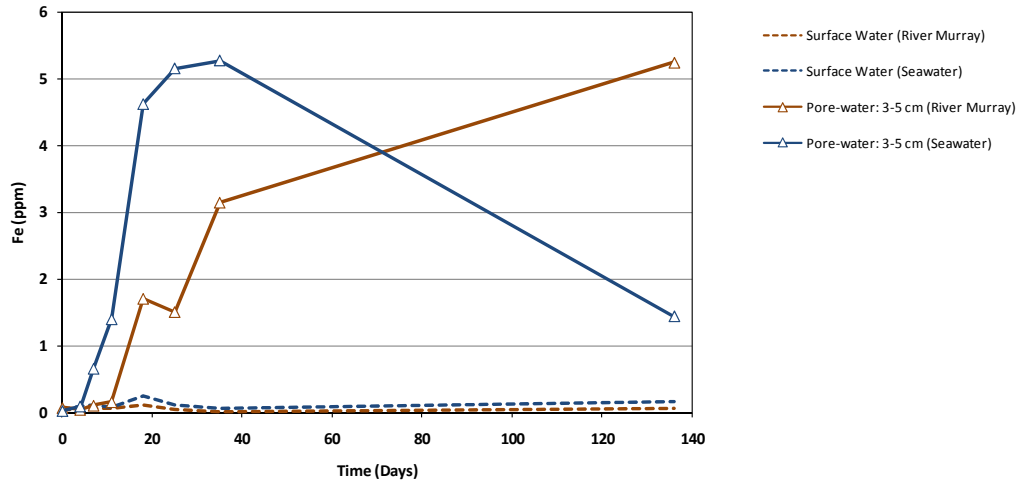


Figure 5-62. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

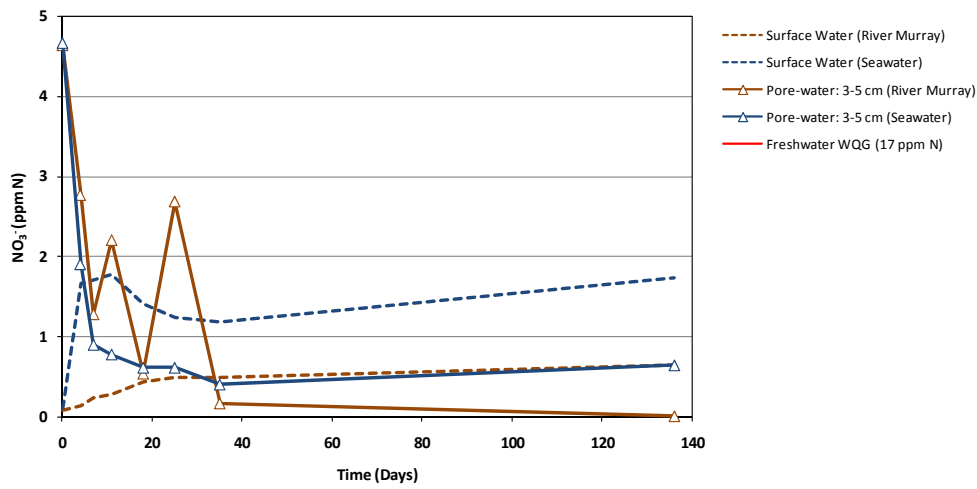


Figure 5-63. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. all values below the freshwater WQG trigger value).

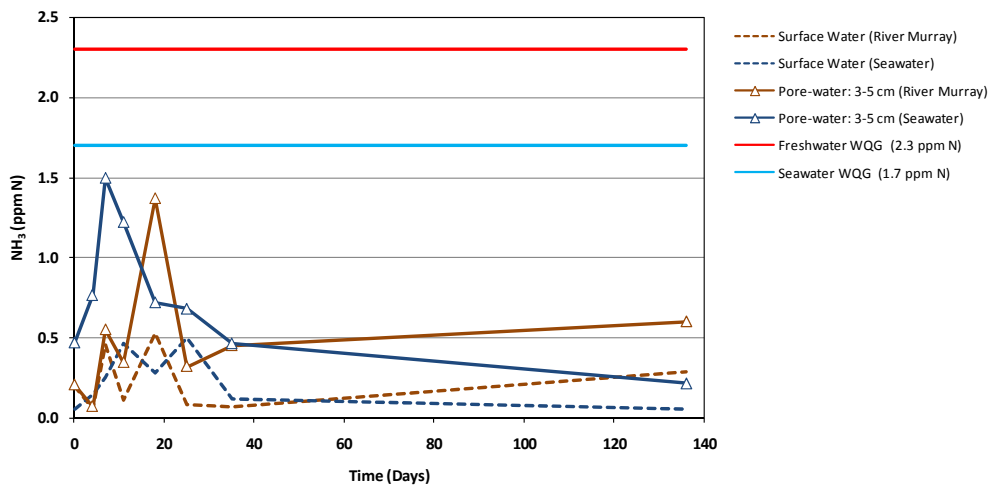


Figure 5-64. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

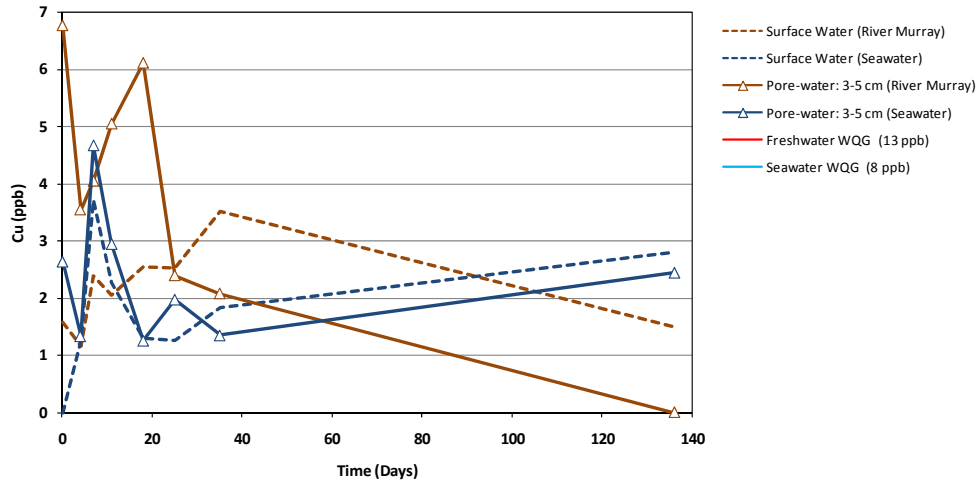


Figure 5-65. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

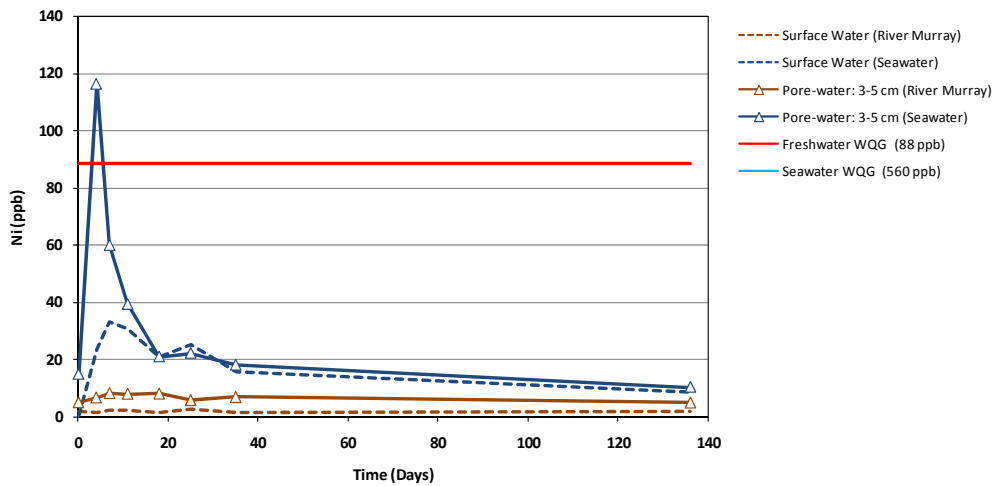


Figure 5-66. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

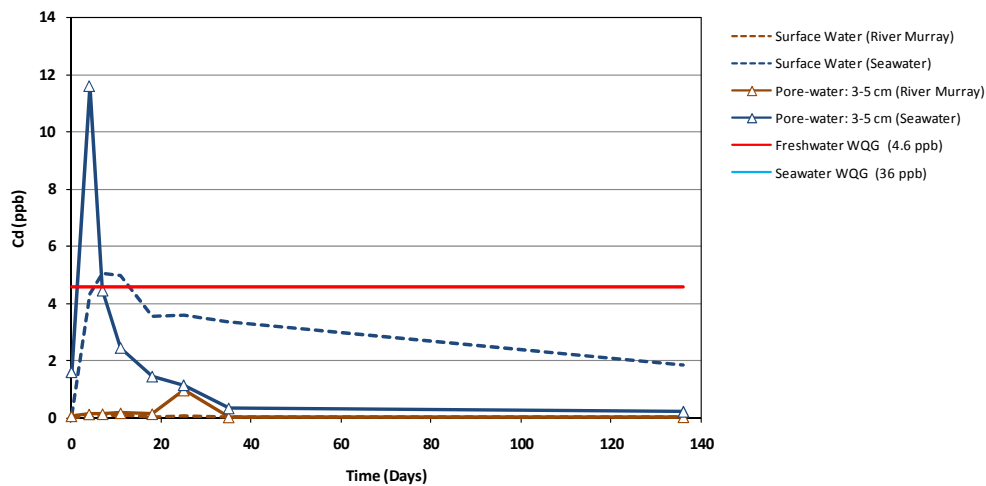


Figure 5-67. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

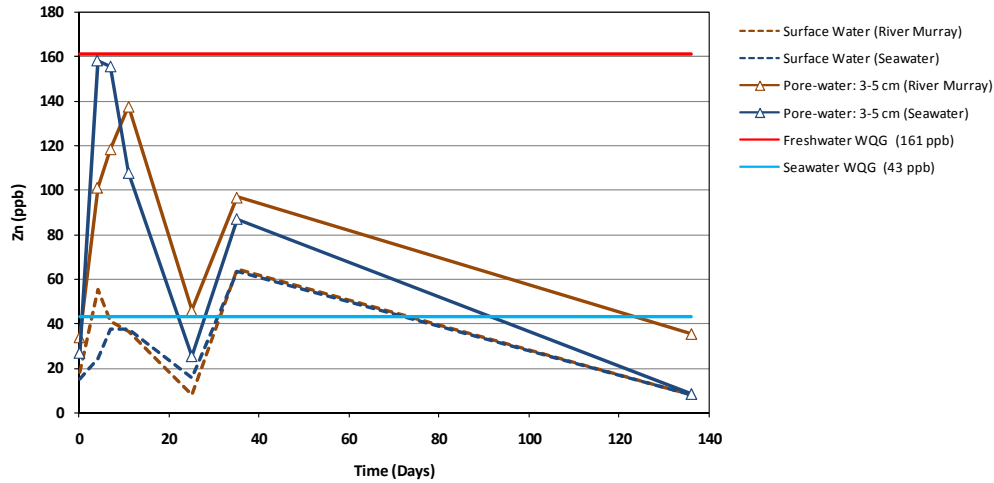


Figure 5-68. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

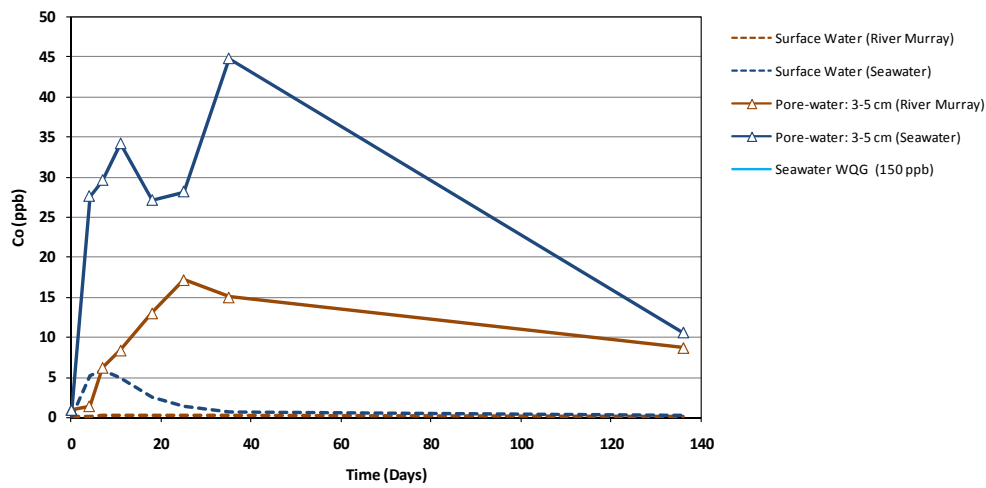


Figure 5-69. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

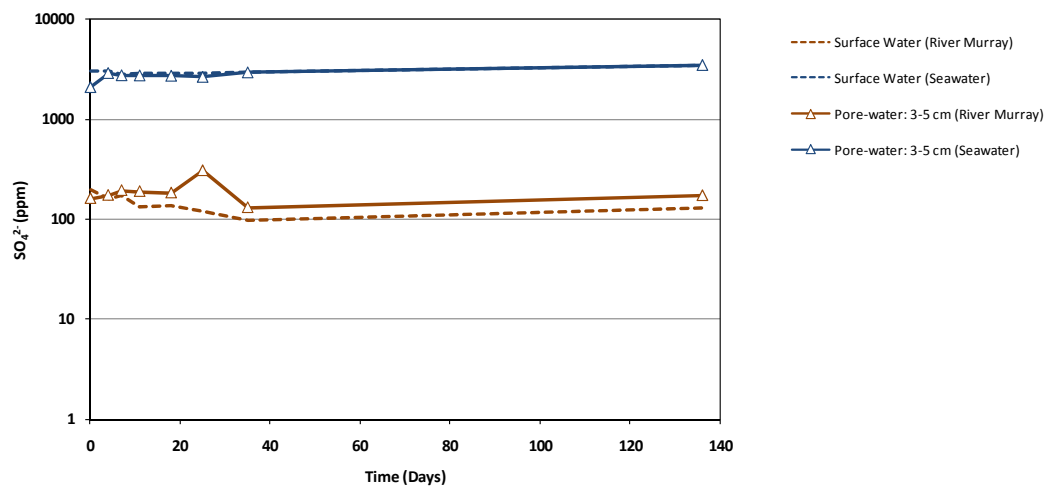


Figure 5-70. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 5.

#### ***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<sup>+</sup>/tonne) as would be expected given the neutral/alkaline pH of these soil materials. However, the TAA was also < 3.0 mmol H<sup>+</sup>/ 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 increase 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 mobilisation 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).
- $\text{NH}_3$  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  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  in the inundating waters was via upwards diffusion. The mobilisation of  $\text{NH}_3$  was more pronounced when seawater was the inundating water.
- $\text{NO}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-80).

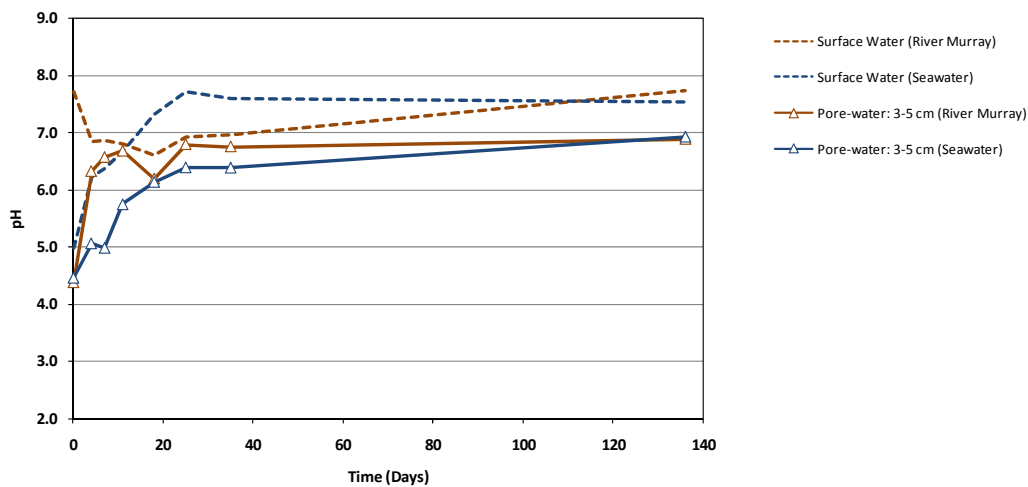


Figure 5-71. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

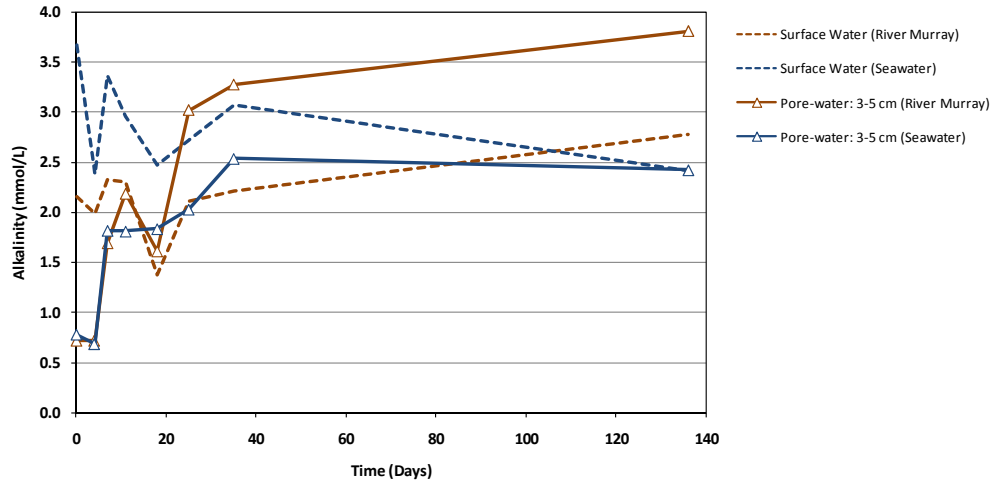


Figure 5-72. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

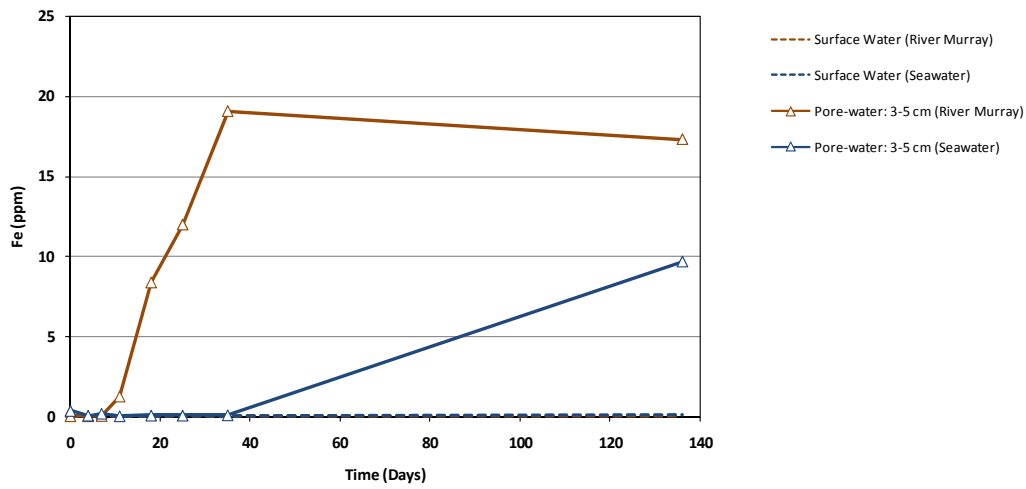


Figure 5-73. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

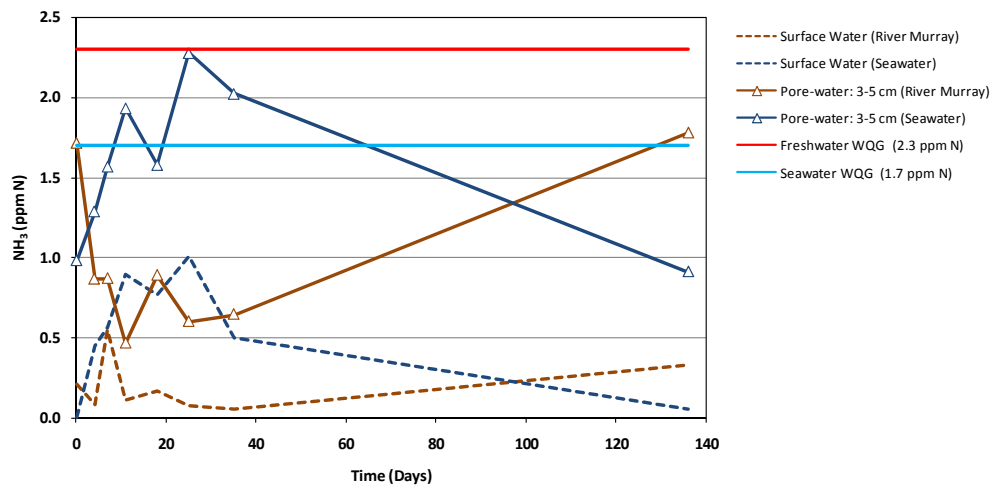


Figure 5-74. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

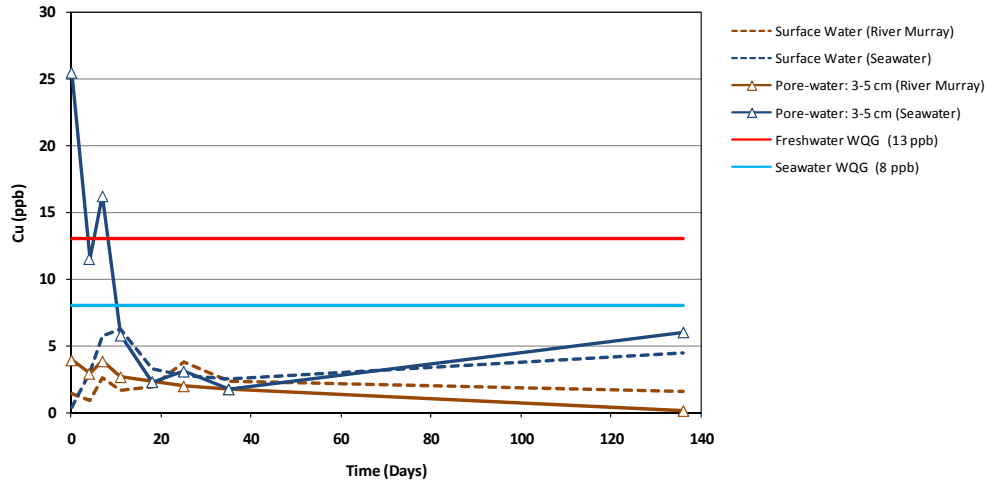


Figure 5-75. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

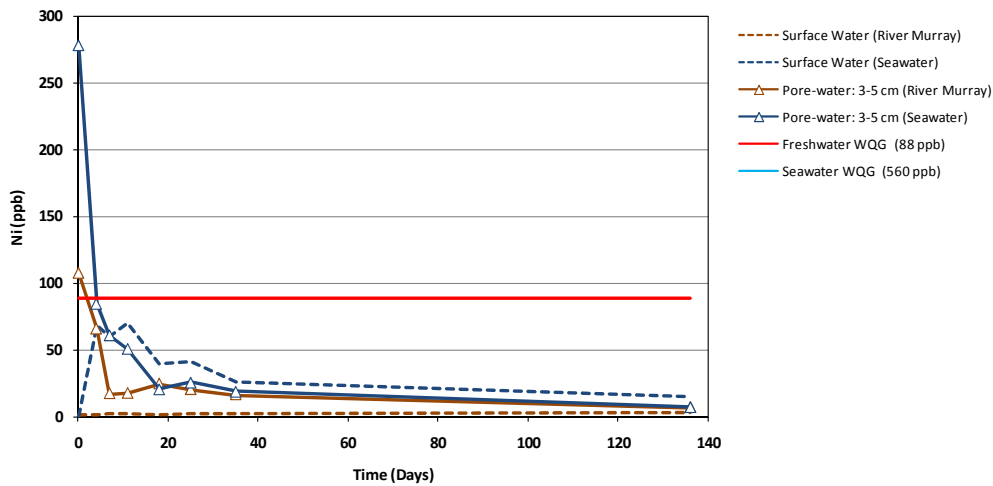


Figure 5-76. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

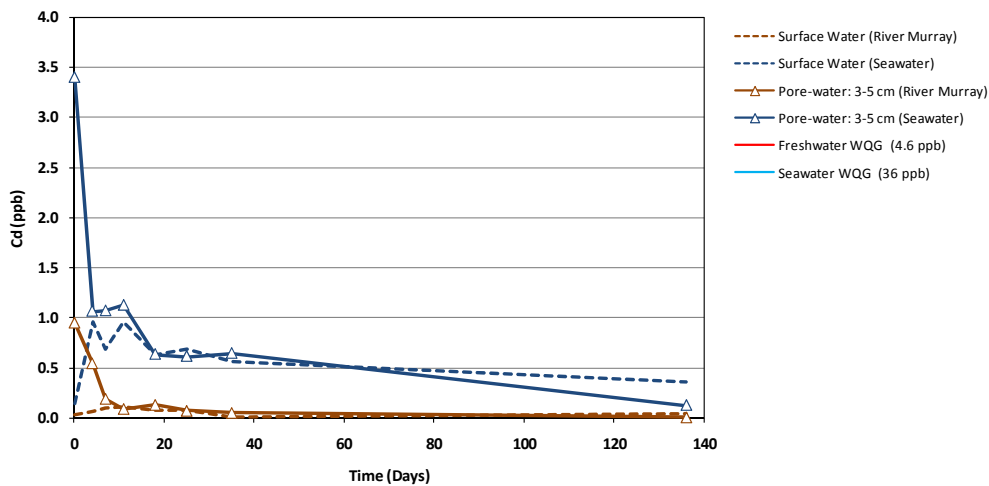


Figure 5-77. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).



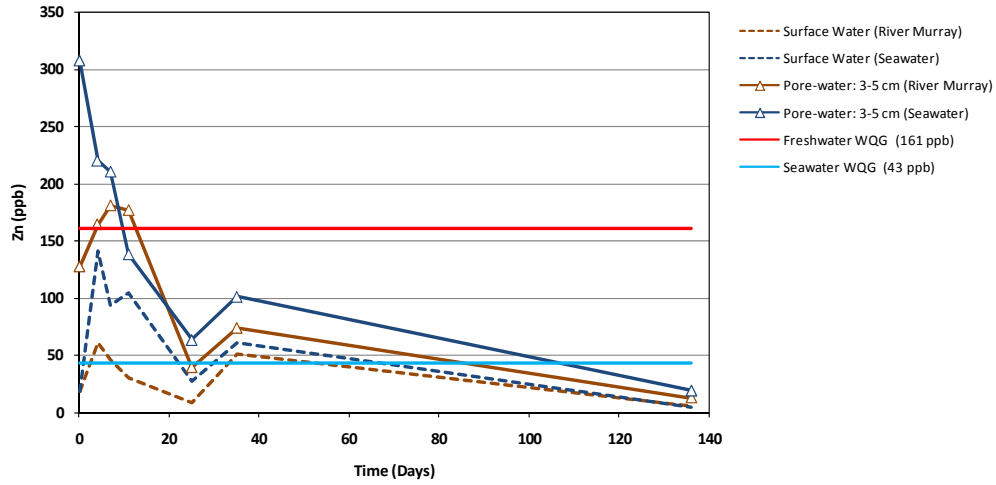


Figure 5-78. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

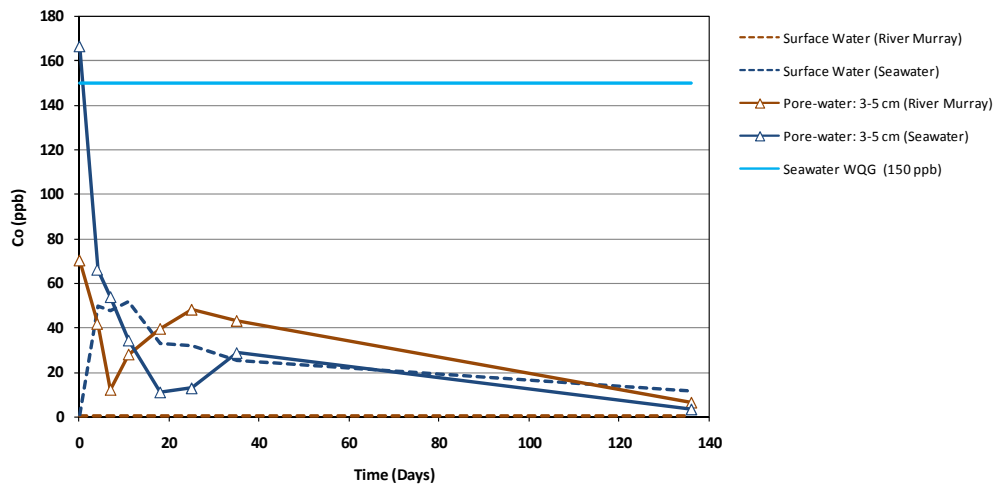


Figure 5-79. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6 (n.b. data below the laboratory LOD plotted).

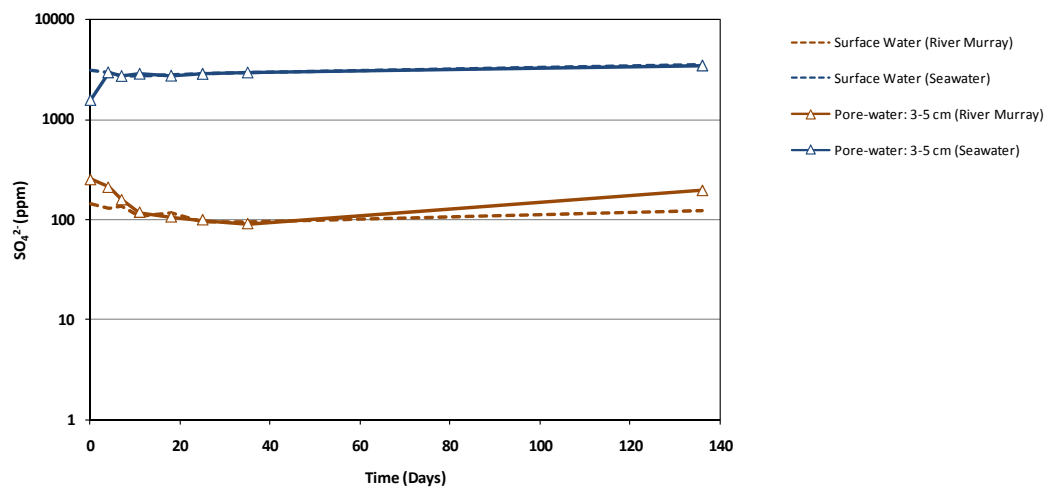


Figure 5-80. Sulfate ( $SO_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 6.

#### **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 seiche) 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<sub>3</sub>, 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<sub>3</sub> 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<sup>+</sup>/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<sub>3</sub> 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<sub>3</sub> in the pore-waters suggest that the increase of NH<sub>3</sub> 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<sub>4</sub> in the pore-waters during inundation with River Murray water (Figure 5-89).

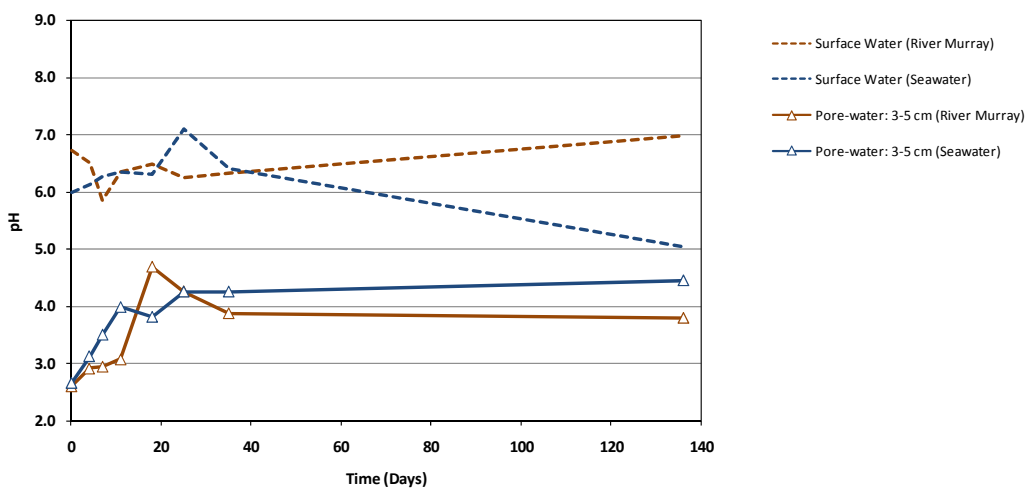


Figure 5-81. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

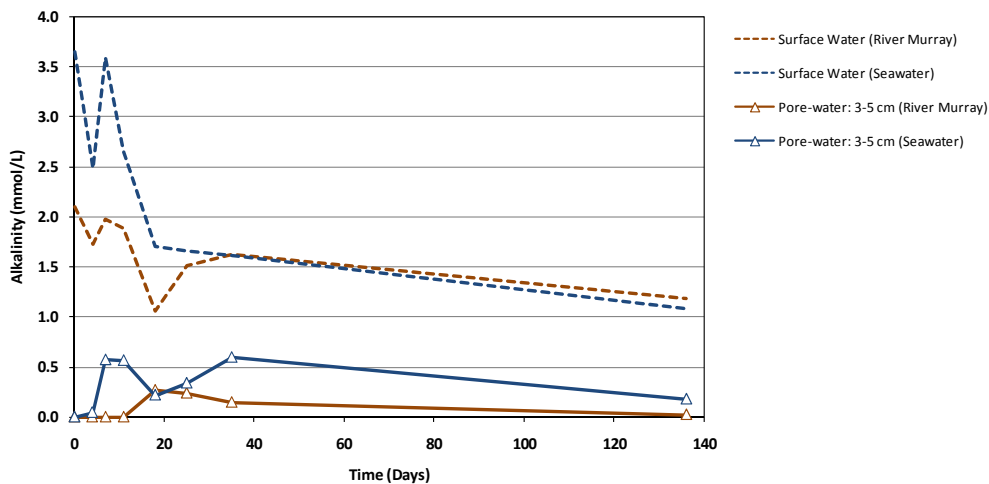


Figure 5-82. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

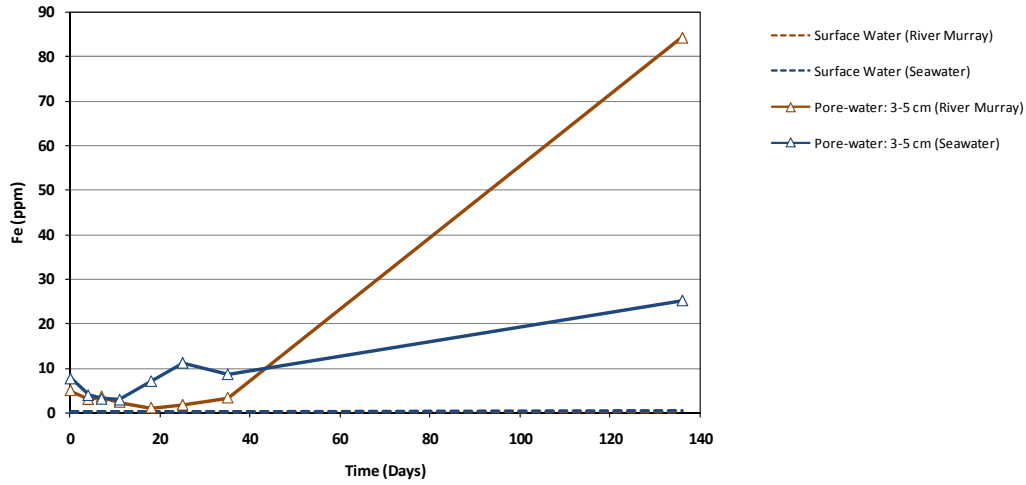


Figure 5-83. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

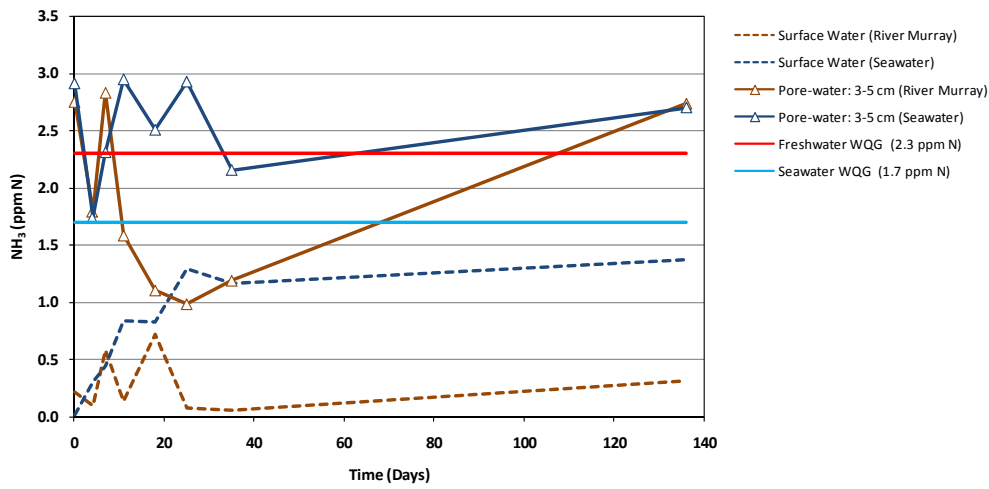


Figure 5-84. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

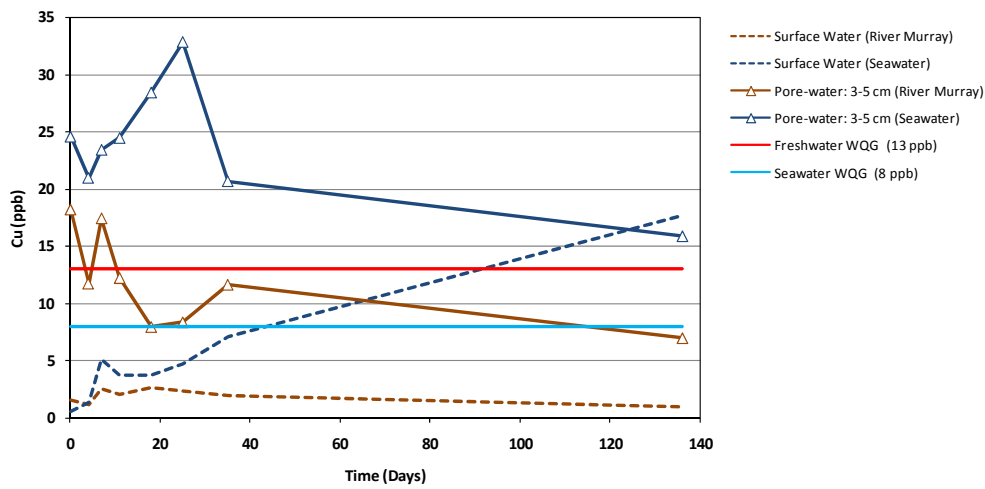


Figure 5-85. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted).

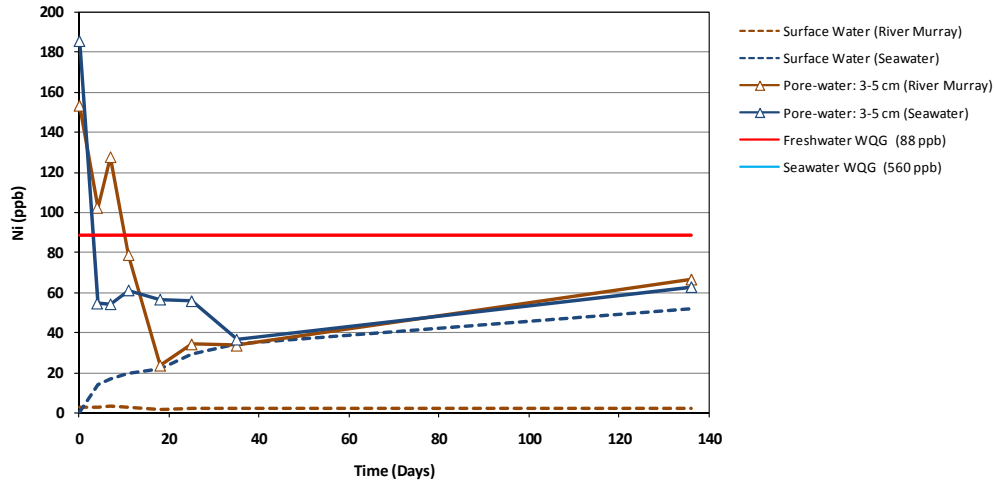


Figure 5-86. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

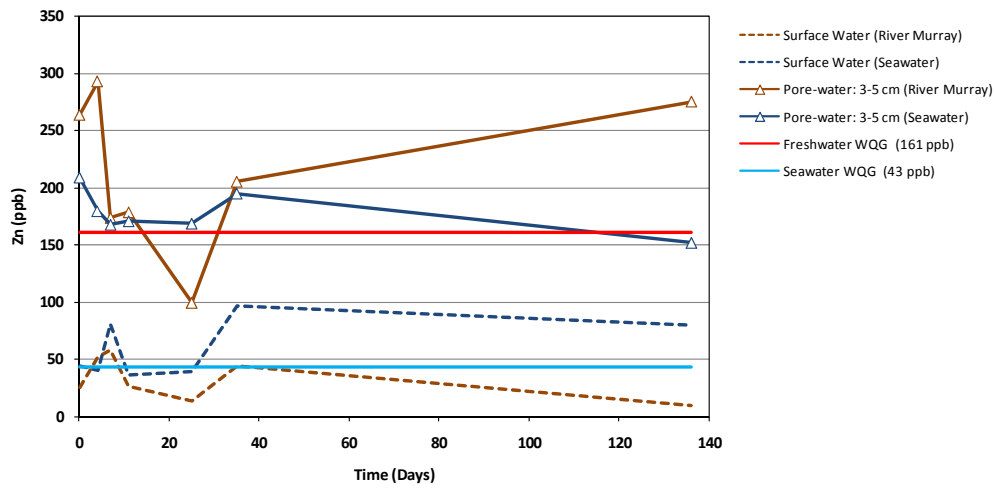


Figure 5-87. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

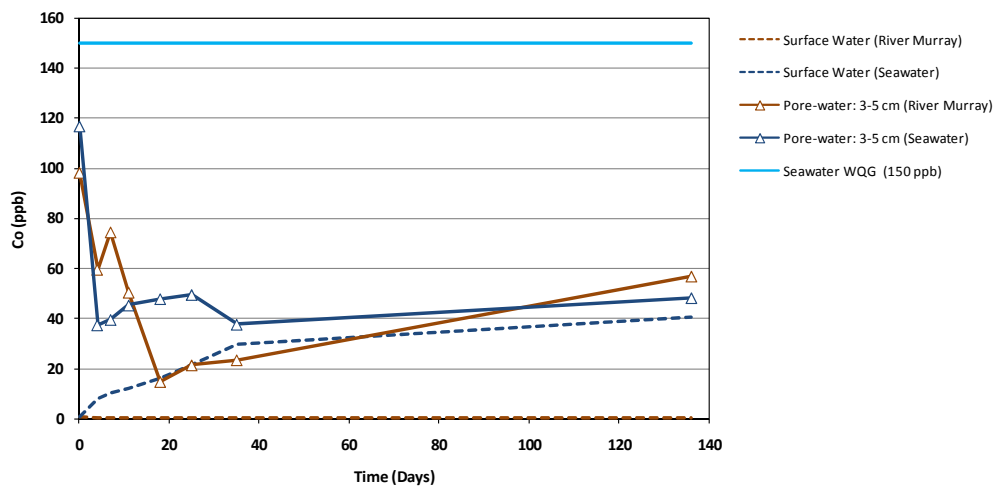


Figure 5-88. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7 (n.b. data below the laboratory LOD plotted).

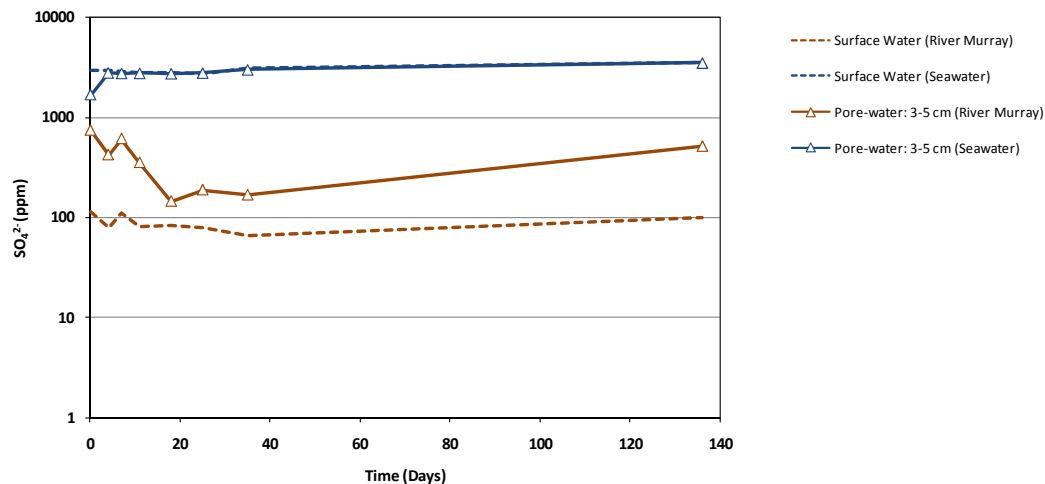


Figure 5-89. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 7.

#### 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 seiche) 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,  $\text{NH}_3$  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<sup>+</sup>/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).
- $\text{NO}_3^-$  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).
- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 136 days for the seawater, respectively). The  $\text{NH}_3$  concentrations just exceeded the appropriate ANZECC trigger value for seawater at days 11 to 35 only (Figure 5-94). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the surface soil layer pore-waters during inundation with River Murray water (Figure 5-100).

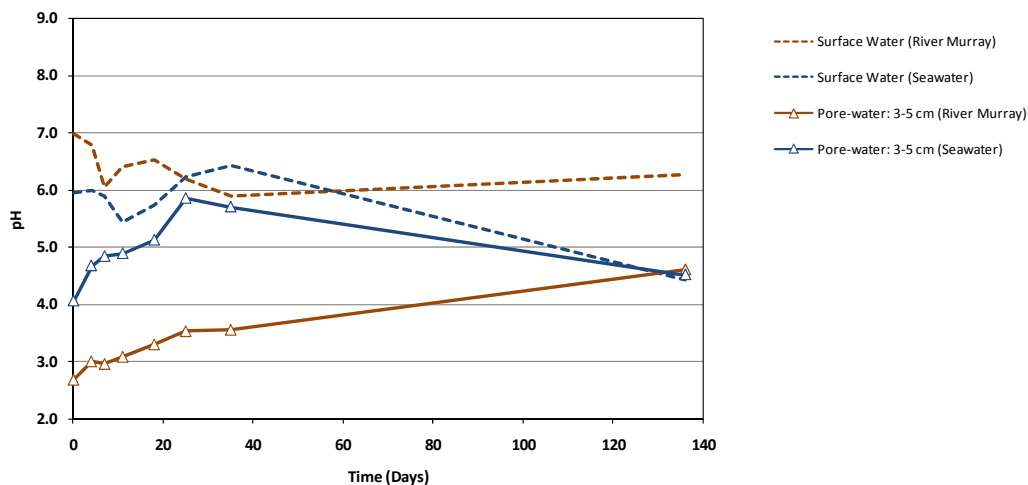


Figure 5-90. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

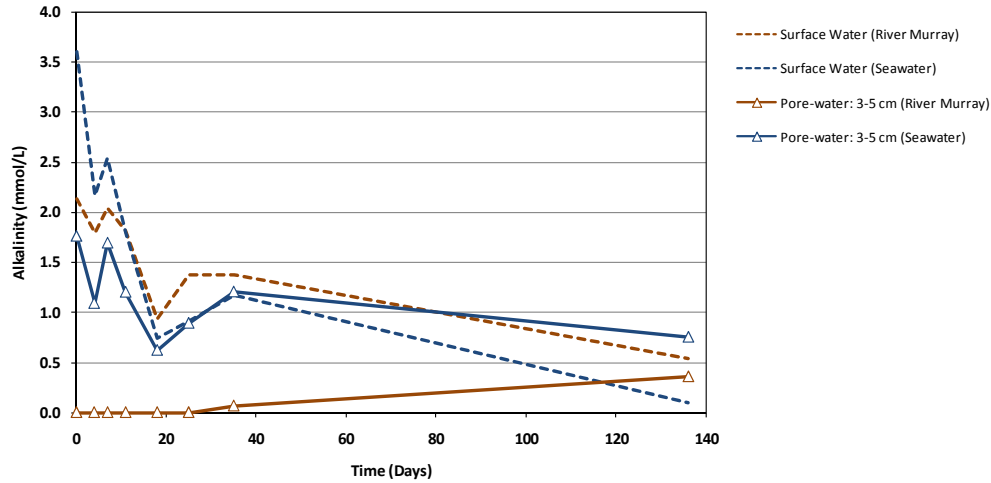


Figure 5-91. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

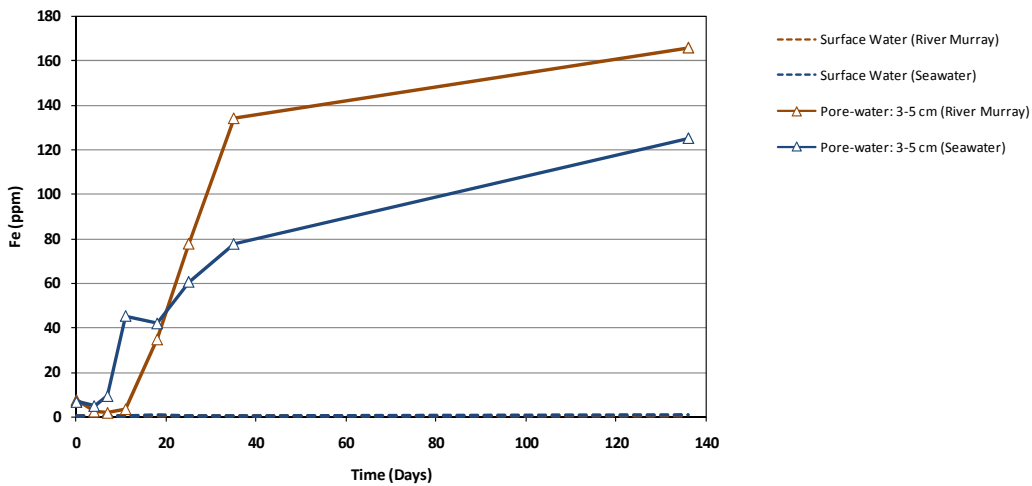


Figure 5-92. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

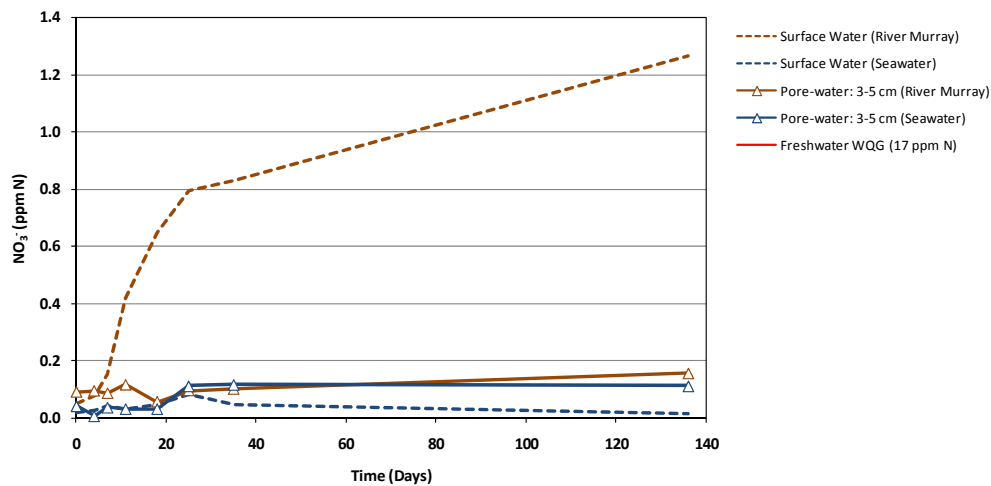


Figure 5-93. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. all values below the freshwater WQG trigger value).

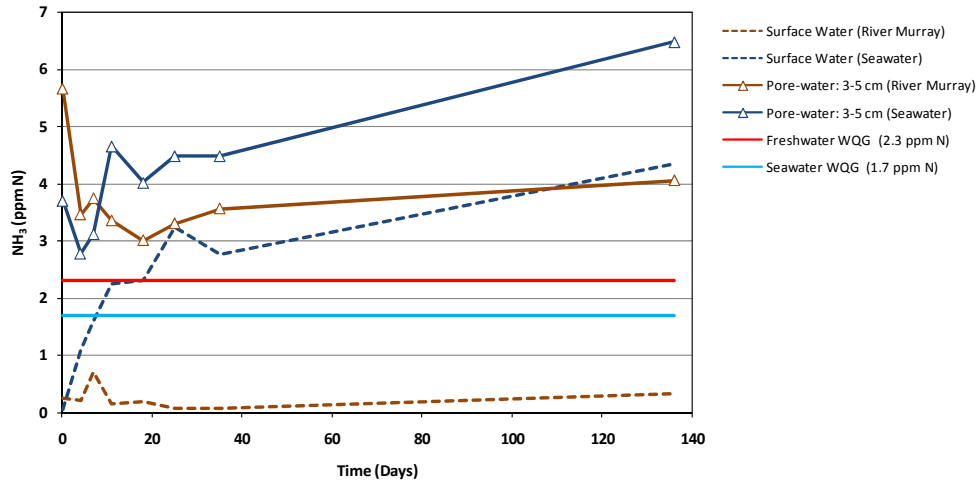


Figure 5-94. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

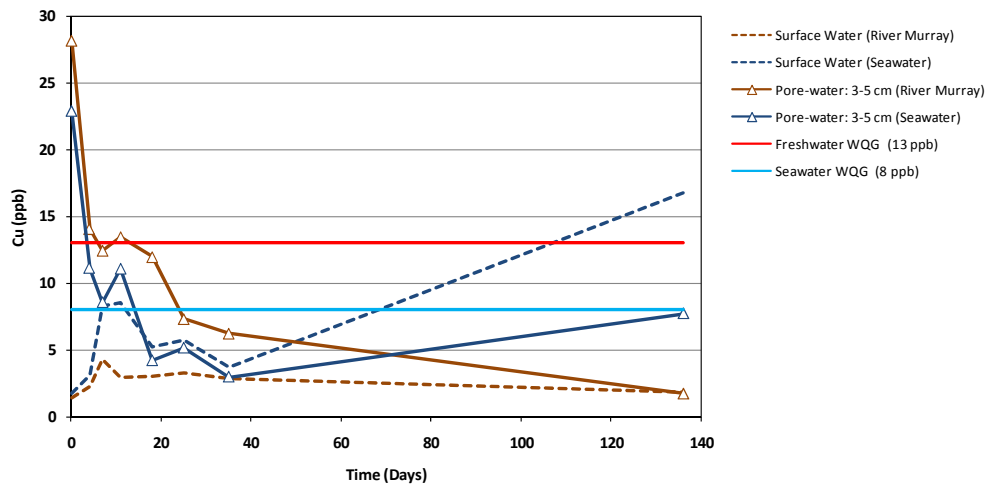


Figure 5-95. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted).

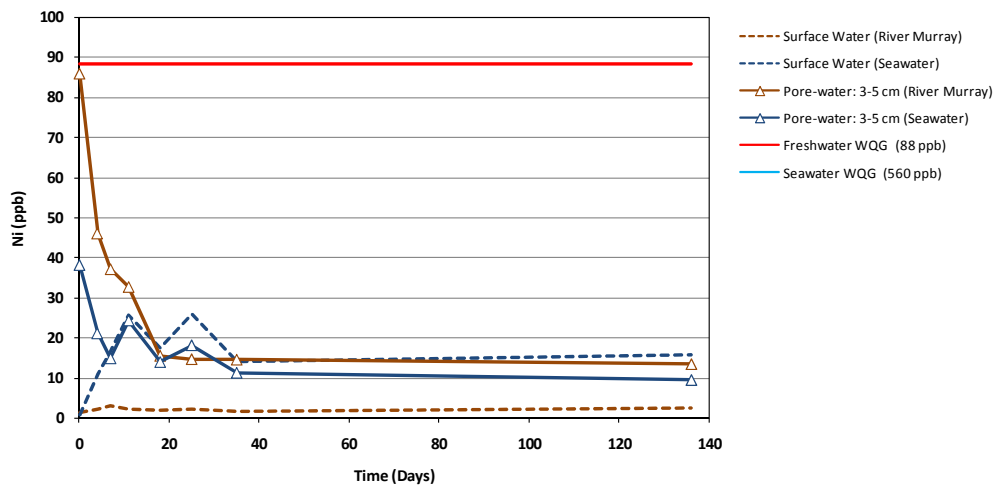


Figure 5-96. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

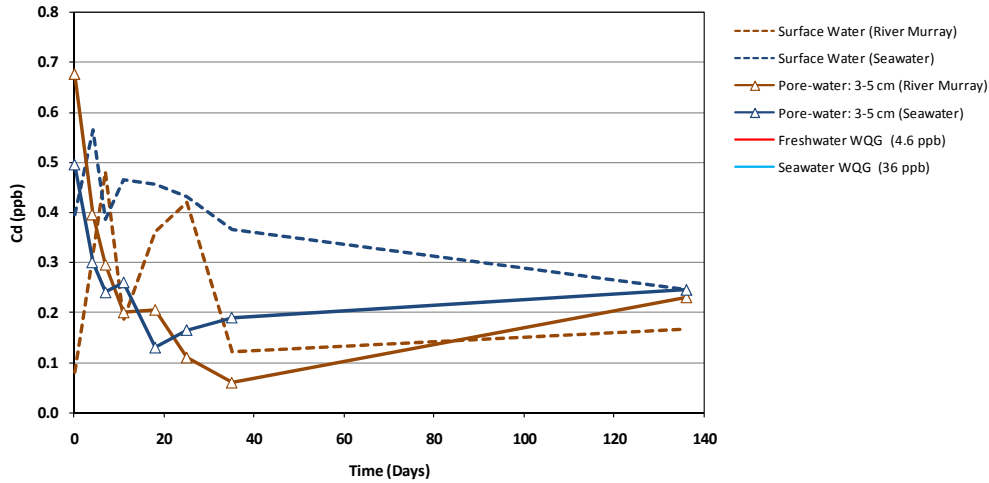


Figure 5-97. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

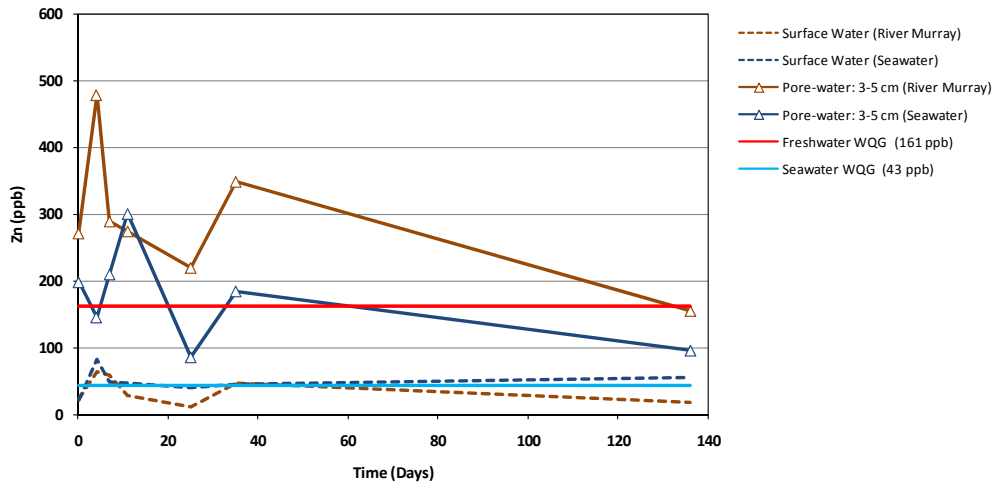


Figure 5-98. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

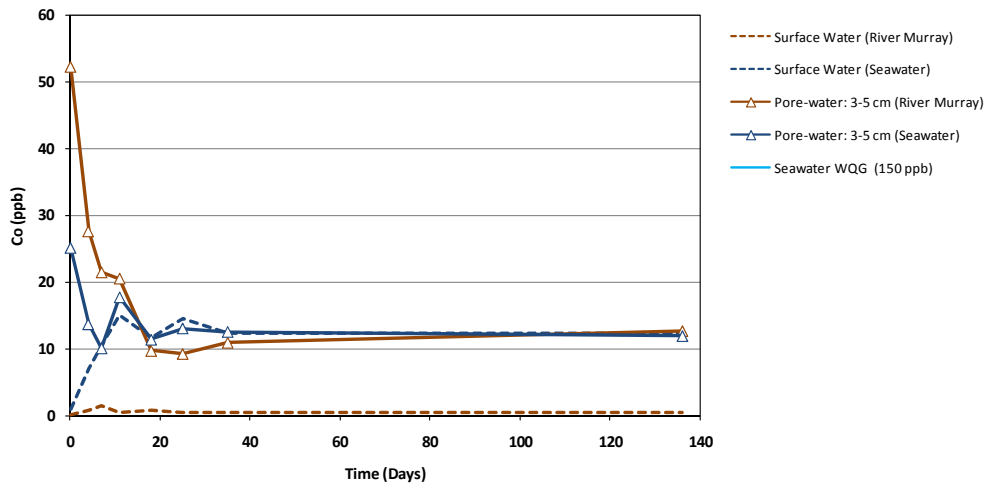


Figure 5-99. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

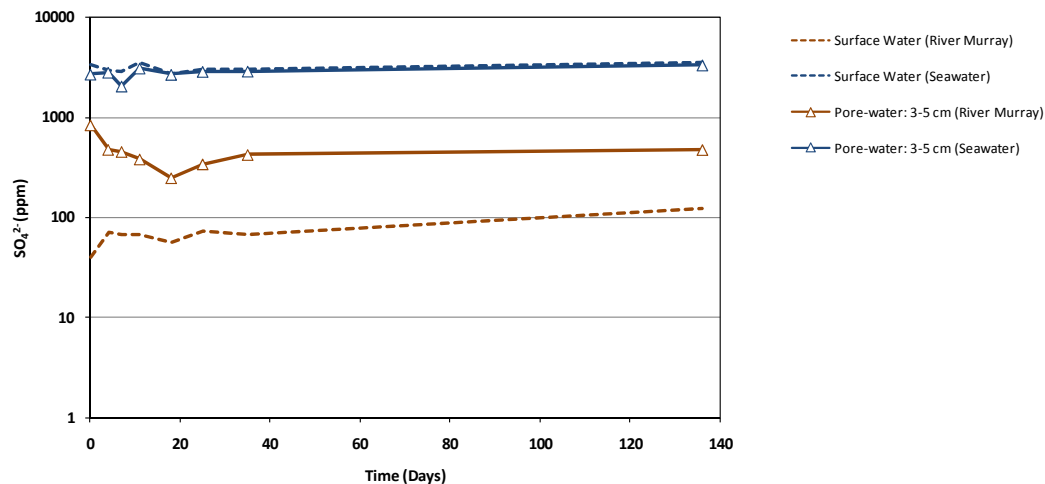


Figure 5-100. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 8.

### 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  $\text{NH}_3$ , Cu and Zn, and the diminishing alkalinities in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiche) 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,  $\text{NH}_3$ , 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,  $\text{NH}_3$ , and Cu into the inundating waters were stronger when seawater was used. Conversely, mobilisation  $\text{NO}_3^-$  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<sup>+</sup>/ 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).

- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 18 days for River Murray and 25 days for the seawater, respectively). The  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-107).

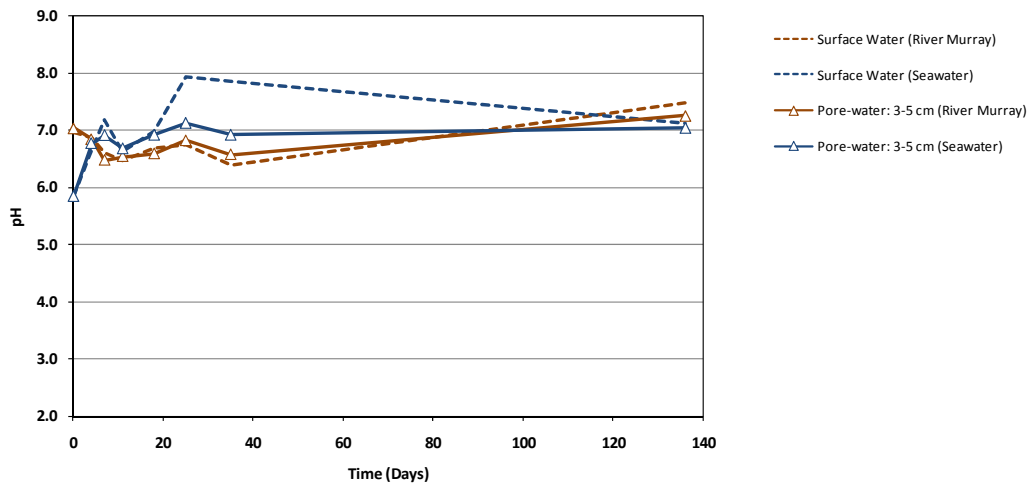


Figure 5-101. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

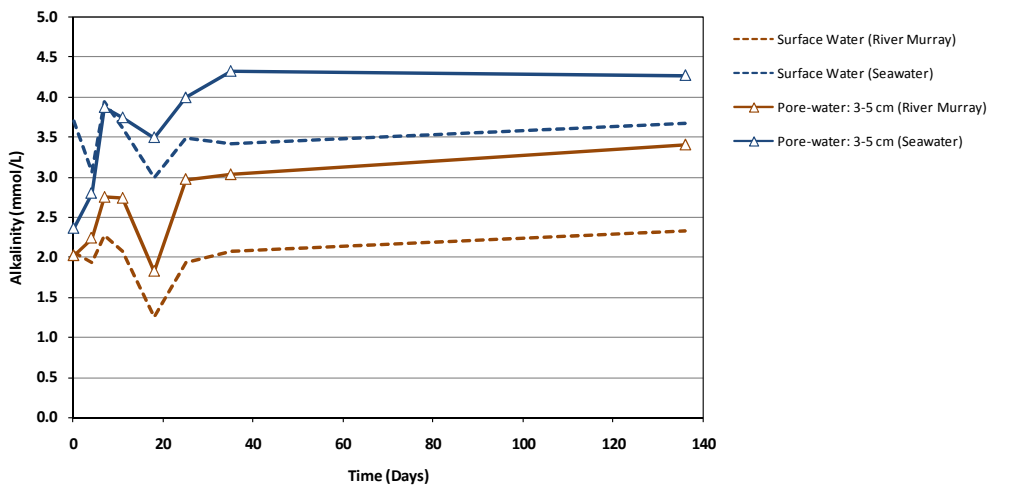


Figure 5-102. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

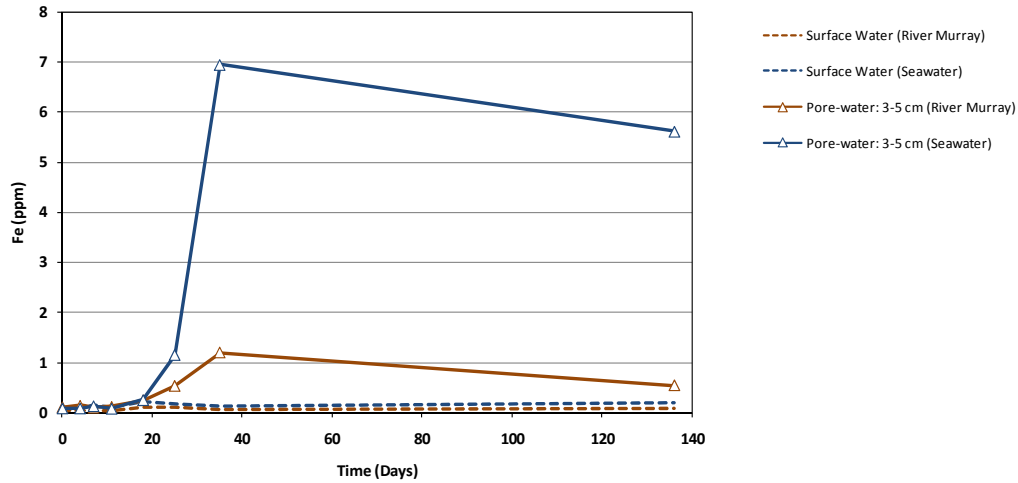


Figure 5-103. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

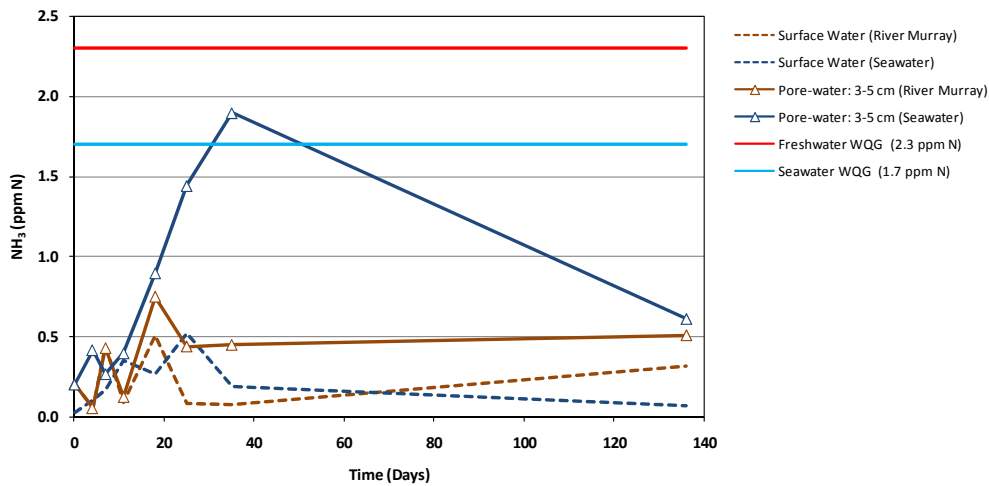


Figure 5-104. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

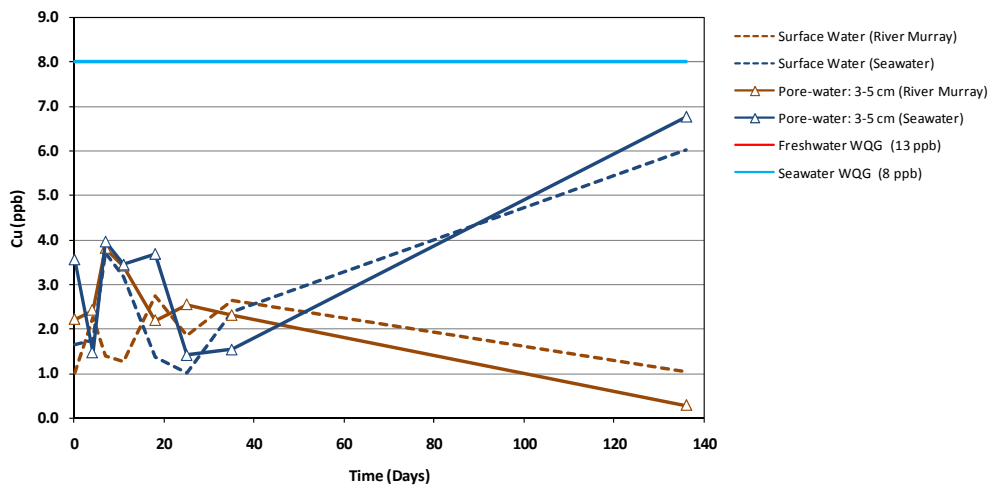


Figure 5-105. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).



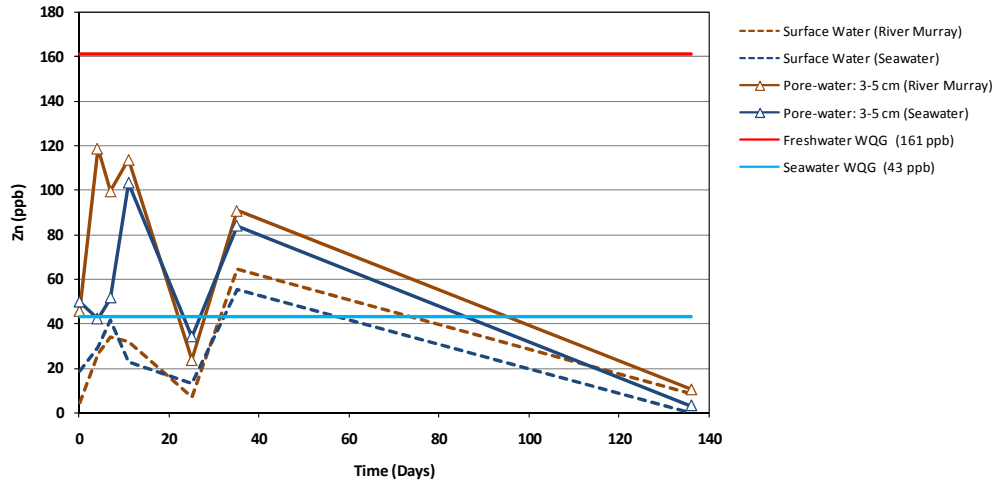


Figure 5-106. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9 (n.b. data below the laboratory LOD plotted).

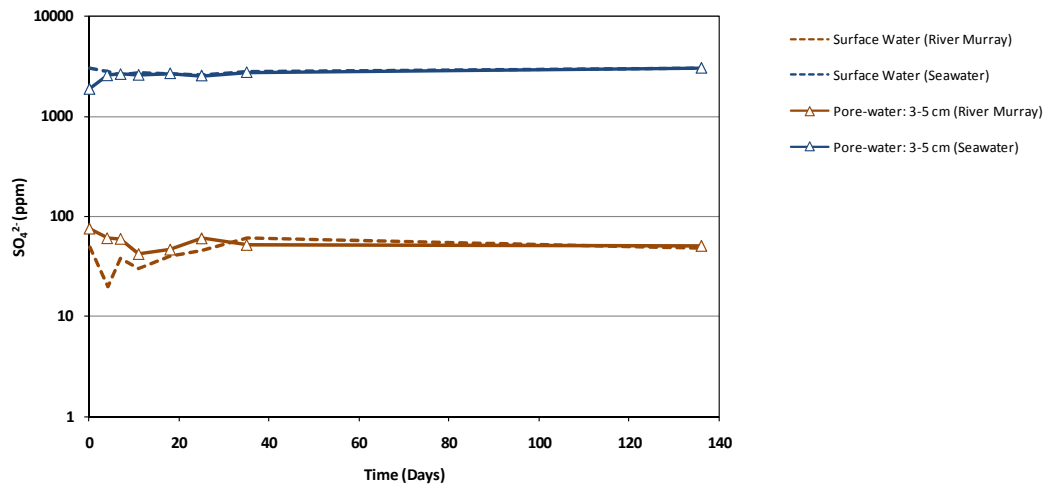


Figure 5-107. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 9.

### 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 seiche) 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  $\text{NH}_3$  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<sup>+</sup>/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).
- $\text{NO}_3^-$  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  $\text{NO}_3^-$  concentrations were below the ANZECC trigger value (Figure 5-111).
- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 11 days for the seawater, respectively). The  $\text{NH}_3$  concentrations exceeded the appropriate ANZECC trigger values for seawater at days 4 to 25 only (Figure 5-112). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-117).

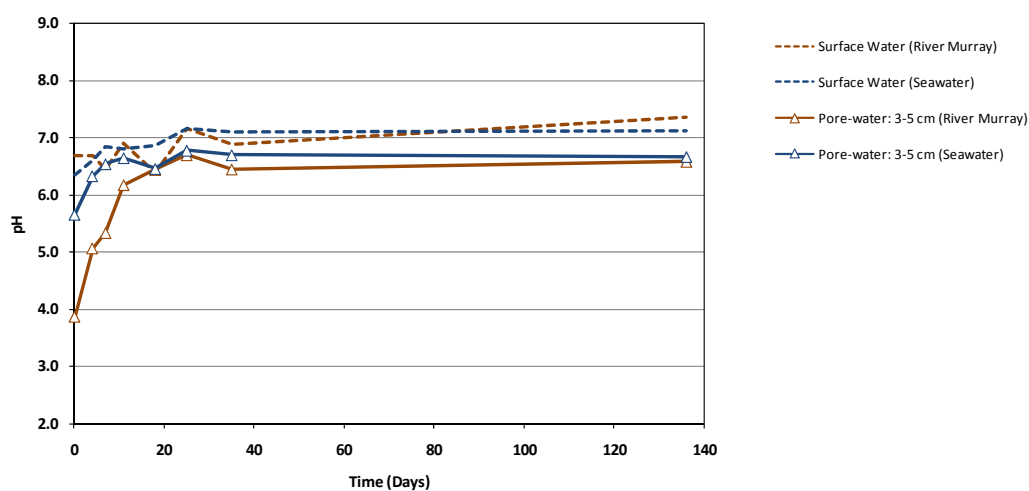


Figure 5-108. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

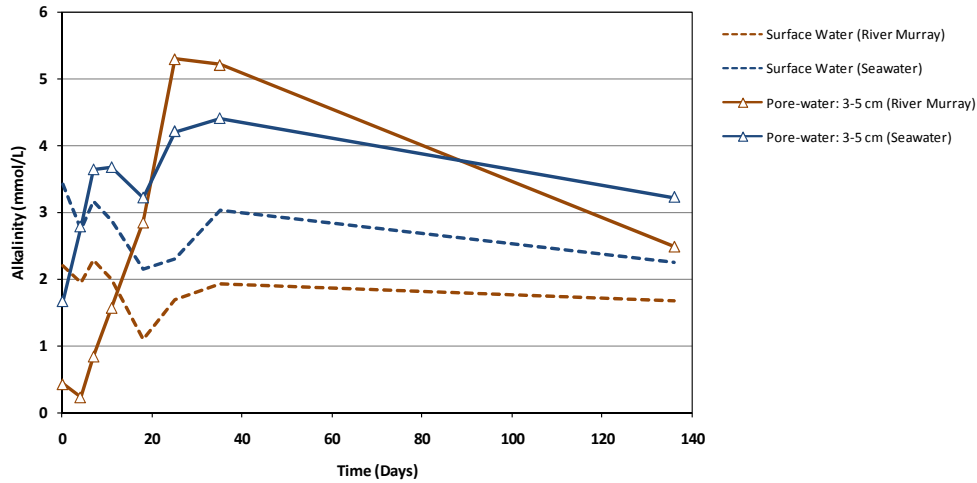


Figure 5-109. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

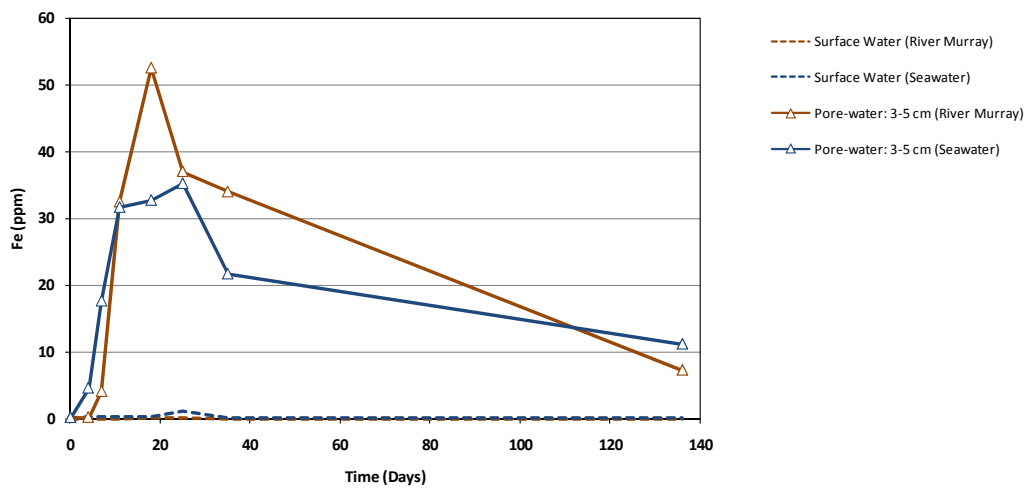


Figure 5-110. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

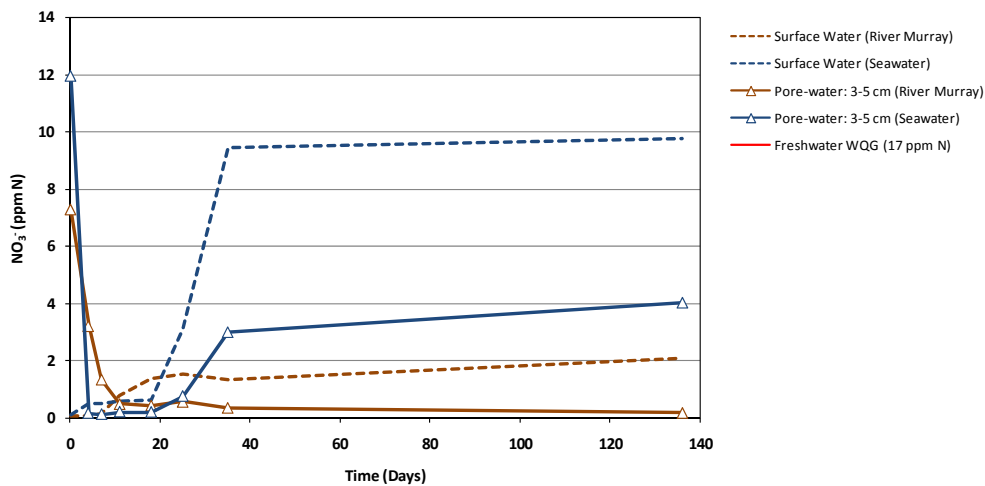


Figure 5-111. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. all values below the freshwater WQG trigger value).

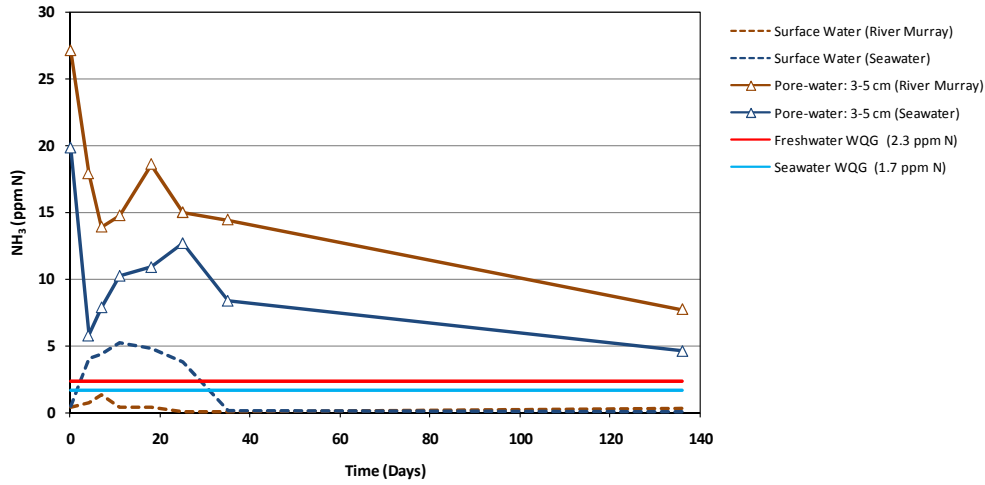


Figure 5-112. Ammonia ( $\text{NH}_3$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

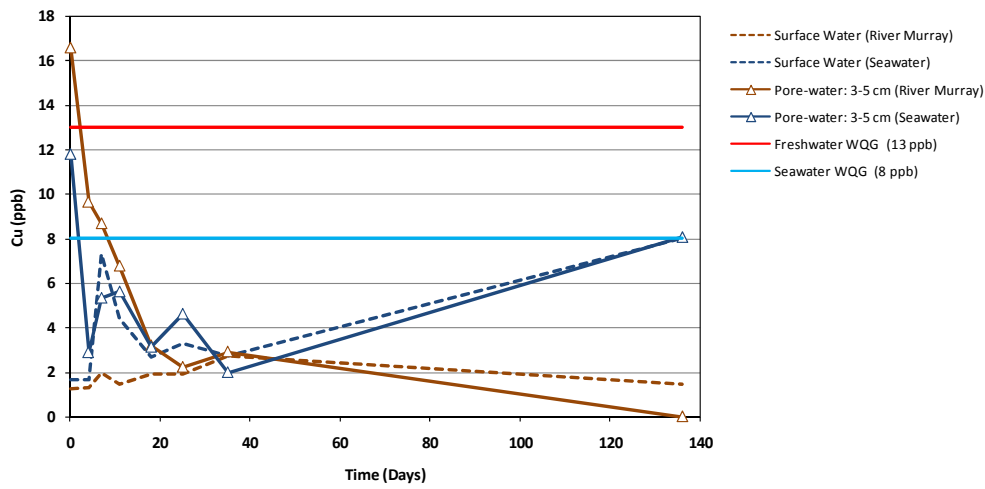


Figure 5-113. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

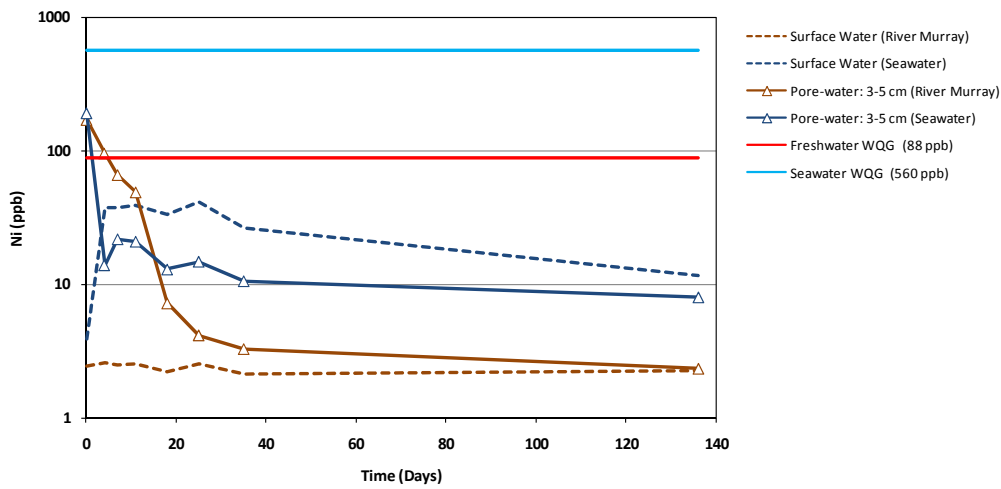


Figure 5-114. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

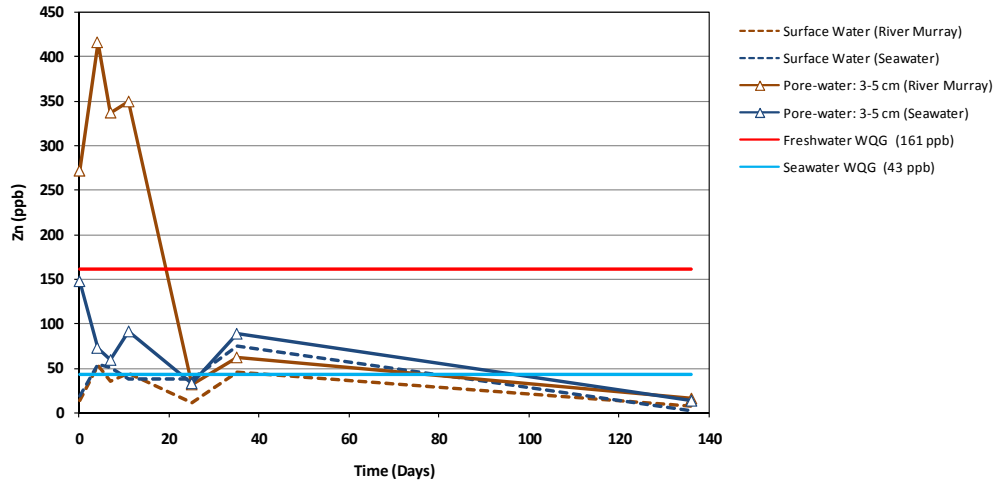


Figure 5-115. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

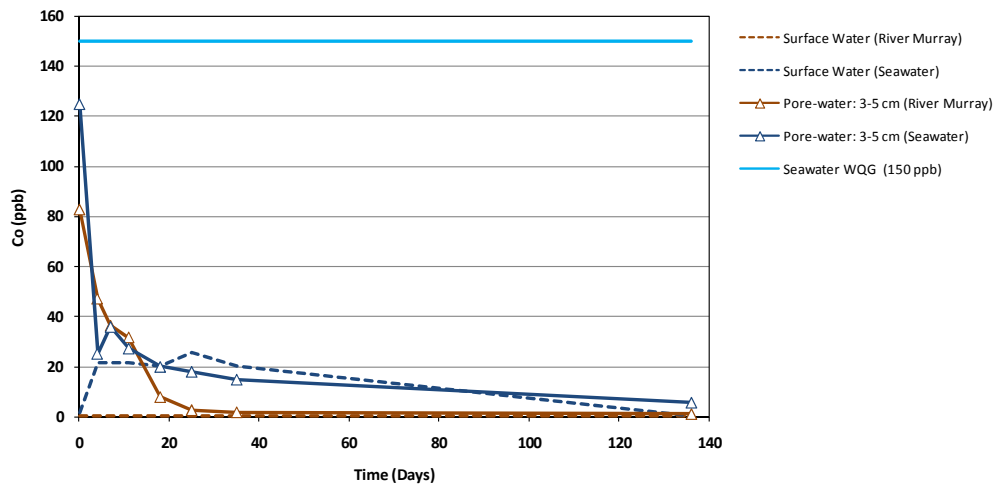


Figure 5-116. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10 (n.b. data below the laboratory LOD plotted).

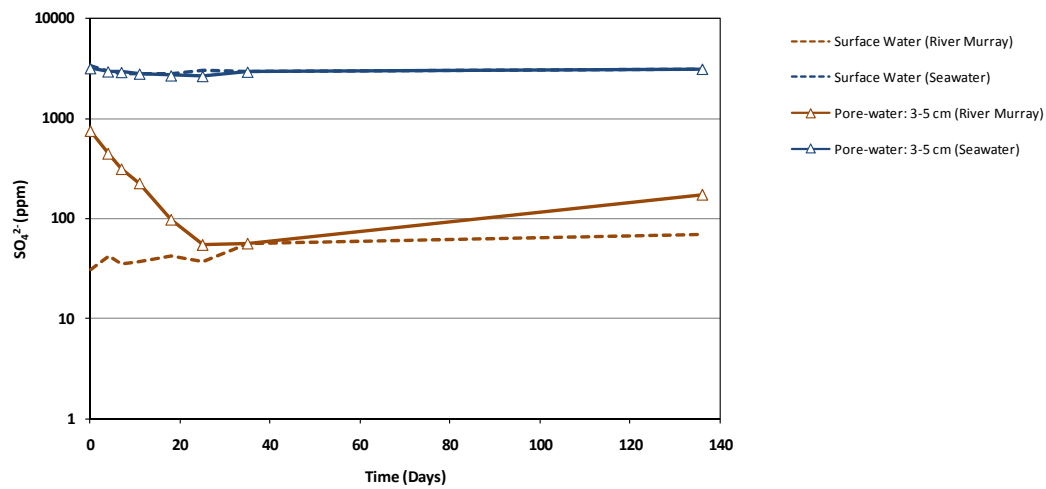


Figure 5-117. Sulfate ( $\text{SO}_4^{2-}$ ) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 10.

#### ***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<sub>3</sub>, Cu and Zn in the overlying seawaters.

If hydrological conditions dictate that mass flow (caused by for example seiche) 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<sub>3</sub>, 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<sub>3</sub> 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<sup>+</sup>/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).

- $\text{NO}_3^-$  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  $\text{NO}_3^-$  concentrations were below the ANZECC trigger value (Figure 5-121).
- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 11 days for the seawater, respectively). The  $\text{NH}_3$  concentrations did not exceed the appropriate ANZECC trigger values (Figure 5-122). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-127).

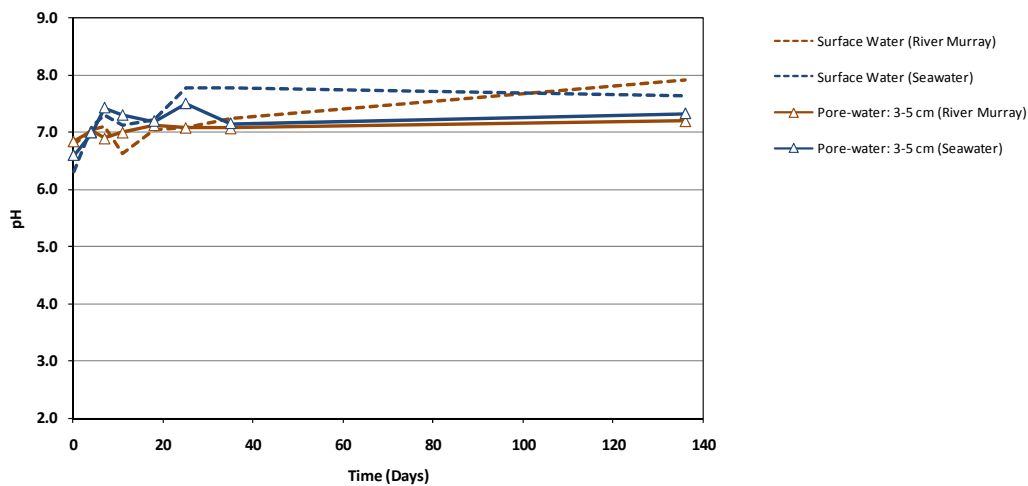


Figure 5-118. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

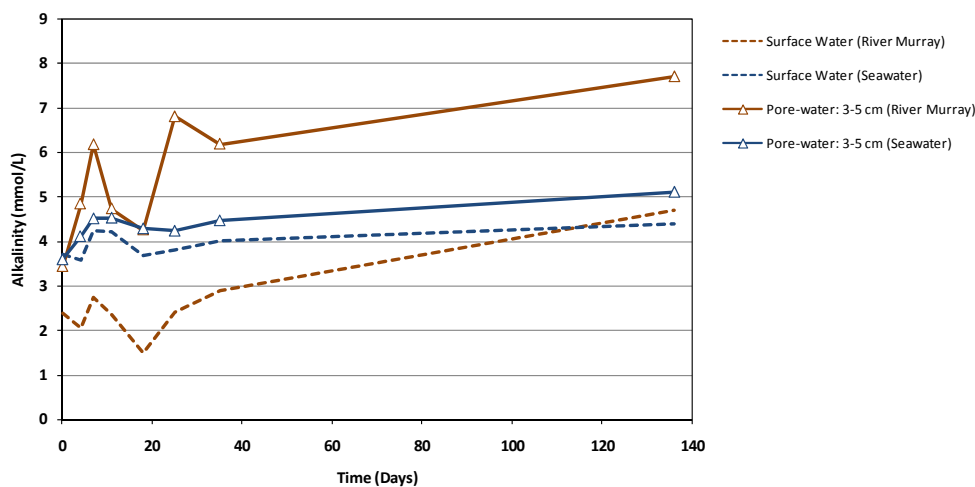


Figure 5-119. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

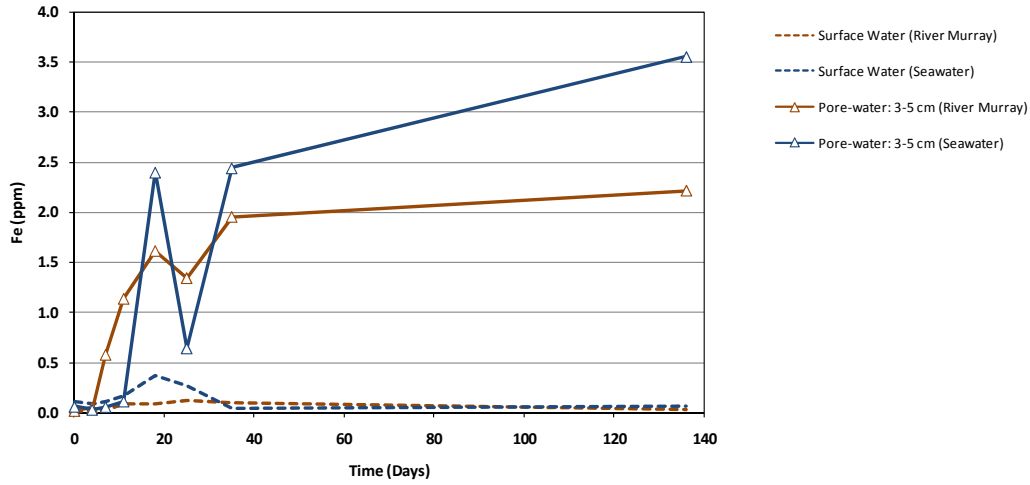


Figure 5-120. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

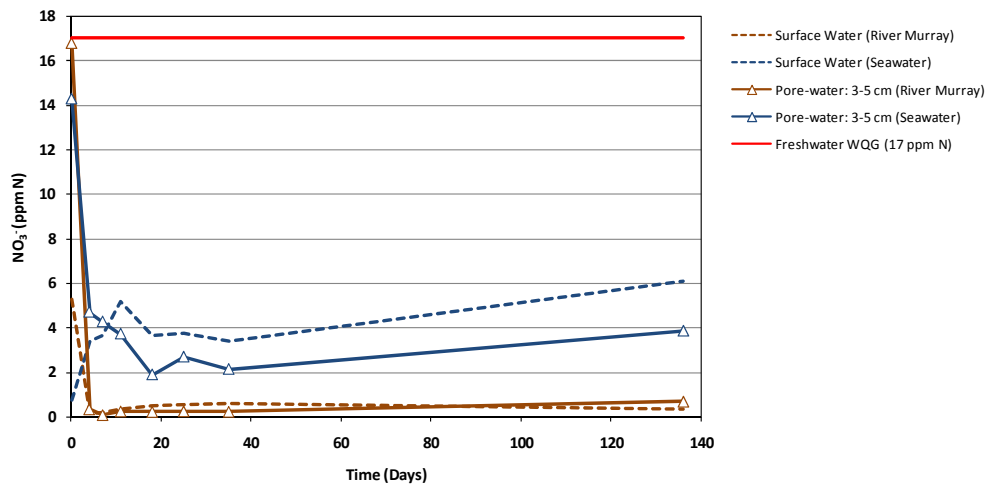


Figure 5-121. Nitrate (NO<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

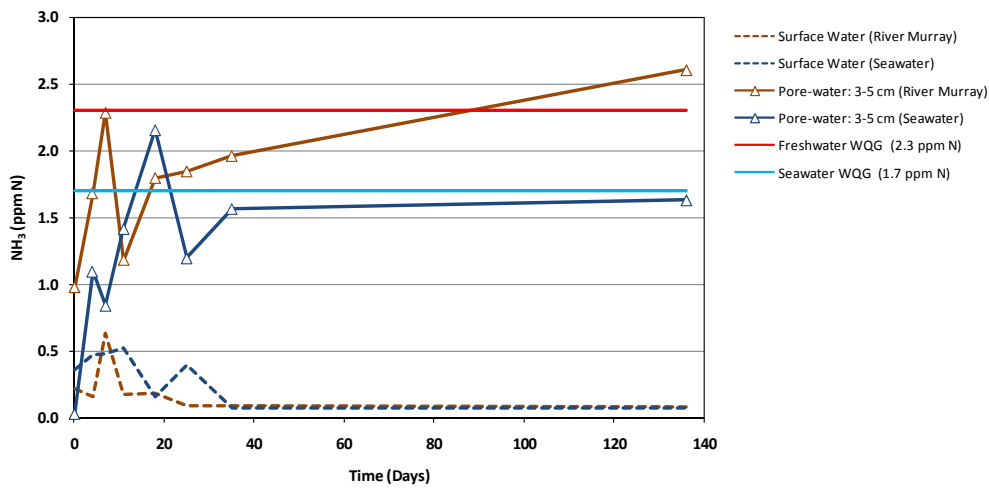


Figure 5-122. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

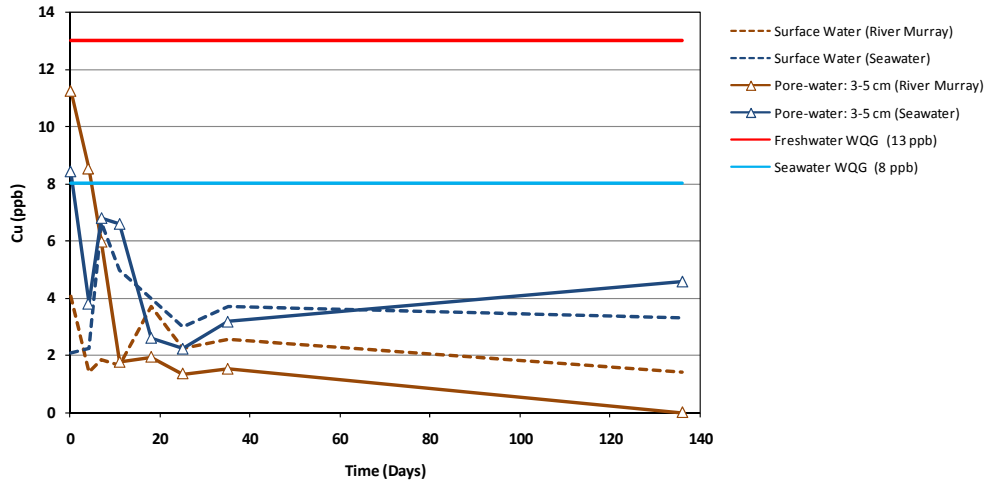


Figure 5-123. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted).

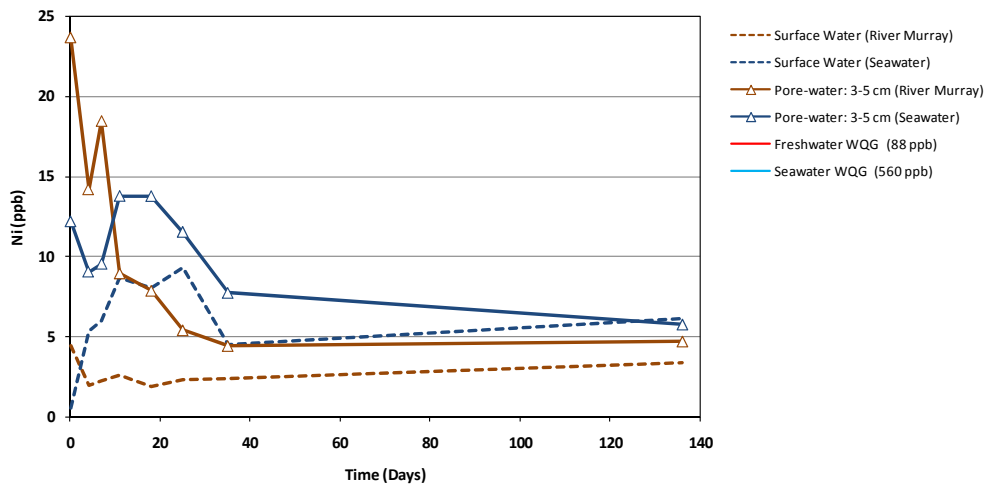


Figure 5-124. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

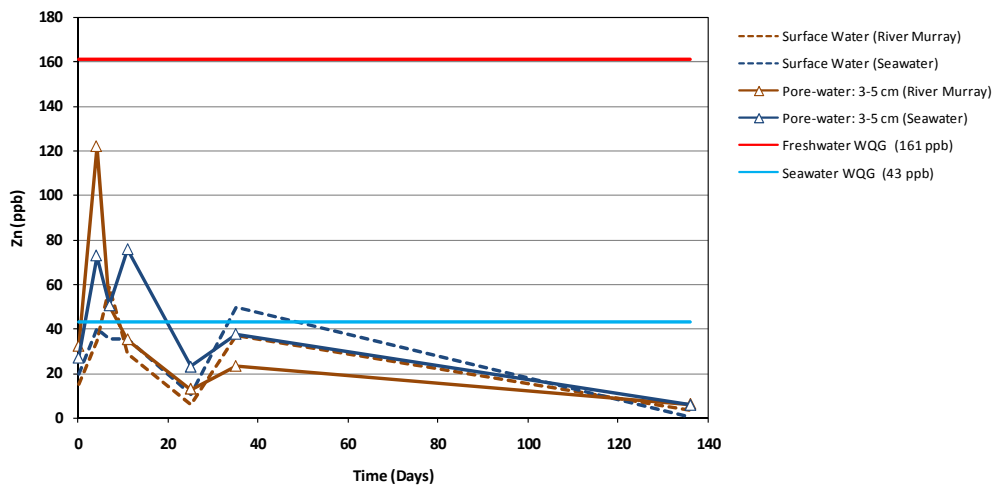


Figure 5-125. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted).

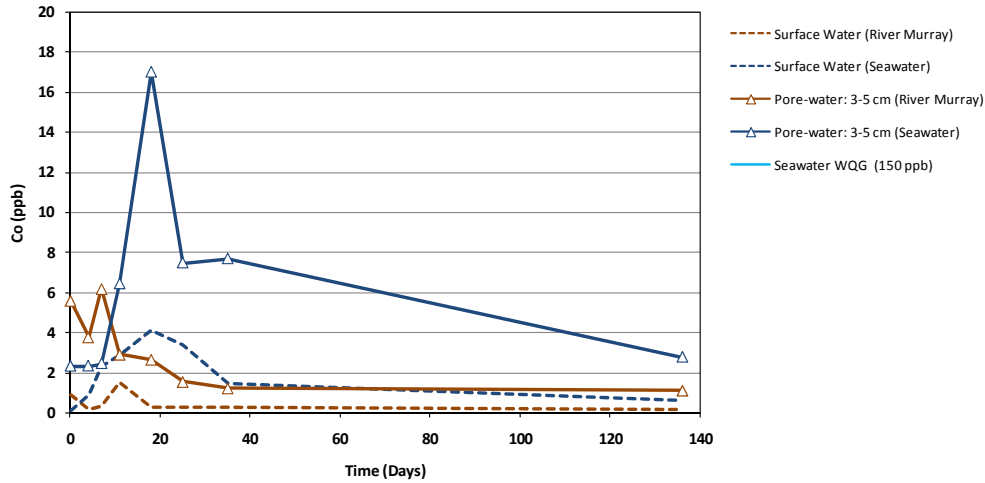


Figure 5-126. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

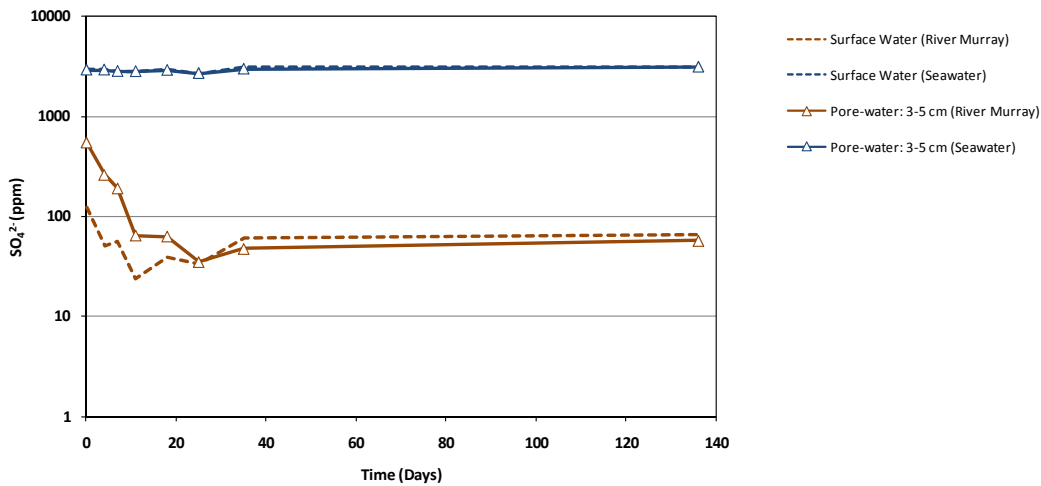


Figure 5-127. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 11.

### 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 seiche) 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<sub>3</sub>, 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<sub>3</sub> 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup> concentrations were below the ANZECC trigger value (Figure 5-131).
- NH<sub>3</sub> concentrations increased markedly in the inundation waters to levels well above the appropriate ANZECC trigger values (Figure 5-132). The concentrations of NH<sub>3</sub> in the pore-waters suggest that the increase of NH<sub>3</sub> 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<sub>4</sub> in the pore-waters during inundation with River Murray water (Figure 5-136).

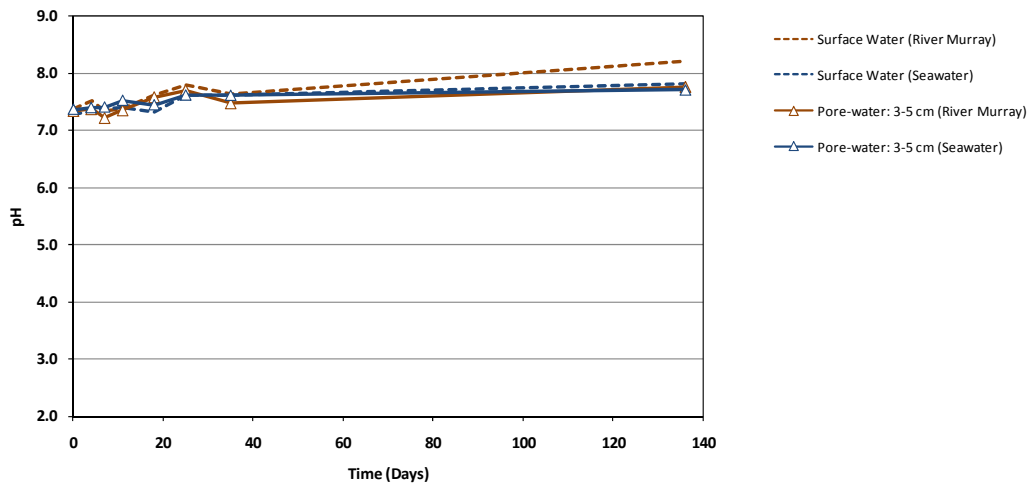


Figure 5-128. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

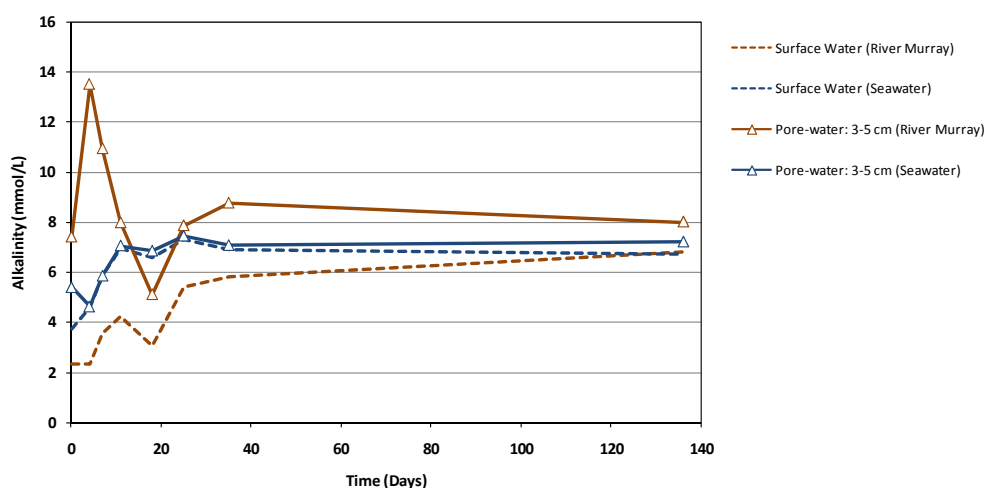


Figure 5-129. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.



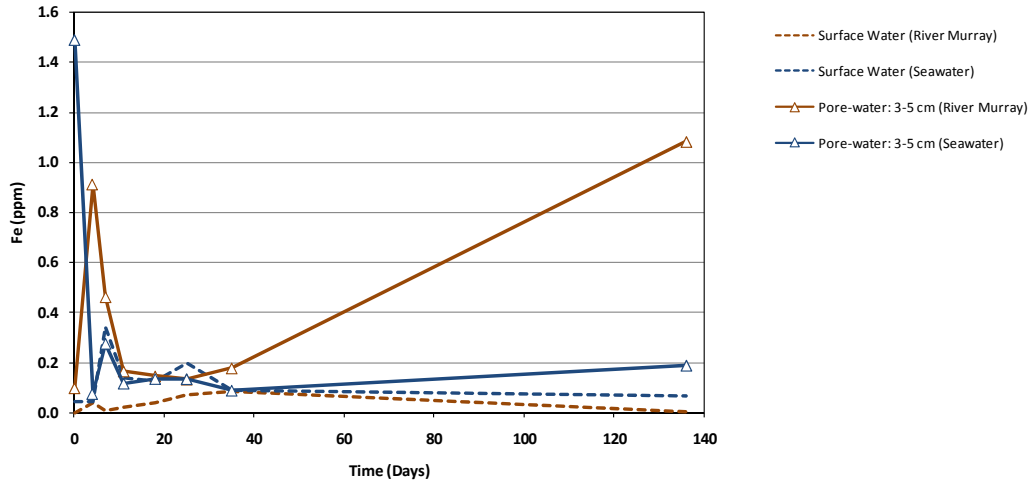


Figure 5-130. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

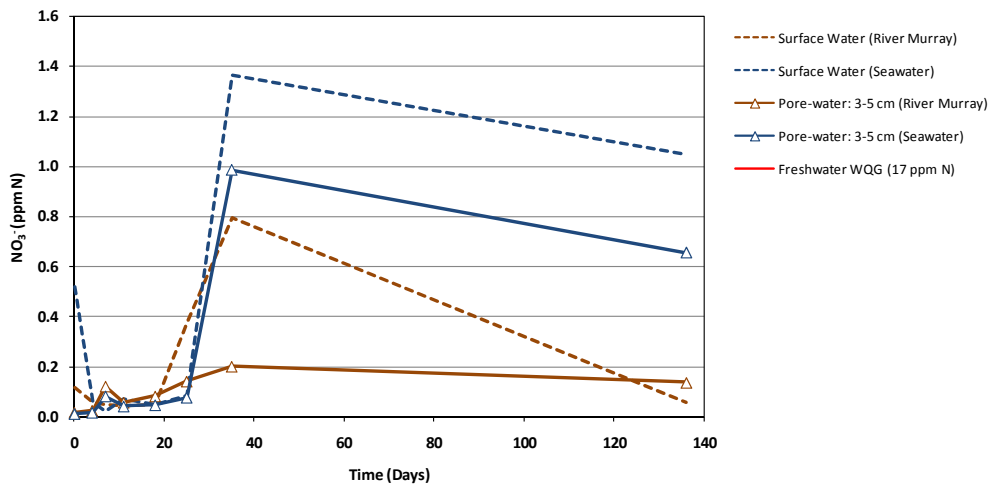


Figure 5-131. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. all values below the freshwater WQG trigger value).

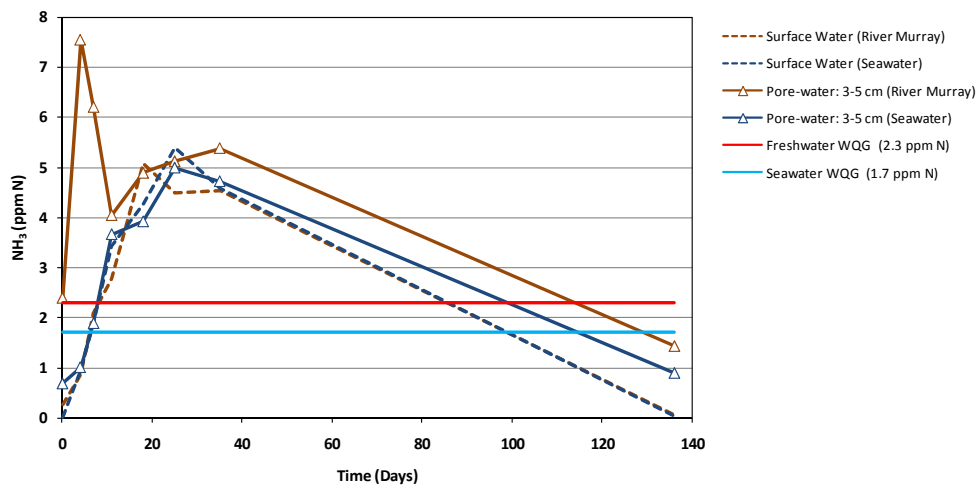


Figure 5-132. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

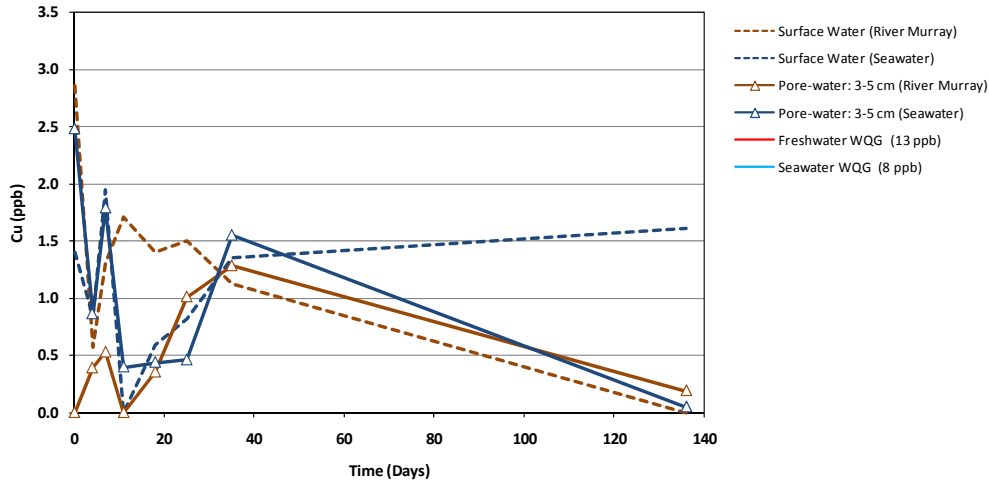


Figure 5-133. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

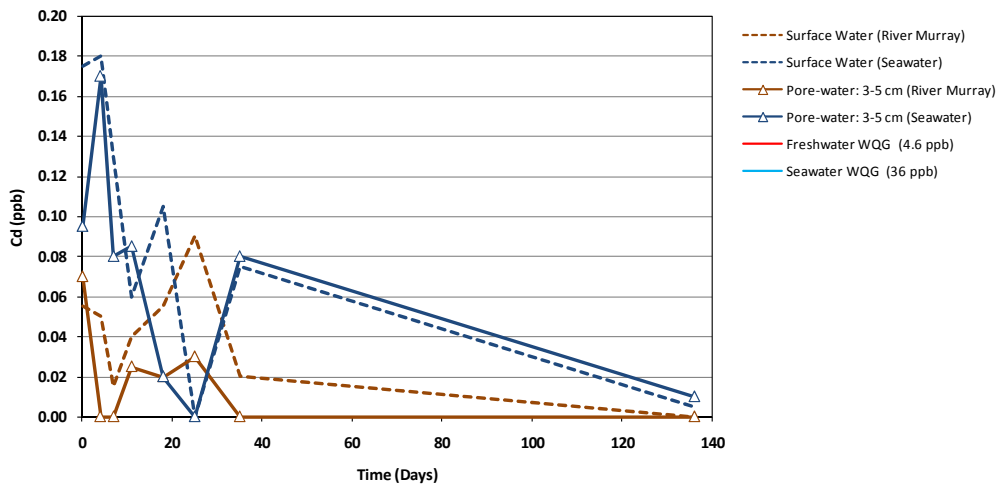


Figure 5-134. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

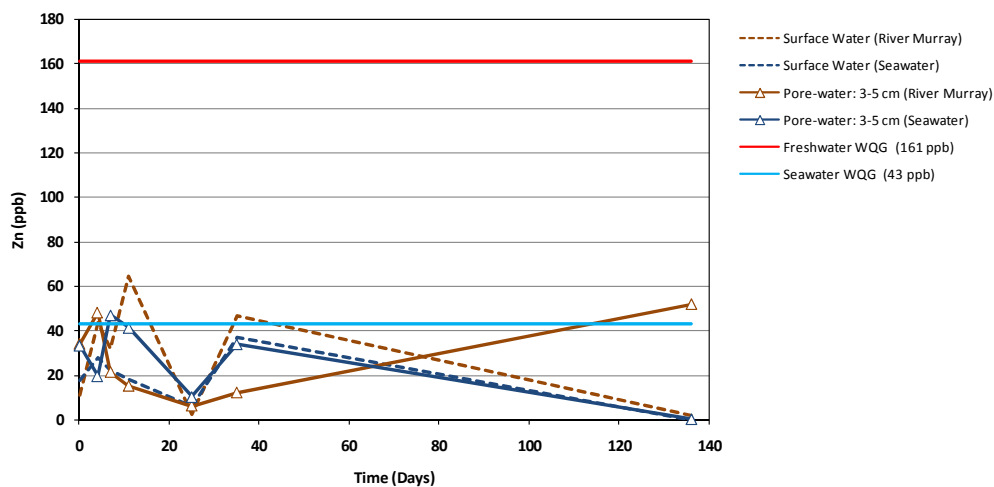


Figure 5-135. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12 (n.b. data below the laboratory LOD plotted).

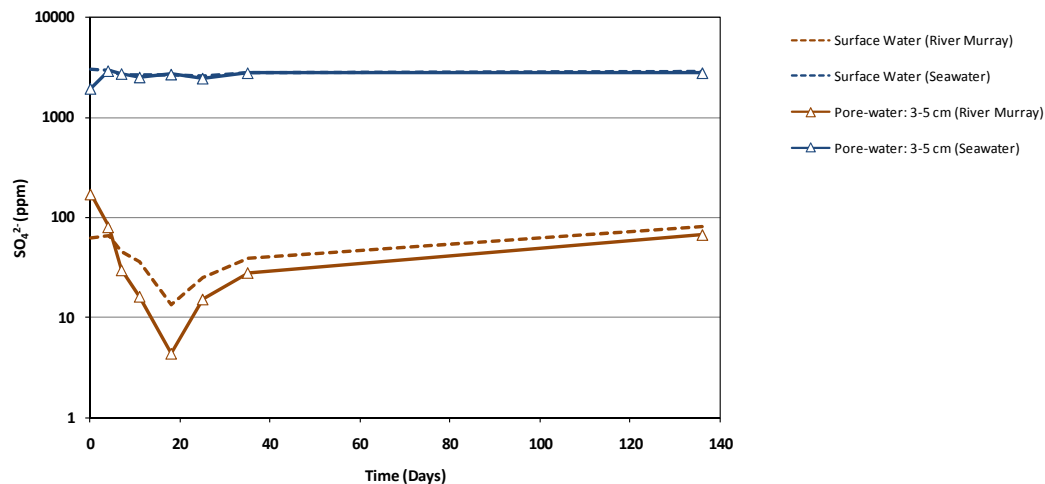


Figure 5-136. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 12.

#### 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<sub>3</sub> in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiche) 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<sub>3</sub> 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<sup>+</sup>/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).

- $\text{NO}_3^-$  concentrations increased considerably during the inundation period when River Murray water was used. However, the  $\text{NO}_3^-$  concentrations – which peaked at 35 days inundation – were lower than the ANZECC trigger value (Figure 5-140).
- $\text{NH}_3$  concentrations increased markedly in the inundation waters (peaking at 7 days for River Murray and 25 days for the seawater, respectively). The  $\text{NH}_3$  concentrations only exceeded the appropriate ANZECC trigger values for the day 136 inundation when seawater was used (Figure 5-141). The concentrations of  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-147).

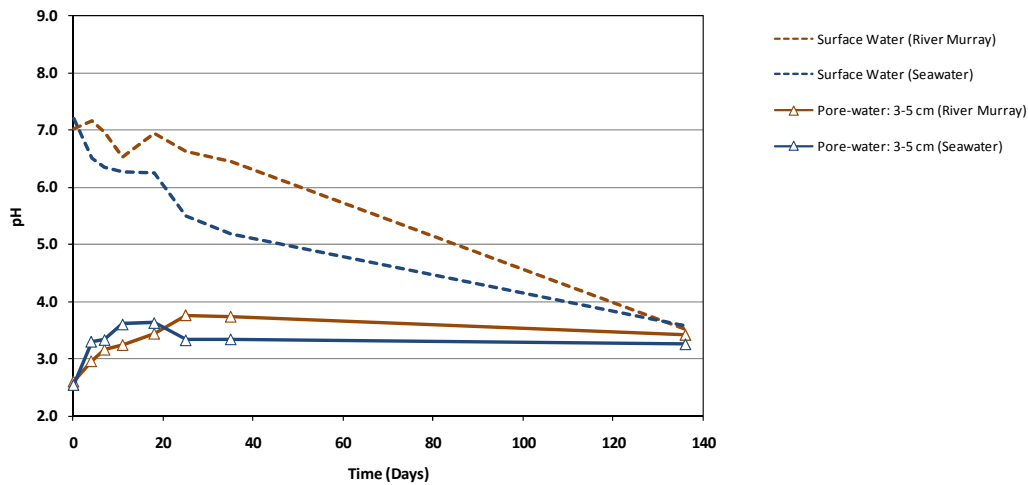


Figure 5-137. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

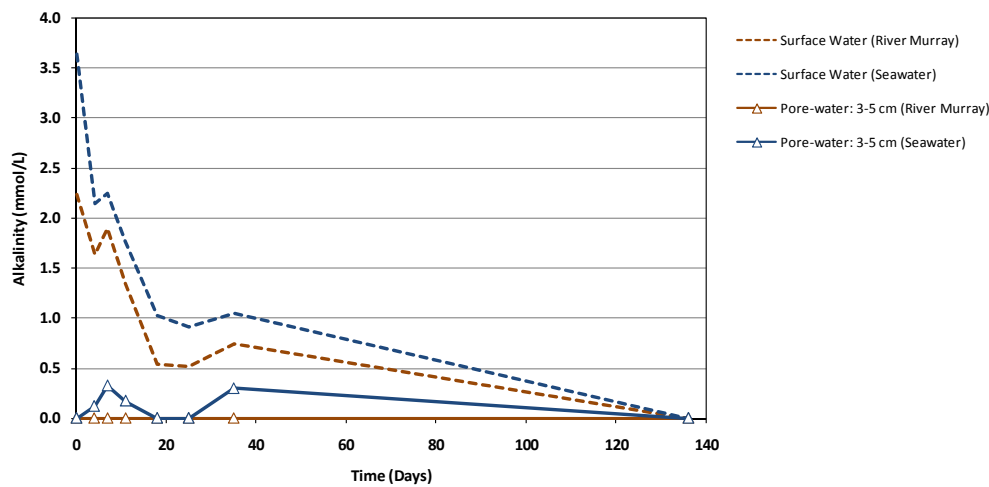


Figure 5-138. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

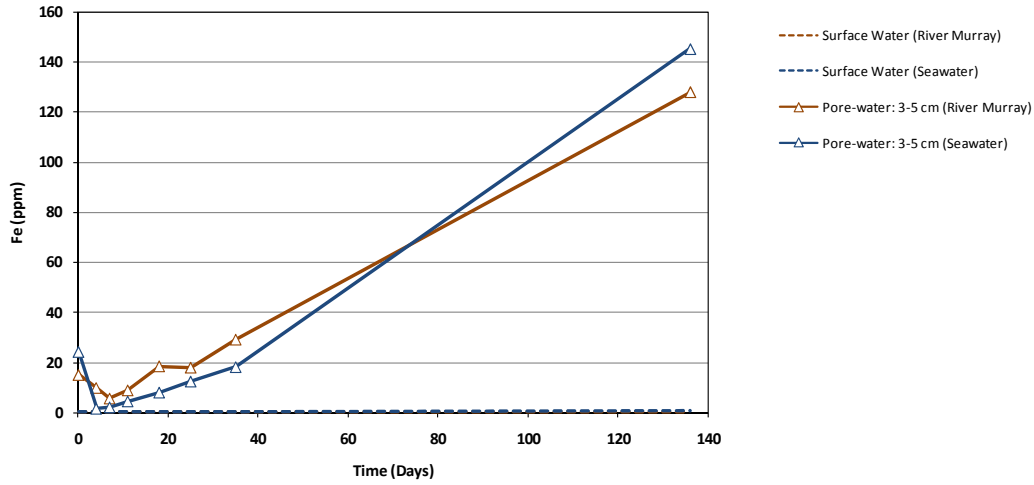


Figure 5-139. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

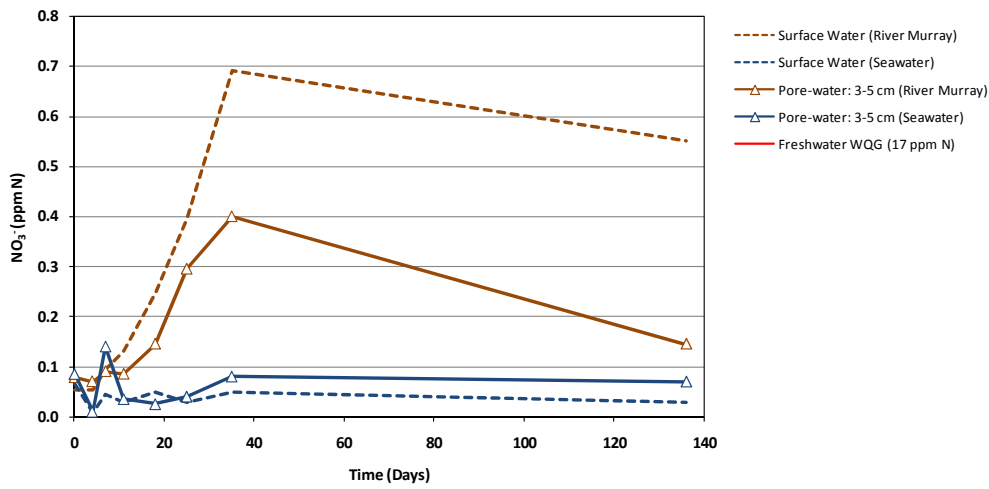


Figure 5-140. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. all values below the freshwater WQG trigger value).

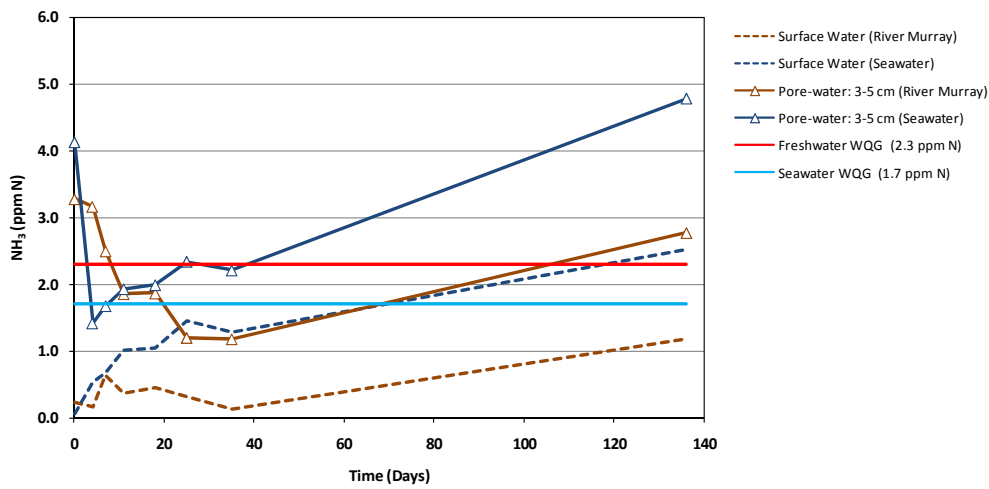


Figure 5-141. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

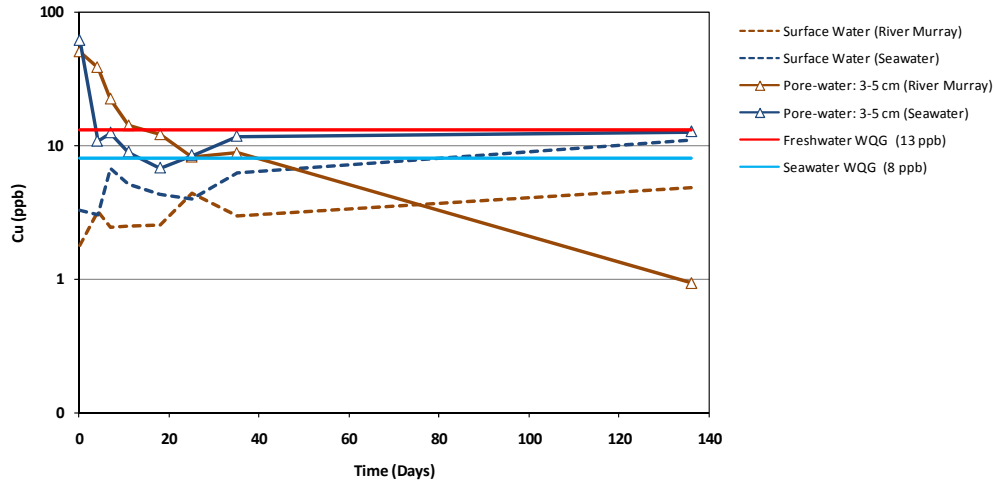


Figure 5-142. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted).

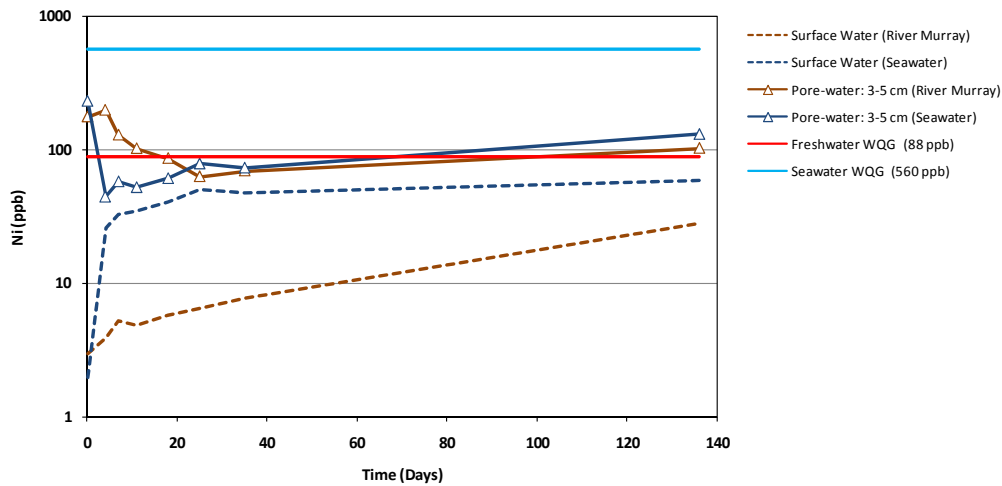


Figure 5-143. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted).

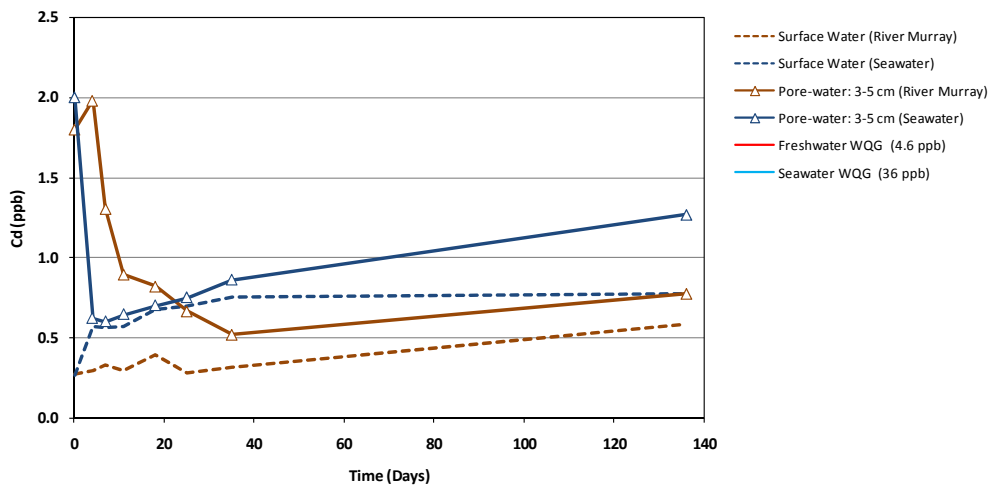


Figure 5-144. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13. (n.b. all values below the WQG trigger values).

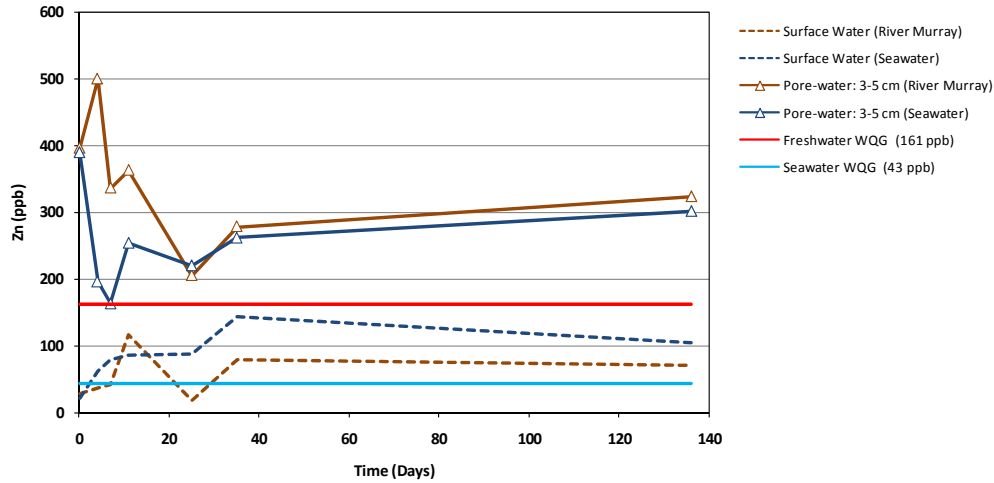


Figure 5-145. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.

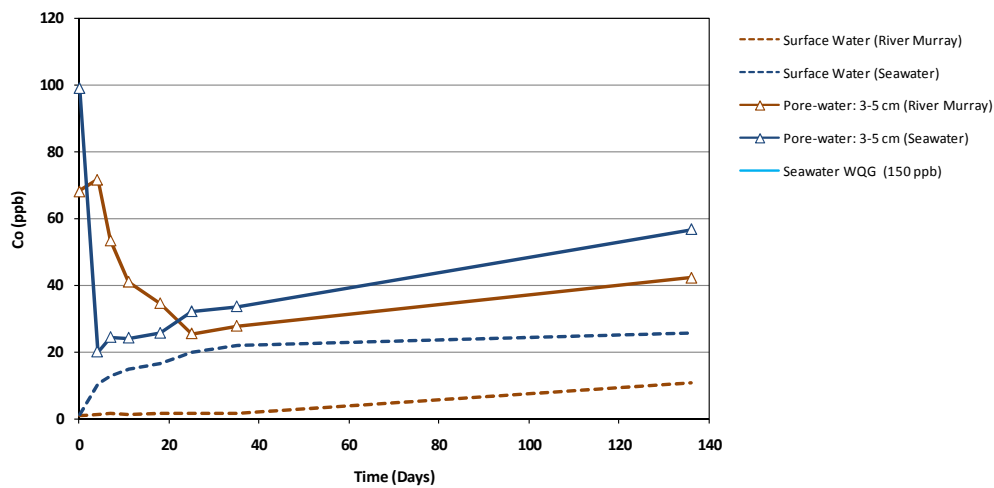


Figure 5-146. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

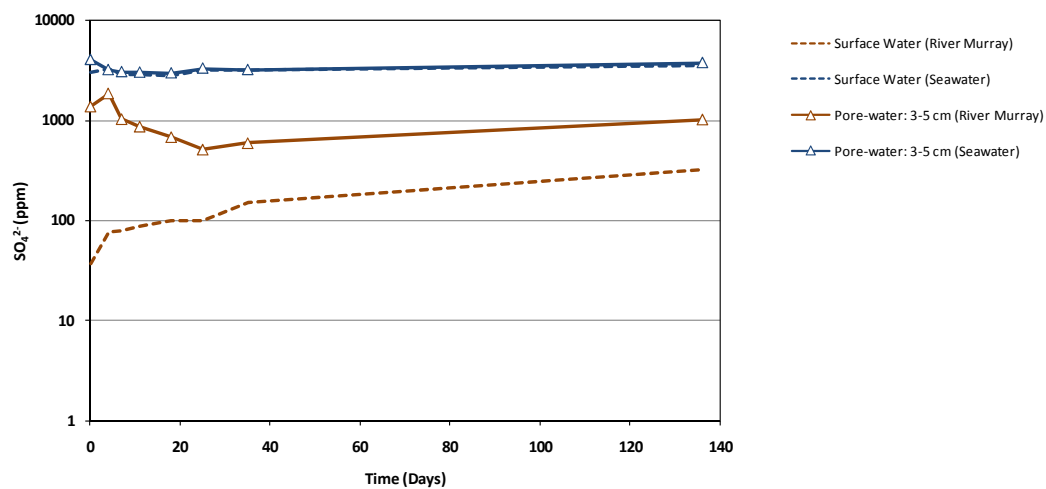


Figure 5-147. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 13.



### ***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<sub>3</sub>, 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<sub>3</sub>, 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<sub>3</sub>, 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<sup>+</sup>/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<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup> concentrations were below the ANZECC trigger value (Figure 5-151).
- NH<sub>3</sub> concentrations increased markedly in the inundation waters (especially initially in the inundating seawater). The NH<sub>3</sub> 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<sub>3</sub> in the pore-waters suggest that the increase of NH<sub>3</sub> 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<sub>4</sub> in the pore-waters during inundation with River Murray water (Figure 5-158).

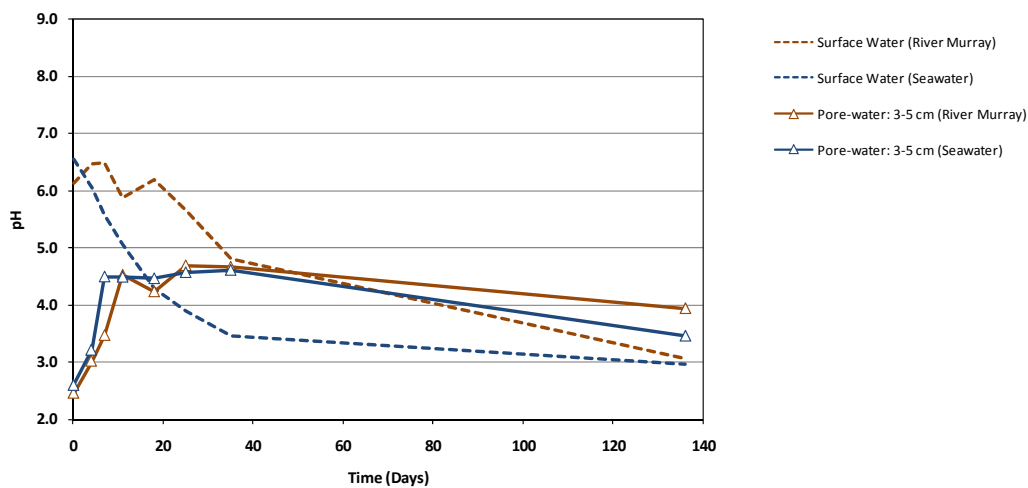


Figure 5-148. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

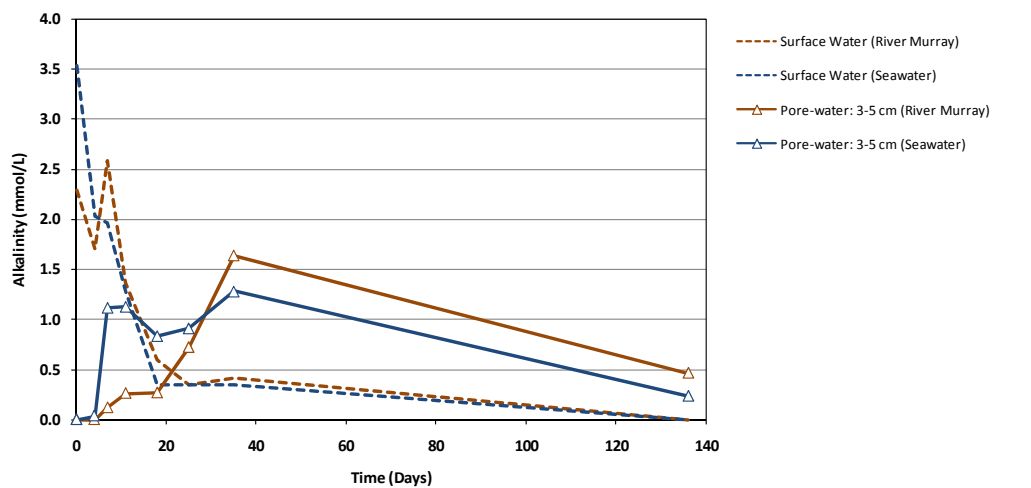


Figure 5-149. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

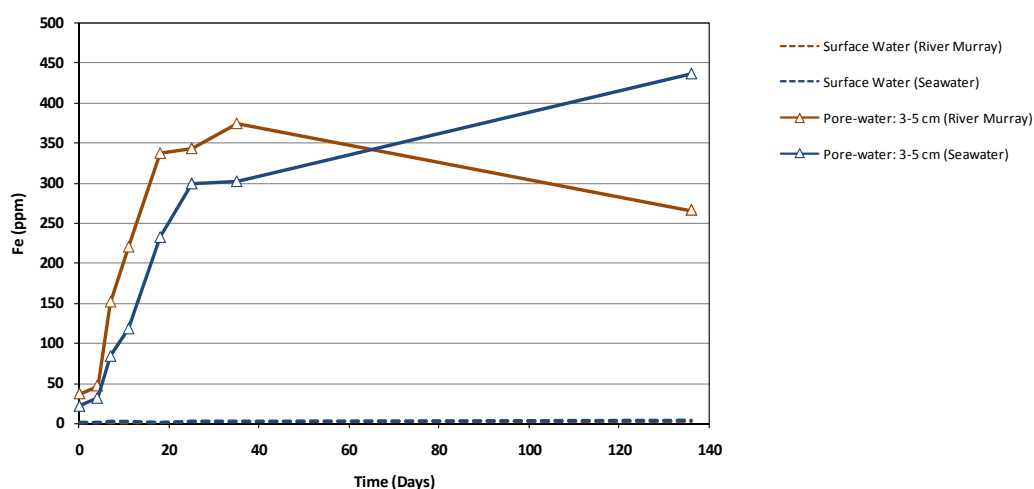


Figure 5-150. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

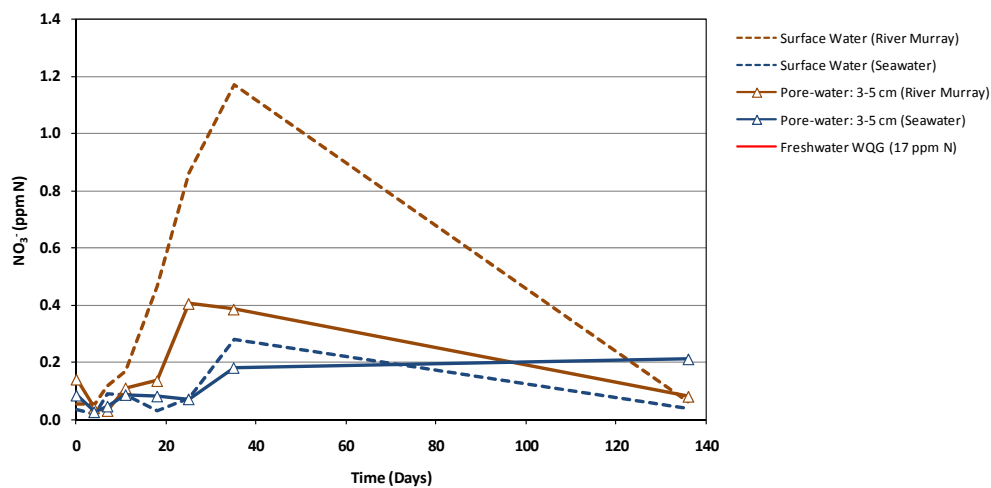


Figure 5-151. Nitrate (NO<sub>3</sub><sup>-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. all values below the freshwater WQG trigger value).

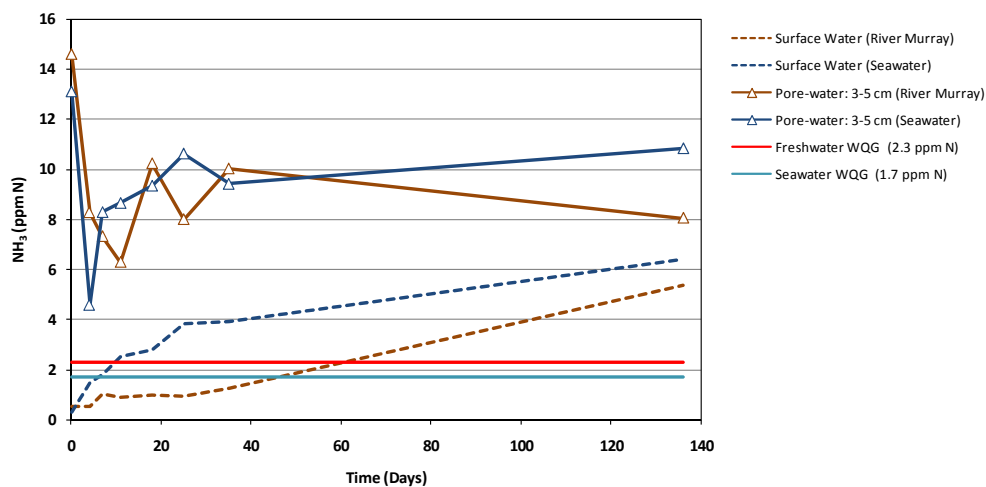


Figure 5-152. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

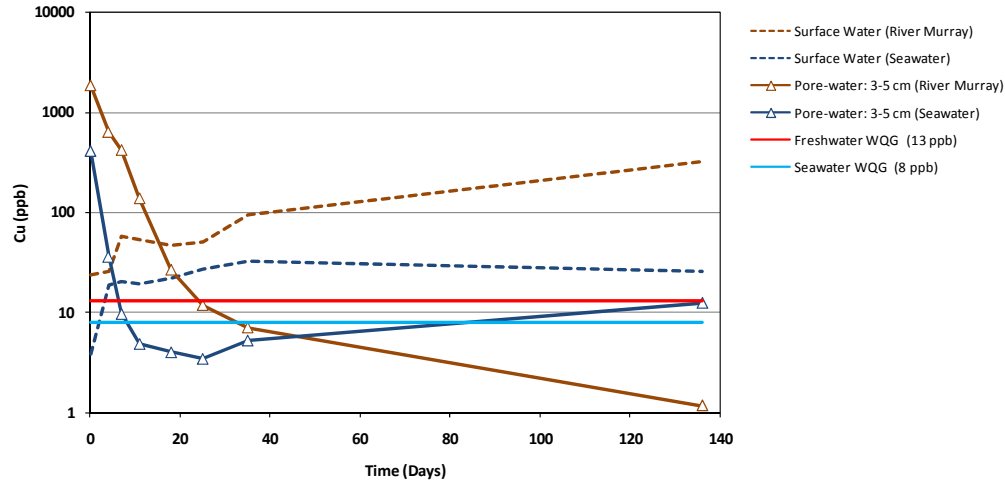


Figure 5-153. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

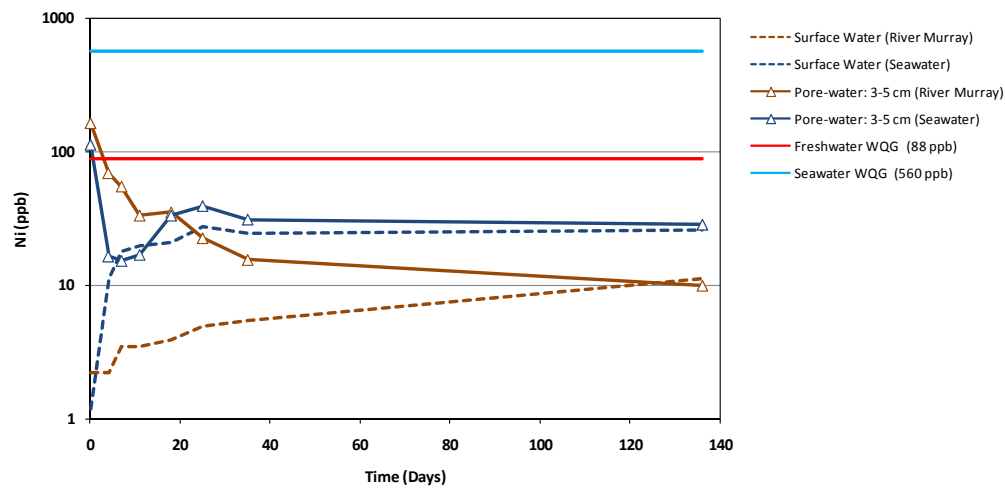


Figure 5-154. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

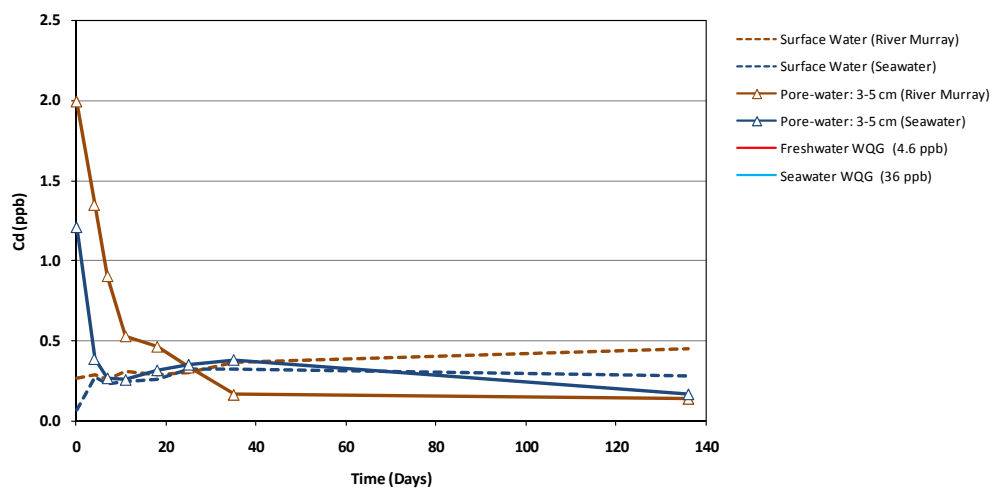


Figure 5-155. Cadmium (Cd) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

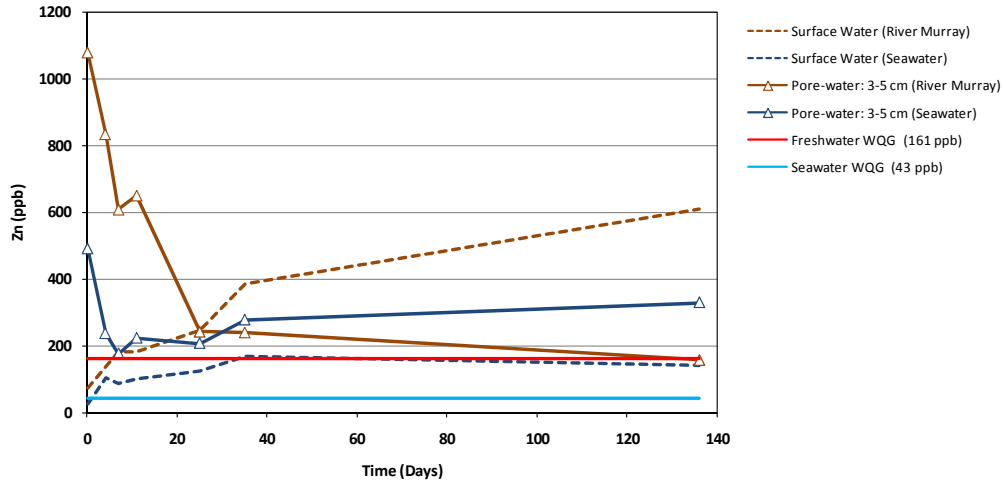


Figure 5-156. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

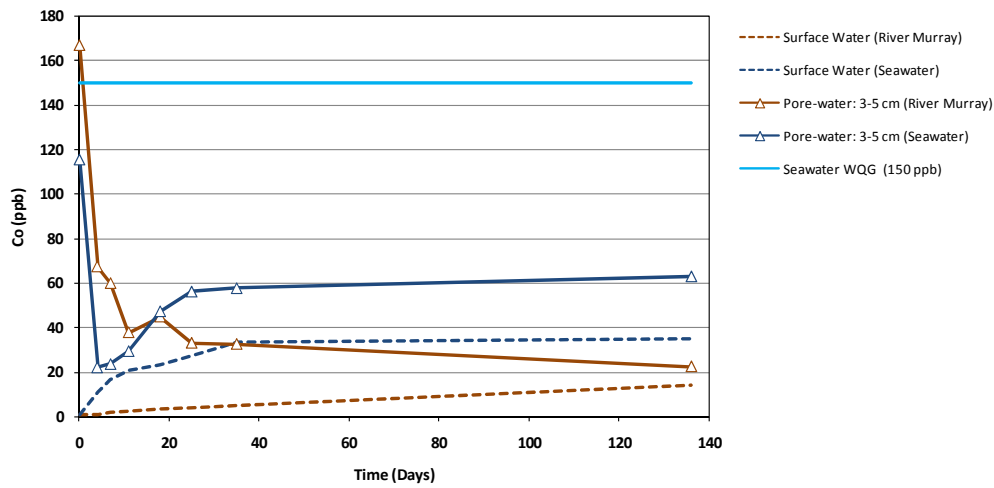


Figure 5-157. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14 (n.b. data below the laboratory LOD plotted).

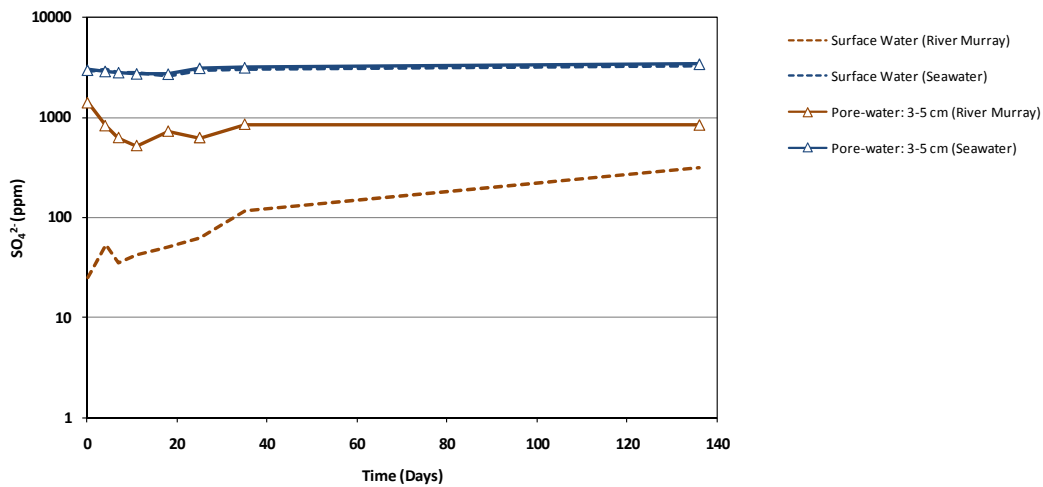


Figure 5-158. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 14.

#### **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<sub>3</sub>, and Zn in the overlying waters.

If hydrological conditions dictate that mass flow (caused by for example seiche) 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<sub>3</sub> 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, the 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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>.

### 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<sup>+</sup>/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).



- $\text{NH}_3$  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  $\text{NH}_3$  in the pore-waters suggest that the increase of  $\text{NH}_3$  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  $\text{SO}_4$  in the pore-waters during inundation with River Murray water (Figure 5-168).

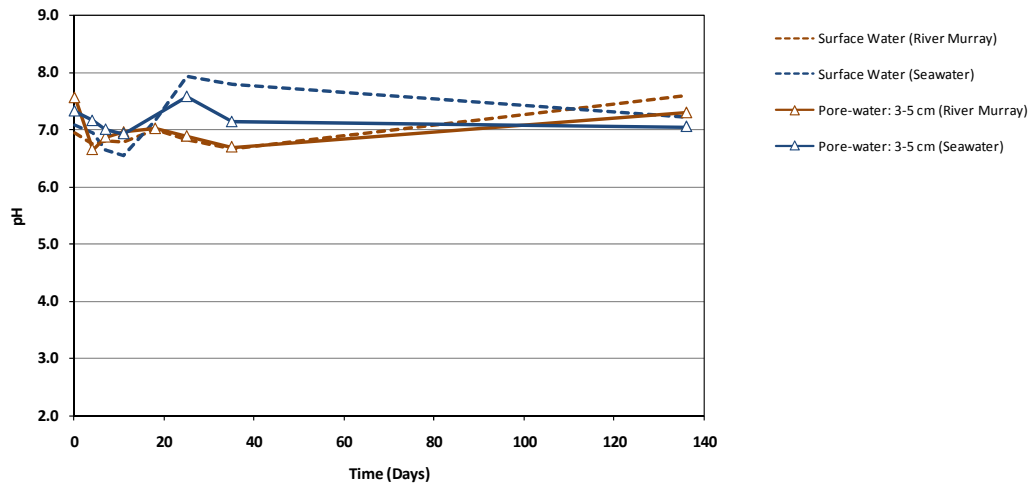


Figure 5-159. pH dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

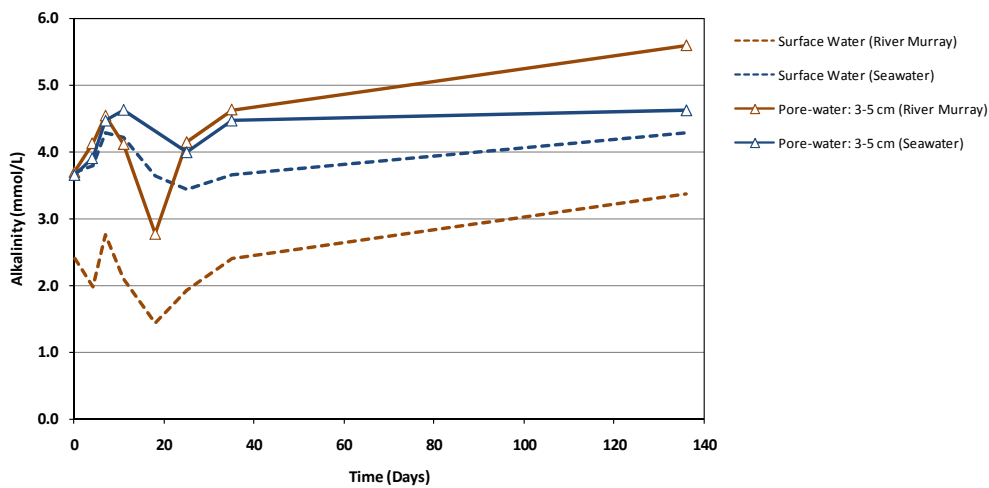


Figure 5-160. Alkalinity dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

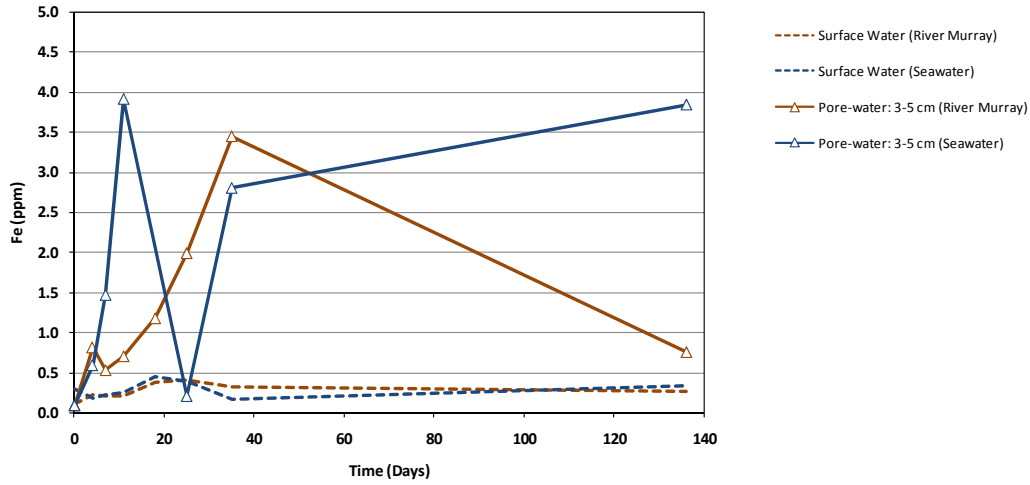


Figure 5-161. Total iron (Fe) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

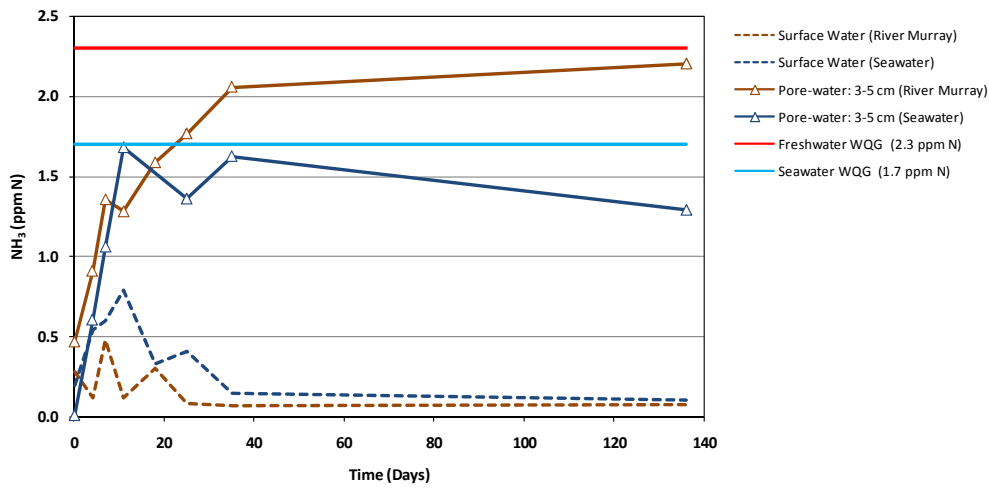


Figure 5-162. Ammonia (NH<sub>3</sub>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

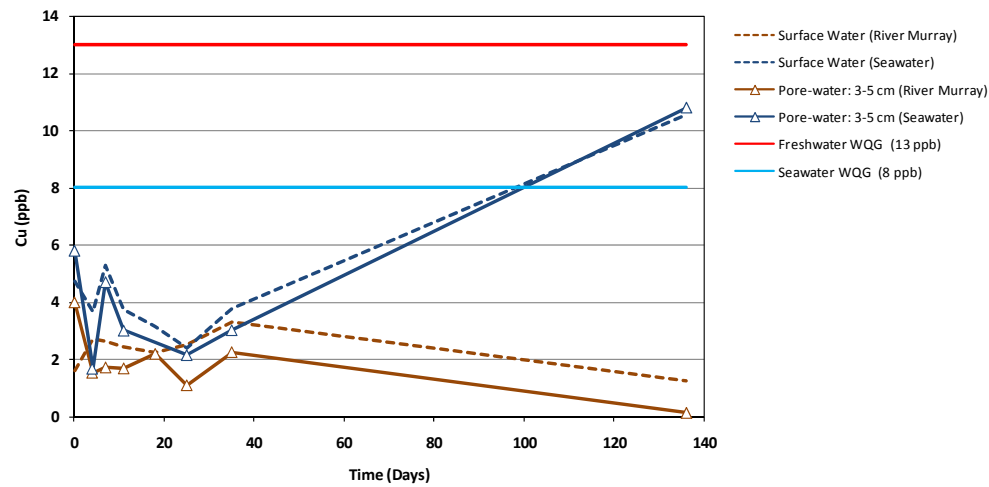


Figure 5-163. Copper (Cu) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

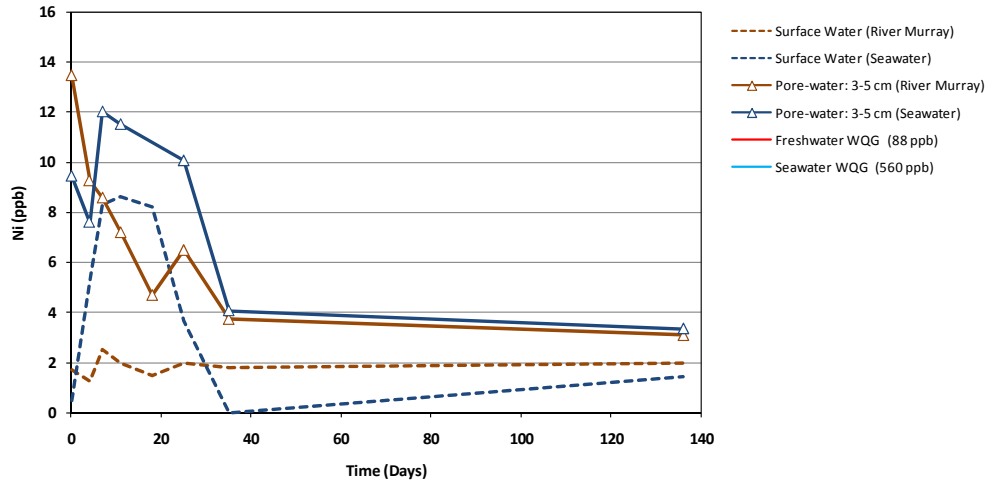


Figure 5-164. Nickel (Ni) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the WQG trigger values).

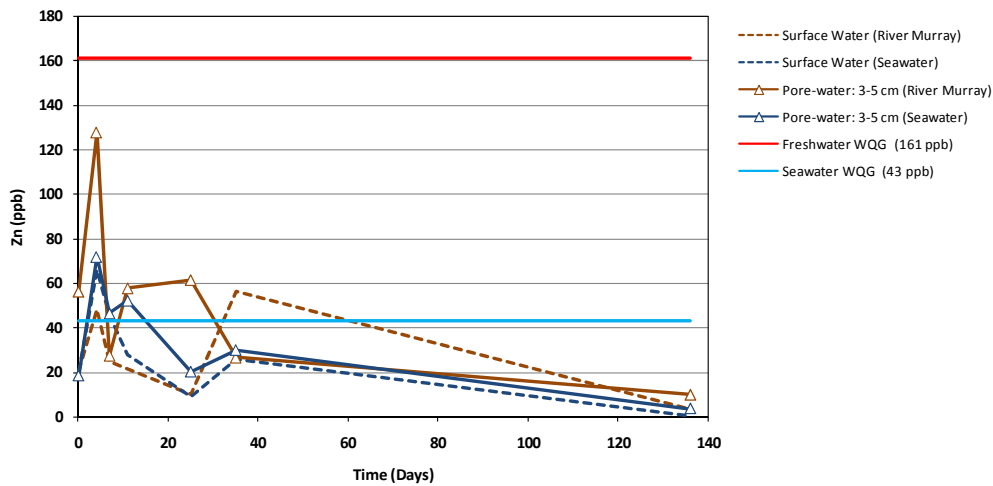


Figure 5-165. Zinc (Zn) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted).

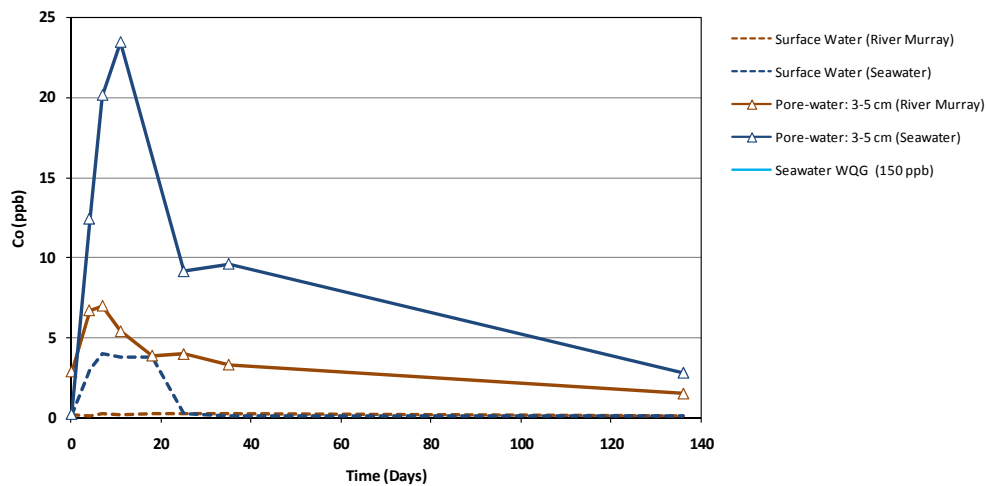


Figure 5-166. Cobalt (Co) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the seawater WQG trigger value).

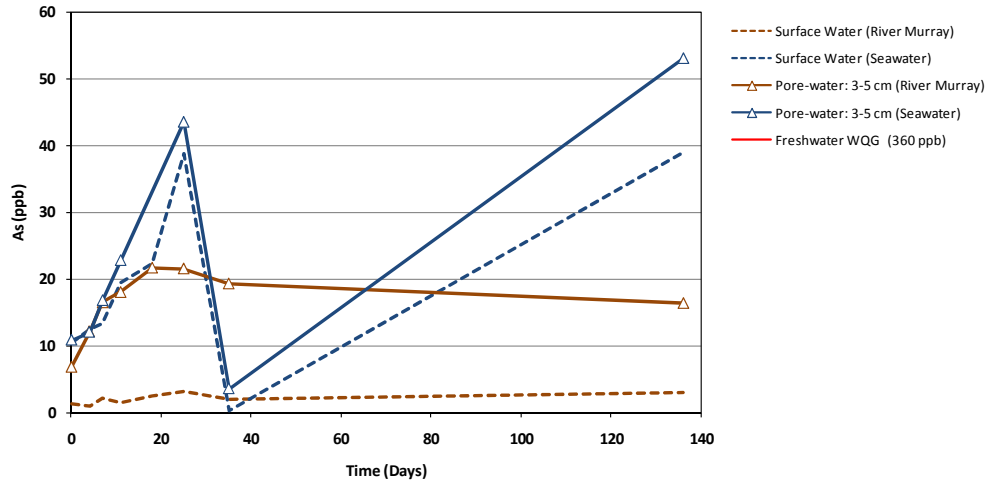


Figure 5-167. Arsenic (As) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15 (n.b. data below the laboratory LOD plotted and all values below the freshwater WQG trigger value).

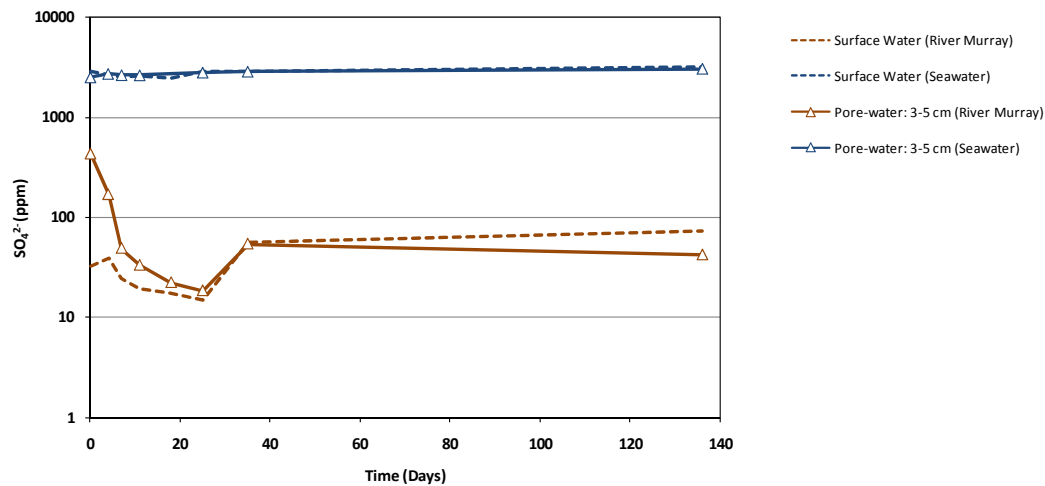


Figure 5-168. Sulfate (SO<sub>4</sub><sup>2-</sup>) dynamics of the surface water and 3-5 cm pore-water following inundation of the soil material at Site 15.

### 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 seiche) 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<sub>3</sub> 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  $\text{Na}^+$ ,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ , 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  $\text{H}^+$  and  $\text{Al}^{3+}$ , 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 ( $\text{Al}^{3+}$ ,  $\text{Fe}^{2+}$  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  $\text{Fe}^{2+}$  releases  $\text{H}^+$  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  $\text{Fe}^{2+}$  from Fe (III) oxides with a slightly acidic solution can stimulate desorption of  $\text{Fe}^{2+}$  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) over 136 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 than 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<sup>+</sup>/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<sup>+</sup>/t) in surface sediment (0-4 cm) prior to inundation.

Site No.	Site Name	TAA (mol H <sup>+</sup> /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 <sub>Max</sub> (ppm)		pH <sub>Max</sub>		Eh <sub>Min</sub> (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<sub>3</sub><sup>-</sup>)

A summary of the maximum surface water NO<sub>3</sub><sup>-</sup> 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<sub>3</sub><sup>-</sup> 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<sub>3</sub>)

A summary of the maximum surface water NH<sub>3</sub> 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<sub>3</sub> 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<sub>3</sub> 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<sub>4</sub><sup>2-</sup>)

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 $^{35}\text{SO}_4^{2-}$ incubation method

The mean sulfate reduction rates at 2 sediment depths (i.e. 0-4 cm and 4-8 cm) using the  $^{35}\text{SO}_4^{2-}$  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/cm<sup>3</sup>/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/cm<sup>3</sup>/day.

Table 5-16. Mean sulfate reduction rates at day 136 as measured using the  $^{35}\text{SO}_4^{2-}$  incubation method (nmol/cm<sup>3</sup>/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

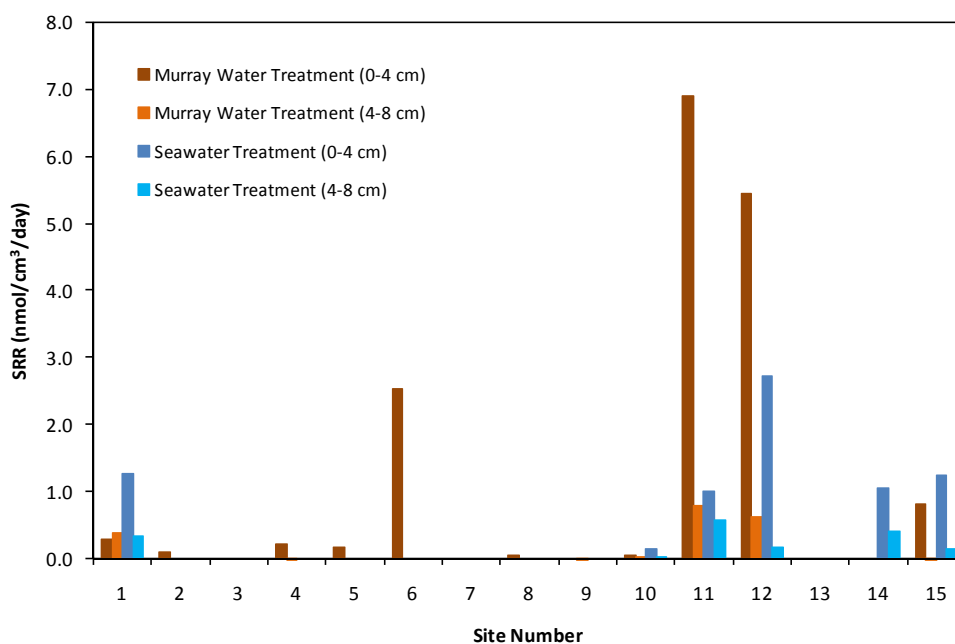


Figure 5-169. Comparison of the mean sulfate reduction rates (SSR) following inundation with River Murray and seawater using the  $^{35}\text{SO}_4^{2-}$  incubation method.



#### 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/cm<sup>3</sup>/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/cm<sup>3</sup>/day for River Murray water inundation and 34.82 nmol/cm<sup>3</sup>/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/cm<sup>3</sup>/day for River Murray water inundation and 17.16 nmol/cm<sup>3</sup>/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/cm<sup>3</sup>/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/cm<sup>3</sup>/day for River Murray water inundation and 37.19 nmol/cm<sup>3</sup>/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<sup>3</sup>/day for River Murray water inundation and 7.47 nmol/cm<sup>3</sup>/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 <sup>35</sup>SO<sub>4</sub><sup>2-</sup> 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 notwithstanding 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 <sup>35</sup>SO<sub>4</sub><sup>2-</sup> 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<sup>3</sup>/day a value nearly an order of magnitude higher than that gained from the <sup>35</sup>SO<sub>4</sub><sup>2-</sup> method when used at day 136. Use of **7** nmol/cm<sup>3</sup>/day will result in a mean acidification rate of **-0.014** mol H<sup>+</sup>/m<sup>3</sup>/day (or to use their respective values, **-0.011** mol H<sup>+</sup>/m<sup>3</sup>/day for inundation with River Murray water, and **-0.016** mol H<sup>+</sup>/m<sup>3</sup>/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  $^{35}\text{SO}_4^{2-}$  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.

### Sulfate reduction rate over 136 days vs sulfate concentration at day 136

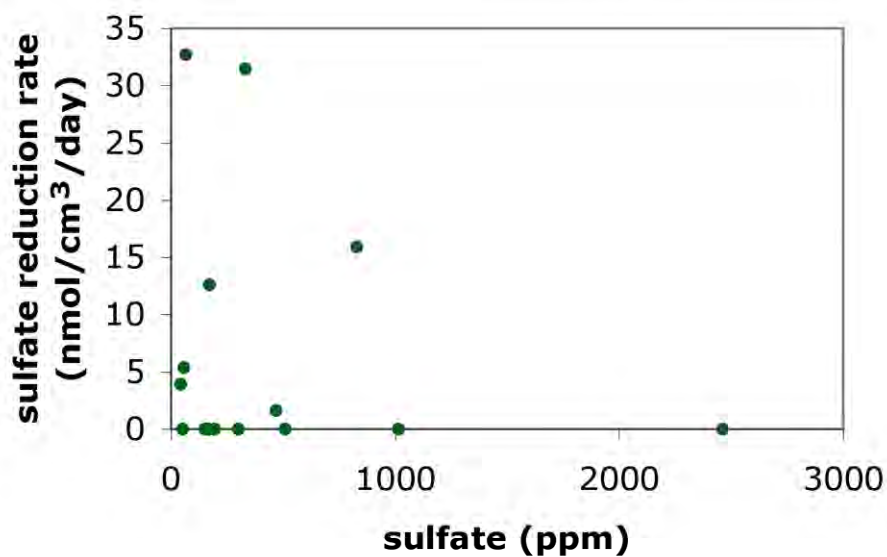


Figure 5-170. Comparison of the mean sulfate reduction rates (SSR) in the 0-4 cm sediment layer following inundation with River Murray water over 136 days using CRS data with sulfate concentrations in the 3-5 cm layer at day 136.

**Sulfate reduction rate over 136 days  
in 0-4 cm layer vs organic carbon at  
day 136**

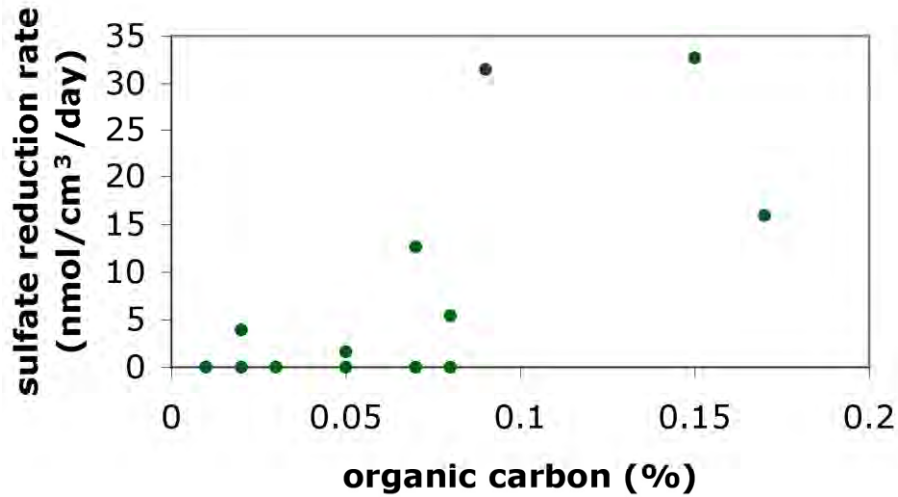


Figure 5-171. Comparison of the mean sulfate reduction rates (SSR) in the 0-4 cm sediment layer following inundation with River Murray water over 136 days using CRS data with organic carbon concentrations in the 3 -5 cm layer at day 136.

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<sub>3</sub> 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 <sub>3</sub> , 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	-	<b>Cu, Zn</b>
8	Point Sturt (North), Lake Alexandrina	-	<b>NH<sub>3</sub>, Cu, Zn</b>
9	Point Sturt (North), Lake Alexandrina	-	Zn
10	Milang, Lake Alexandrina	-	NH <sub>3</sub> , <b>Cu, Zn</b>
11	Milang, Lake Alexandrina	-	Zn
12	Ewe Island Barrage	NH <sub>3</sub>	NH <sub>3</sub> , Zn
13	Currency Creek	-	<b>NH<sub>3</sub>, Cu, Zn</b>
14	Poltalloch Station, Lake Alexandrina	<b>NH<sub>3</sub>, Cu, Zn</b>	<b>NH<sub>3</sub>, Cu, Zn</b>
15	Poltalloch Station, Lake Alexandrina	-	<b>Cu, Zn</b>

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  $6.7 \times 10^{-3}$  moles m<sup>2</sup> day<sup>-1</sup> 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  $-5.1 \times 10^{-3}$  moles m<sup>2</sup> day<sup>-1</sup> 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  $2.7 \times 10^{-3}$  moles m<sup>2</sup> day<sup>-1</sup> 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  $-1.5 \times 10^{-3}$  moles m<sup>2</sup> day<sup>-1</sup> 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.

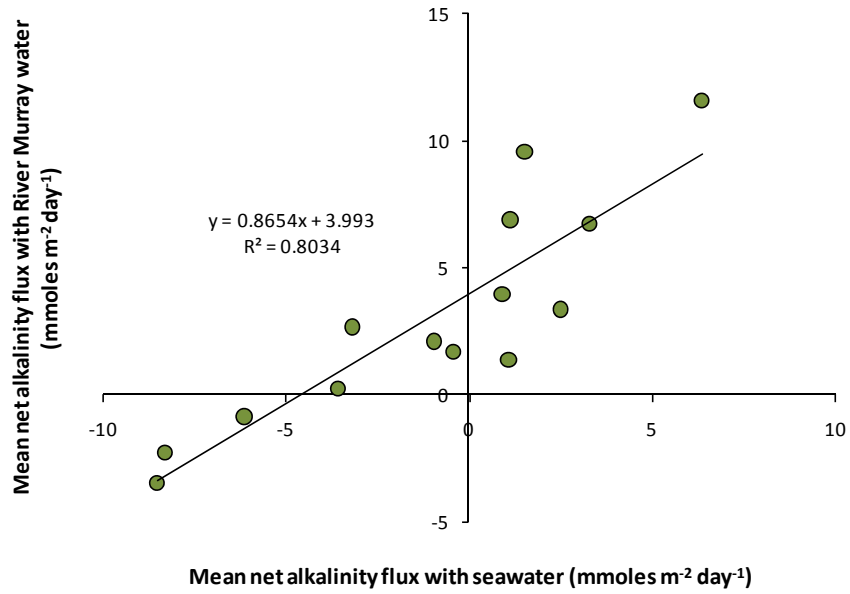


Figure 5-172. Comparison of the mean apparent net alkalinity flux for each site over 136 days of inundation using different water.

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<sub>i</sub> = apparent net diffusion rate of constituent *i* in moles m<sup>-2</sup> day<sup>-1</sup>.

ΔC<sub>i</sub> = change in concentration (g/l) of constituent *i* over d days.

M<sub>i</sub> = 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.**

Site	Mean Alkalinity Diffusion Rate		Maximum Alkalinity Diffusion Rate	
	River Murray	Seawater	River Murray	Seawater
	moles m <sup>-2</sup> day <sup>-1</sup>		moles m <sup>-2</sup> day <sup>-1</sup>	
1	9.58 x10 <sup>-3</sup>	1.53 x10 <sup>-3</sup>	80.84 x10 <sup>-3</sup>	308.03 x10 <sup>-3</sup>
2	6.73 x10 <sup>-3</sup>	3.29 x10 <sup>-3</sup>	44.06 x10 <sup>-3</sup>	475.96 x10 <sup>-3</sup>
3	1.39 x10 <sup>-3</sup>	1.10 x10 <sup>-3</sup>	30.75 x10 <sup>-3</sup>	230.32 x10 <sup>-3</sup>
4	3.38 x10 <sup>-3</sup>	2.53 x10 <sup>-3</sup>	40.39 x10 <sup>-3</sup>	184.57 x10 <sup>-3</sup>
5	2.12 x10 <sup>-3</sup>	-0.95 x10 <sup>-3</sup>	30.18 x10 <sup>-3</sup>	168.58 x10 <sup>-3</sup>
6	2.67 x10 <sup>-3</sup>	-3.17 x10 <sup>-3</sup>	34.19 x10 <sup>-3</sup>	97.65 x10 <sup>-3</sup>
7	-0.85 x10 <sup>-3</sup>	-6.14 x10 <sup>-3</sup>	25.19 x10 <sup>-3</sup>	111.23 x10 <sup>-3</sup>
8	-2.25 x10 <sup>-3</sup>	-8.29 x10 <sup>-3</sup>	24.98 x10 <sup>-3</sup>	36.66 x10 <sup>-3</sup>
9	1.69 x10 <sup>-3</sup>	-0.41 x10 <sup>-3</sup>	32.99 x10 <sup>-3</sup>	88.09 x10 <sup>-3</sup>
10	0.24 x10 <sup>-3</sup>	-3.56 x10 <sup>-3</sup>	34.58 x10 <sup>-3</sup>	42.82 x10 <sup>-3</sup>
11	6.90 x10 <sup>-3</sup>	1.14 x10 <sup>-3</sup>	68.23 x10 <sup>-3</sup>	66.01 x10 <sup>-3</sup>
12	11.57 x10 <sup>-3</sup>	6.37 x10 <sup>-3</sup>	120.53 x10 <sup>-3</sup>	124.65 x10 <sup>-3</sup>
13	-3.44 x10 <sup>-3</sup>	-8.51 x10 <sup>-3</sup>	26.33 x10 <sup>-3</sup>	11.02 x10 <sup>-3</sup>
14	-3.44 x10 <sup>-3</sup>	-8.51 x10 <sup>-3</sup>	88.10 x10 <sup>-3</sup>	0.19 x10 <sup>-3</sup>
15	3.97 x10 <sup>-3</sup>	0.92 x10 <sup>-3</sup>	77.92 x10 <sup>-3</sup>	48.51 x10 <sup>-3</sup>

**Table 5-21. Maximum apparent net diffusion rates during the incubation for selected constituents (NO<sub>3</sub><sup>-</sup>, NH<sub>3</sub>, Ni).**



	NO <sub>3</sub> <sup>-</sup>		NH <sub>3</sub>		Ni	
	River Murray	Seawater	River Murray	Seawater	River Murray	Seawater
Site	moles m <sup>-2</sup> day <sup>-1</sup>		moles m <sup>-2</sup> day <sup>-1</sup>		moles m <sup>-2</sup> day <sup>-1</sup>	
1	2.59 x10 <sup>-3</sup>	2.60 x10 <sup>-3</sup>	7.61 x10 <sup>-3</sup>	15.29 x10 <sup>-3</sup>	2.68 x10 <sup>-6</sup>	4.41 x10 <sup>-6</sup>
2	0.71 x10 <sup>-3</sup>	2.43 x10 <sup>-3</sup>	2.21 x10 <sup>-3</sup>	1.07 x10 <sup>-3</sup>	0.81 x10 <sup>-6</sup>	3.62 x10 <sup>-6</sup>
3	1.12 x10 <sup>-3</sup>	0.25 x10 <sup>-3</sup>	3.57 x10 <sup>-3</sup>	1.10 x10 <sup>-3</sup>	1.62 x10 <sup>-6</sup>	6.22 x10 <sup>-6</sup>
4	0.83 x10 <sup>-3</sup>	1.24 x10 <sup>-3</sup>	3.89 x10 <sup>-3</sup>	2.87 x10 <sup>-3</sup>	1.14 x10 <sup>-6</sup>	2.12 x10 <sup>-6</sup>
5	0.68 x10 <sup>-3</sup>	8.53 x10 <sup>-3</sup>	2.89 x10 <sup>-3</sup>	1.13 x10 <sup>-3</sup>	1.70 x10 <sup>-6</sup>	30.08 x10 <sup>-6</sup>
6	1.26 x10 <sup>-3</sup>	1.28 x10 <sup>-3</sup>	3.36 x10 <sup>-3</sup>	2.43 x10 <sup>-3</sup>	0.88 x10 <sup>-6</sup>	87.91 x10 <sup>-6</sup>
7	0.80 x10 <sup>-3</sup>	0.38 x10 <sup>-3</sup>	3.43 x10 <sup>-3</sup>	2.12 x10 <sup>-3</sup>	1.21 x10 <sup>-6</sup>	17.67 x10 <sup>-6</sup>
8	1.42 x10 <sup>-3</sup>	0.11 x10 <sup>-3</sup>	3.46 x10 <sup>-3</sup>	5.74 x10 <sup>-3</sup>	1.66 x10 <sup>-6</sup>	13.41 x10 <sup>-6</sup>
9	0.71 x10 <sup>-3</sup>	3.99 x10 <sup>-3</sup>	2.79 x10 <sup>-3</sup>	0.99 x10 <sup>-3</sup>	0.51 x10 <sup>-6</sup>	3.81 x10 <sup>-6</sup>
10	3.35 x10 <sup>-3</sup>	13.48 x10 <sup>-3</sup>	4.29 x10 <sup>-3</sup>	19.59 x10 <sup>-3</sup>	0.24 x10 <sup>-6</sup>	43.70 x10 <sup>-6</sup>
11	0.94 x10 <sup>-3</sup>	14.43 x10 <sup>-3</sup>	3.39 x10 <sup>-3</sup>	0.72 x10 <sup>-3</sup>	0.51 x10 <sup>-6</sup>	6.25 x10 <sup>-6</sup>
12	0.99 x10 <sup>-3</sup>	2.74 x10 <sup>-3</sup>	8.71 x10 <sup>-3</sup>	8.12 x10 <sup>-3</sup>	0.96 x10 <sup>-6</sup>	2.55 x10 <sup>-6</sup>
13	0.63 x10 <sup>-3</sup>	0.26 x10 <sup>-3</sup>	3.36 x10 <sup>-3</sup>	2.63 x10 <sup>-3</sup>	2.38 x10 <sup>-6</sup>	30.96 x10 <sup>-6</sup>
14	1.21 x10 <sup>-3</sup>	0.50 x10 <sup>-3</sup>	3.61 x10 <sup>-3</sup>	6.54 x10 <sup>-3</sup>	2.10 x10 <sup>-6</sup>	13.16 x10 <sup>-6</sup>
15	0.60 x10 <sup>-3</sup>	0.93 x10 <sup>-3</sup>	2.57 x10 <sup>-3</sup>	1.91 x10 <sup>-3</sup>	2.12 x10 <sup>-6</sup>	6.26 x10 <sup>-6</sup>

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

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 <sup>-2</sup> day <sup>-1</sup>		moles m <sup>-2</sup> day <sup>-1</sup>		moles m <sup>-2</sup> day <sup>-1</sup>	
1	43.81 x10 <sup>-6</sup>	34.15 x10 <sup>-6</sup>	0.63 x10 <sup>-6</sup>	2.02 x10 <sup>-6</sup>	0.72 x10 <sup>-6</sup>	2.59 x10 <sup>-6</sup>
2	52.45 x10 <sup>-6</sup>	18.16 x10 <sup>-6</sup>	0.96 x10 <sup>-6</sup>	3.57 x10 <sup>-6</sup>	0.06 x10 <sup>-6</sup>	1.13 x10 <sup>-6</sup>
3	88.57 x10 <sup>-6</sup>	37.98 x10 <sup>-6</sup>	1.83 x10 <sup>-6</sup>	1.19 x10 <sup>-6</sup>	0.56 x10 <sup>-6</sup>	0.35 x10 <sup>-6</sup>
4	23.04 x10 <sup>-6</sup>	18.57 x10 <sup>-6</sup>	2.00 x10 <sup>-6</sup>	2.16 x10 <sup>-6</sup>	0.28 x10 <sup>-6</sup>	0.22 x10 <sup>-6</sup>
5	43.62 x10 <sup>-6</sup>	21.86 x10 <sup>-6</sup>	1.56 x10 <sup>-6</sup>	0.76 x10 <sup>-6</sup>	0.13 x10 <sup>-6</sup>	6.70 x10 <sup>-6</sup>
6	49.85 x10 <sup>-6</sup>	142.52 x10 <sup>-6</sup>	1.93 x10 <sup>-6</sup>	1.16 x10 <sup>-6</sup>	0.06 x10 <sup>-6</sup>	63.26 x10 <sup>-6</sup>
7	31.77 x10 <sup>-6</sup>	62.28 x10 <sup>-6</sup>	2.96 x10 <sup>-6</sup>	2.02 x10 <sup>-6</sup>	0.03 x10 <sup>-6</sup>	9.44 x10 <sup>-6</sup>
8	47.37 x10 <sup>-6</sup>	72.40 x10 <sup>-6</sup>	3.70 x10 <sup>-6</sup>	1.55 x10 <sup>-6</sup>	1.17 x10 <sup>-6</sup>	7.86 x10 <sup>-6</sup>
9	26.27 x10 <sup>-6</sup>	19.27 x10 <sup>-6</sup>	1.57 x10 <sup>-6</sup>	1.55 x10 <sup>-6</sup>	0.22 x10 <sup>-6</sup>	0.39 x10 <sup>-6</sup>
10	44.83 x10 <sup>-6</sup>	42.40 x10 <sup>-6</sup>	0.74 x10 <sup>-6</sup>	1.65 x10 <sup>-6</sup>	0.07 x10 <sup>-6</sup>	24.99 x10 <sup>-6</sup>
11	37.95 x10 <sup>-6</sup>	23.57 x10 <sup>-6</sup>	1.32 x10 <sup>-6</sup>	0.77 x10 <sup>-6</sup>	1.50 x10 <sup>-6</sup>	2.45 x10 <sup>-6</sup>
12	37.81 x10 <sup>-6</sup>	14.04 x10 <sup>-6</sup>	1.89 x10 <sup>-6</sup>	2.14 x10 <sup>-6</sup>	0.16 x10 <sup>-6</sup>	0.51 x10 <sup>-6</sup>
13	85.95 x10 <sup>-6</sup>	47.50 x10 <sup>-6</sup>	1.27 x10 <sup>-6</sup>	0.57 x10 <sup>-6</sup>	0.65 x10 <sup>-6</sup>	11.73 x10 <sup>-6</sup>
14	74.54 x10 <sup>-6</sup>	92.00 x10 <sup>-6</sup>	1.08 x10 <sup>-6</sup>	1.62 x10 <sup>-6</sup>	1.98 x10 <sup>-6</sup>	13.39 x10 <sup>-6</sup>
15	32.16 x10 <sup>-6</sup>	53.79 x10 <sup>-6</sup>	0.84 x10 <sup>-6</sup>	0.89 x10 <sup>-6</sup>	0.24 x10 <sup>-6</sup>	3.67 x10 <sup>-6</sup>

#### 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 <sub>3</sub> 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 <sub>3</sub> in the pore-waters suggest that the increase of NH <sub>3</sub> in the inundating waters was via upwards diffusion.	NH <sub>3</sub> concentrations are below the appropriate ANZECC trigger values for both treatments. The concentrations of NH <sub>3</sub> in the pore-waters (0.2 m bgl*) suggest that the increase of NH <sub>3</sub> 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 <sub>4</sub> 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  $6.7 \times 10^{-3}$  moles  $\text{m}^2 \text{day}^{-1}$  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  $-5.1 \times 10^{-3}$  moles  $\text{m}^2 \text{day}^{-1}$  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  $2.7 \times 10^{-3}$  moles  $\text{m}^2 \text{day}^{-1}$  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  $-1.5 \times 10^{-3}$  moles  $\text{m}^2 \text{day}^{-1}$  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  $\text{H}^+$ /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  $^{35}\text{SO}_4^{2-}$  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  $\text{NH}_3$  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  $\text{NH}_3$  when seawater was used. The inundating waters for site 12 also exceeded the recommended water quality guidelines for  $\text{NH}_3$  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.

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## 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. <b>0-5 cm:</b> Brown/grey sand with dark grey crust (pH 7.80, EC 1609 $\mu$ S/cm). <b>5-12 cm:</b> Grey sand with frequent large orange mottles (pH 4.86, EC 1296 $\mu$ S/cm). <b>12-30 cm:</b> Grey sandy clay (pH 6.32, EC 632 $\mu$ S/cm). <b>30-45 cm:</b> Dark grey light clay (pH 8.24, EC 418 $\mu$ S/cm).
Site 2	12/06/09	Waltowa, Lake Albert	54 0352339 6059063	Sampling site at 112 m from former shoreline. <b>0-5 cm:</b> Pale brown sand (pH 8.79, EC 434 $\mu$ S/cm). <b>5-10 cm:</b> Orange mottled pale brown sand (pH 8.32, EC 948 $\mu$ S/cm). <b>10-20 cm:</b> Mottled orange & dark grey/pale brown sand. (pH 8.27, EC 1073 $\mu$ S/cm). <b>20-45 cm:</b> Dark grey sand with orange mottles (pH 8.40, EC 432 $\mu$ S/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. <b>0-1 cm:</b> Orange sand crust with white surface (pH 7.48, EC 7.68 mS/cm). <b>1-15 cm:</b> White sand and dark grey clay alternating layers each ~3 cm thick (pH 7.66, EC 6.98 mS/cm). <b>15-27 cm:</b> Grey with frequent orange mottles (pH 7.74, EC 4.99 mS/cm). <b>27-41 cm:</b> Grey sand with a few orange mottles and frequent roots (pH 7.55, EC 10.70 mS/cm). <b>41-50 cm:</b> 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. <b>0-11 cm:</b> Pale brown sand with some orange segregations (pH 7.59, EC 2317 $\mu$ S/cm). <b>11-15 cm:</b> Pale brown sand with frequent grey and orange bands (pH 6.71, EC 4.81 mS/cm). <b>15-40 cm:</b> 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 Zone East. North.	Location and Profile Remarks
Site 5	13/06/09	Tolderol, Lake Alexandrina	54 0325277 6081731	<p>Sampling site at 134 m from former shoreline.</p> <p><b>0-5 cm:</b> Pale brown sand with abundant diffuse orange segregations (pH 5.56, EC 113 <math>\mu\text{S/cm}</math>).</p> <p><b>5-15 cm:</b> Pale brown sand with occasional orange segregations (pH 5.61, EC 162 <math>\mu\text{S/cm}</math>).</p> <p><b>15-19 cm:</b> Light grey/pale brown sand (pH 3.80, EC 1939 <math>\mu\text{S/cm}</math>).</p> <p>The boundary between these layers consists of strong orange segregations.</p> <p><b>19-25 cm:</b> Grey light clay (pH 5.64, EC 1401 <math>\mu\text{S/cm}</math>).</p> <p><b>25-40 cm:</b> Dark grey light medium clay (pH 6.82, EC 910 <math>\mu\text{S/cm}</math>).</p>
Site 6	13/06/09	Tolderol, Lake Alexandrina	54 0325244 6081611	<p>Sampling site at 266 m from former shoreline.</p> <p><b>0-7 cm:</b> Pale brown sand with abundant diffuse orange segregations (pH 6.43, EC 114 <math>\mu\text{S/cm}</math>).</p> <p><b>7-18 cm:</b> Pale brown sand with occasional orange segregations (pH 3.52, EC 567 <math>\mu\text{S/cm}</math>).</p> <p><b>18-32 cm:</b> Light grey/pale brown sand (pH 4.03, EC 773 <math>\mu\text{S/cm}</math>).</p> <p>The boundary between these layers consists of strong orange segregations.</p> <p><b>32-38 cm:</b> Grey light clay (pH 6.92, EC 408 <math>\mu\text{S/cm}</math>).</p> <p><b>38-45 cm:</b> Dark grey light medium clay (pH 9.02, EC 158 <math>\mu\text{S/cm}</math>).</p>
Site 7	14/06/09	Point Sturt (South), Lake Alexandrina	54 0314804 6069665	<p>Sampling site at 124 m from former shoreline.</p> <p><b>0-5 cm:</b> Pale brown sand with abundant orange segregations (pH 3.63, EC 232 <math>\mu\text{S/cm}</math>).</p> <p><b>5-11 cm:</b> Light grey sand with some orange segregations (pH 3.56, EC 315 <math>\mu\text{S/cm}</math>).</p> <p><b>11-26 cm:</b> Light grey and dark grey layers intermixed sand (pH 3.18, EC 1186 <math>\mu\text{S/cm}</math>).</p> <p><b>26-41 cm:</b> Darker grey sandy clay and light grey sand (pH 3.17, EC 2136 <math>\mu\text{S/cm}</math>).</p> <p><b>41-55 cm:</b> Darker grey sandy clay (pH 5.60, EC 1112 <math>\mu\text{S/cm}</math>).</p>

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

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

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

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

## 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	<b>6.03 (1173)</b>	6.82 (861)	6.05 (790)	6.26 (580)	6.74 (1432)

Note: EC data is in brackets ( $\mu\text{S}/\text{cm}$ ). 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)	<b>8.40 (869)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>7.84 (5.05)</b>	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	<b>6.39 (1447)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>6.11 (184)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>4.20 (150)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>3.40 (690)</b>	3.41 (729)

Note: EC data is in brackets ( $\mu\text{S}/\text{cm}$ ). 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)	<b>3.68 (366)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>7.30 (37.3)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>4.24 (470)</b>
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 ( $\mu\text{S}/\text{cm}$ ). 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	<b>6.74 (606)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>3.21 (2022)</b>	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 ( $\mu\text{S}/\text{cm}$ ). 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)	<b>2.93 (1565)</b>	2.78 (2325)	2.89 (2072)

Note: EC data is in brackets ( $\mu\text{S}/\text{cm}$ ). 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	<b>7.40 (827)</b>	7.53 (373)	7.43 (1763)	8.05 (605)	7.91 (741)

Note: EC data is in brackets ( $\mu\text{S}/\text{cm}$ ). 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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
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)).

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		200						1.5					
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
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	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
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	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
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	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
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	7	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	7	673	167	696	86	484	63
Seawater	0-4	142	7	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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /l)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	0.07	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	0.07	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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /l)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.											
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
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)).

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		200						1.5					
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
River Murray	0-4	1.47	0.25	1.76	0.49	1.11	0.21
	4-8	2.19	1.94	1.39	0.72	1.07	0.04
	8-15	1.81	0.97	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	0.97	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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	57	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	67	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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
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)).

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		200						1.5					
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	<0.001	-	<0.001	-	<0.001	-	0.082	0.009	0.445	0.195	0.190	0.200
	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
Seawater	0-4	<0.001	-	<0.001	-	<0.001	-	0.082	0.009	5.618	1.613	3.329	0.012
	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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	1.11	0.19	2.43	1.23	0.30	0.59	0.03	0.06	0.06	0.09	0.00	-
	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	-
Seawater	0-4	1.11	0.19	0.00	-	0.00	-	0.03	0.06	0.05	0.09	0.02	0.04
	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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	0.05	0.01	0.07	0.04	0.04	<0.01	0.02	0.02	<0.01	-	0.01	0.01
	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
Seawater	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
	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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	-
	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
Seawater	0-4	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	0.03	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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	30	6	159	84	76	75	13.8	0.3	21.5	0.6	6.1	2.4
	4-8	57	7	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
Seawater	0-4	30	6	2334	565	2370	109	13.8	0.3	96.0	20.7	97.2	11.6
	4-8	57	7	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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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	7	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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	7	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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	
		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	
		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	0.37	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	
		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	
		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.											
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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	7	3	35	7	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	7	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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	17	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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						n.a.					
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
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)).

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		200						1.5					
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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	<i>0.04</i>	1.46	<i>0.62</i>	0.94	<i>0.45</i>
	4-8	1.09	<i>0.13</i>	1.19	<i>0.28</i>	1.00	<i>0.27</i>
	8-15	0.79	<i>0.15</i>	0.94	<i>0.07</i>	0.86	<i>0.66</i>
Seawater	0-4	0.84	<i>0.04</i>	0.96	<i>0.07</i>	0.94	<i>0.32</i>
	4-8	1.09	<i>0.13</i>	1.28	<i>0.68</i>	0.91	<i>0.39</i>
	8-15	0.79	<i>0.15</i>	0.94	<i>0.35</i>	0.59	<i>0.07</i>

\* 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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	<0.01	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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	116	24	153	38	84	12	140	30	106	44	59	18
	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
Seawater	0-4	116	24	2745	379	3906	2005	140	30	557	48	568	225
	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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.											
River Murray	0-4	488	32	523	20	378	16	475	38	517	83	473	30
	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
Seawater	0-4	488	32	423	26	368	34	475	38	456	55	588	87
	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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
River Murray	0-4	5.1	0.1	5.6	0.6	3.9	0.4	0.48	0.08	0.16	0.10	<0.01	-
	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
Seawater	0-4	5.1	0.1	3.7	1.1	9.0	1.8	0.48	0.08	0.25	0.04	<0.01	-
	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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
River Murray	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
	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
Seawater	0-4	0.69	0.25	0.86	0.34	1.09	0.87	0.60	0.06	0.52	0.16	1.85	-
	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	7	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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
River Murray	0-4	106	30	81	7	69	7	21.9	0.7	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	8.7	30.1	1.0	11.5	0.2
Seawater	0-4	106	30	1802	52	1615	539	21.9	0.7	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	8.7	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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.											
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)).

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						20					
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)).

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		65						21					
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)).

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		200						1.5					
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	0.07	<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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	0.07	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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.											
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.											
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											
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											
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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	13.7	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	13.7	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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.											
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.											
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											
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											
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.											
ISQG-Low*		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	0.07	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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	
		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	
		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	1.7	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	1.7	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	
		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	
		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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	di-sulfide (%S)						monosulfide (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	elemental sulfur (%S)						EC (mS/cm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	TAA (mol H <sup>+</sup> /t)						ANC (%CaCO <sub>3</sub> )					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total C (%C)						Organic C (%C)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Total N (%N)						Total S (%S)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>+</sup> and K<sup>+</sup>.

Treatment	Depth (cm)	Na <sup>+</sup> (ppm)						K <sup>+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>2+</sup> and Mg<sup>2+</sup>.

Treatment	Depth (cm)	Ca <sup>2+</sup> (ppm)						Mg <sup>2+</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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<sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

Treatment	Depth (cm)	Cl <sup>-</sup> (ppm)						SO <sub>4</sub> <sup>2-</sup> (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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	
		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	
		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	
		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	0.07	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	0.07	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	
		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)).

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
ISQG-Low*		n.a.						80					
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	0.07	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	0.07	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)).

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		Av.	±	Av.	±	Av.	±
ISQG-Low*		50					
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.

Treatment	Depth (cm)	Al (ppm)						Fe (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Mn (ppm)						As (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Cu (ppm)						Ni (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Zn (ppm)						Cd (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Co (ppm)						Cr (ppm)					
		Day 0		Day 35		Day 136		Day 0		Day 35		Day 136	
		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.

Treatment	Depth (cm)	Pb (ppm)					
		Day 0		Day 35		Day 136	
		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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.065	<i>0.030</i>	0.010	<i>&lt;0.005</i>	0.035	<i>0.010</i>	0.040	<i>&lt;0.005</i>
4	0.060	<i>0.040</i>	0.050	<i>0.080</i>	0.030	<i>&lt;0.005</i>	0.050	<i>0.020</i>
7	0.155	<i>0.050</i>	0.140	<i>0.200</i>	0.040	<i>0.060</i>	0.115	<i>0.010</i>
11	0.260	<i>0.180</i>	0.405	<i>0.170</i>	0.185	<i>0.310</i>	0.205	<i>0.230</i>
18	1.105	<i>0.090</i>	0.730	<i>0.280</i>	0.475	<i>0.910</i>	0.635	<i>0.730</i>
25	1.285	<i>0.290</i>	1.580	<i>1.000</i>	<0.005	-	0.120	<i>0.200</i>
35	0.970	<i>0.260</i>	1.315	<i>0.010</i>	<0.005	-	<0.005	-
136	0.640	<i>0.080</i>	1.745	<i>0.130</i>	<0.005	-	0.005	<i>0.010</i>

Table 9-324. Selected nutrients in the pore-water (3-5 cm) after inundation of the Waltowa soil material (Site 1): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	1.340	<i>2.440</i>	0.475	<i>0.330</i>	0.705	<i>1.030</i>	0.480	<i>0.140</i>
4	0.030	<i>&lt;0.005</i>	0.030	<i>0.020</i>	0.010	<i>&lt;0.005</i>	0.025	<i>0.030</i>
7	0.150	<i>0.100</i>	0.110	<i>0.060</i>	0.020	<i>0.020</i>	0.085	<i>0.030</i>
11	0.265	<i>0.290</i>	0.195	<i>0.170</i>	0.020	<i>0.020</i>	0.110	<i>0.200</i>
18	0.425	<i>0.630</i>	0.235	<i>0.250</i>	0.370	<i>0.600</i>	0.260	<i>0.260</i>
25	0.800	<i>0.920</i>	0.420	<i>0.380</i>	0.045	<i>0.050</i>	0.140	<i>0.060</i>
35	0.615	<i>0.730</i>	0.495	<i>0.090</i>	0.065	<i>0.090</i>	0.045	<i>0.050</i>
136	0.235	<i>0.430</i>	0.640	<i>0.100</i>	0.070	<i>0.060</i>	0.040	<i>0.020</i>

Table 9-325. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	1.065	<i>0.470</i>	0.025	<i>0.030</i>	0.190	<i>0.080</i>	0.065	<i>0.050</i>
4	0.080	<i>0.160</i>	1.625	<i>3.250</i>	0.050	<i>0.040</i>	0.110	<i>0.060</i>
7	0.085	<i>0.070</i>	0.085	<i>0.010</i>	0.085	<i>0.090</i>	0.130	<i>0.040</i>
11	0.240	<i>0.060</i>	0.200	<i>0.040</i>	0.175	<i>0.010</i>	0.165	<i>0.010</i>
18	0.105	<i>0.110</i>	0.120	<i>0.100</i>	0.550	<i>0.120</i>	0.230	<i>0.140</i>
25	0.490	<i>0.160</i>	0.185	<i>0.030</i>	0.535	<i>0.190</i>	0.200	<i>0.120</i>
35	0.455	<i>0.130</i>	0.265	<i>0.030</i>	0.360	<i>0.140</i>	0.070	<i>0.080</i>
136	<0.005	-	0.140	<i>0.060</i>	0.345	<i>0.090</i>	0.045	<i>0.010</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>6.305</b>	11.610
25	0.130	<0.005	0.075	0.030	0.080	<0.005	<b>3.250</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>4.505</b>	5.610
4	0.410	0.340	0.110	<0.005	<b>2.715</b>	0.230	<b>2.285</b>	1.130
7	0.795	1.350	0.100	0.060	<b>3.450</b>	0.960	<b>3.310</b>	1.280
11	1.455	2.450	0.210	0.380	<b>3.080</b>	1.880	<b>3.215</b>	4.130
18	1.920	2.480	0.380	0.500	<b>3.030</b>	3.480	<b>3.860</b>	0.720
25	1.050	1.440	0.230	0.160	<b>2.845</b>	4.650	<b>3.815</b>	0.670
35	0.455	0.350	0.145	0.190	<b>2.860</b>	4.980	<b>2.905</b>	1.310
136	0.060	0.080	0.085	0.030	<b>5.530</b>	5.500	<b>2.905</b>	0.810

Table 9-328. Selected nutrients in the pore-water (10-12 cm) after inundation of the Waltowa soil material (Site 1): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>1.850</b>	0.440
7	0.080	0.040	0.145	0.070	<b>3.415</b>	0.190	<b>2.560</b>	0.520
11	0.265	0.030	0.350	0.020	<b>4.910</b>	1.260	<b>3.915</b>	0.990
18	0.390	0.120	0.285	0.150	<b>6.710</b>	2.300	<b>4.590</b>	1.840
25	0.510	0.200	0.300	0.140	<b>7.255</b>	2.110	<b>5.570</b>	1.320
35	0.340	0.160	0.070	0.040	<b>8.095</b>	0.650	<b>4.770</b>	0.620
136	0.315	0.090	0.060	0.020	<b>12.215</b>	0.450	<b>4.375</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<b>5.42</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	1.09	2.17	<0.01	-	5.59	10.91	18.62	25.44	<b>9.62</b>	16.01	13.05	2.10
4	0.74	1.43	0.01	<0.01	30.21	27.67	45.69	22.02	<b>10.63</b>	13.46	12.85	3.83
7	0.19	0.36	0.01	<0.01	53.82	28.12	52.25	5.17	<b>11.22</b>	12.73	15.45	5.69
11	0.02	0.03	0.02	0.01	100.94	31.70	55.90	1.11	<b>12.94</b>	12.83	16.09	11.08
18	<0.01	-	0.07	0.14	177.22	125.06	60.54	8.41	<b>14.15</b>	17.04	12.98	9.72
25	<0.01	-	<0.01	-	149.10	69.58	67.64	8.44	<b>10.18</b>	9.29	11.46	7.35
35	0.01	<0.01	0.01	0.01	159.45	67.61	61.99	10.84	<b>10.69</b>	10.55	9.35	6.58
136	0.03	0.05	<0.01	-	82.74	27.80	36.82	16.94	<b>6.45</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	11.37	0.66	28.89	29.32	6.50	0.30	<1.0	-	<b>147.21</b>	238.60	32.05	15.03
4	19.10	6.52	60.49	15.34	4.24	1.52	2.50	0.62	<b>141.76</b>	214.29	23.11	22.56
7	29.63	12.60	68.97	9.06	2.39	2.02	4.10	0.81	<b>121.18</b>	161.04	24.06	25.54
11	50.15	19.09	76.09	7.54	2.65	1.38	3.47	0.52	<b>91.60</b>	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	-	<b>9.18</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>86.17</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	-	<b>71.46</b>	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	<b>48.89</b>	-	<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	-	<b>82.58</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	104.53	122.76	<b>51.56</b>	32.86	1.12	1.51	0.25	<0.1	118.17	214.95	48.51	24.64
4	<b>200.57</b>	219.13	<b>74.79</b>	66.53	0.73	0.77	0.21	0.16	122.73	183.92	49.64	18.33
7	86.85	69.85	<b>122.24</b>	65.52	0.54	0.54	0.18	0.16	137.41	178.93	59.02	12.49
11	78.90	29.49	<b>85.25</b>	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	<b>56.34</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	1.88	<b>3.62</b>
4	1.32	<b>0.44</b>	<4.4	-	<1.0	-	<1.0	-
7	1.65	-	<4.4	-	<1.0	-	<1.0	-
11	1.73	<b>0.30</b>	<4.4	-	<1.0	-	<1.0	-
18	1.78	<b>0.55</b>	<4.4	-	1.52	<b>2.88</b>	<1.0	-
25	2.08	<b>1.14</b>	<4.4	-	<1.0	-	<1.0	-
35	2.38	<b>1.21</b>	<4.4	-	<1.0	-	<1.0	-
136	2.76	<b>2.02</b>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	2.29	<b>1.10</b>	<4.4	-	<1.0	-	<1.0	-
4	2.22	<b>1.05</b>	<4.4	-	<1.0	-	<1.0	-
7	2.06	<b>0.68</b>	<4.4	-	<1.0	-	<1.0	-
11	2.98	<b>2.12</b>	<4.4	-	<1.0	-	<1.0	-
18	3.02	<b>1.70</b>	<4.4	-	<1.0	-	<1.0	-
25	2.16	<b>0.50</b>	<4.4	-	<1.0	-	<1.0	-
35	2.64	<b>1.13</b>	<4.4	-	<1.0	-	<1.0	-
136	3.20	<b>1.16</b>	4.80	<b>0.28</b>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.96	<b>1.41</b>	<4.4	-	1.49	<b>1.04</b>	<1.0	-
4	1.62	<b>2.92</b>	<4.4	-	1.68	<b>1.01</b>	<1.0	-
7	1.60	<b>0.98</b>	<4.4	-	1.06	<b>&lt;1.0</b>	<1.0	-
11	2.67	<b>0.49</b>	<4.4	-	<1.0	-	<1.0	-
18	2.12	<b>0.15</b>	<4.4	-	<1.0	-	1.05	<b>1.20</b>
25	2.39	<b>0.79</b>	<4.4	-	<1.0	-	<1.0	-
35	3.49	<b>1.56</b>	<4.4	-	<1.0	-	<1.0	-
136	2.94	<b>0.08</b>	6.01	<b>2.50</b>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	3.78	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
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	-	<b>46.16</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
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	<b>45.99</b>	3.71	<0.1	-	0.14	<0.1	<1.0	-	<1.0	-
7	45.41	14.86	<b>48.13</b>	24.93	0.13	0.16	0.18	0.11	<1.0	-	<1.0	-
11	41.35	15.97	<b>50.35</b>	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	<b>84.64</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
0.08	33.00	27.39	<b>65.71</b>	48.84	<0.1	-	<0.1	-	6.15	10.45	2.52	3.94
4	145.69	109.13	<b>53.13</b>	5.66	0.18	0.15	0.51	0.53	9.63	15.90	9.31	17.14
7	49.43	12.17	<b>54.16</b>	3.68	0.16	<0.1	0.41	0.13	9.51	14.58	9.14	12.44
11	79.04	30.54	<b>74.70</b>	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	<b>106.37</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.47	<i>0.44</i>	<4.4	-	1.10	<i>2.19</i>	<1.0	-
7	1.65	<i>0.61</i>	<4.4	-	<1.0	-	1.39	<i>1.78</i>
11	2.04	<i>0.10</i>	<4.4	-	<1.0	-	<1.0	-
18	1.64	<i>0.31</i>	<4.4	-	<1.0	-	<1.0	-
25	2.70	<i>0.19</i>	5.70	<i>4.50</i>	<1.0	-	<1.0	-
35	2.99	<i>2.51</i>	<4.4	-	<1.0	-	<1.0	-
136	1.64	<i>0.35</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.36	<i>0.84</i>	<4.4	-	<1.0	-	<1.0	-
4	1.95	<i>0.03</i>	<4.4	-	<1.0	-	<1.0	-
7	1.44	<i>0.60</i>	<4.4	-	<1.0	-	<1.0	-
11	2.32	<i>0.39</i>	<4.4	-	<1.0	-	<1.0	-
18	1.84	<i>0.20</i>	<4.4	-	<1.0	-	1.54	<1.0
25	2.76	<i>0.77</i>	<4.4	-	<1.0	-	<1.0	-
35	2.02	<i>0.13</i>	<4.4	-	<1.0	-	<1.0	-
136	1.92	<i>0.02</i>	4.57	<i>0.14</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	2.11	<i>0.21</i>	<4.4	-	<1.0	-	<1.0	-
4	2.20	<i>0.59</i>	<4.4	-	<1.0	-	<1.0	-
7	2.09	<i>0.18</i>	<4.4	-	<1.0	-	1.91	<i>2.78</i>
11	3.73	<i>0.11</i>	<4.4	-	<1.0	-	1.35	<i>1.68</i>
18	2.11	<i>0.49</i>	<4.4	-	1.89	<i>3.12</i>	<1.0	-
25	2.88	<i>0.71</i>	<4.4	-	<1.0	-	<1.0	-
35	2.42	<i>0.86</i>	<4.4	-	<1.0	-	<1.0	-
136	2.51	<i>0.23</i>	4.48	<i>0.44</i>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	115	3	9851	175	4.7	0.3	335.5	0.4	18.8	1.0	416.9	13.5
<b>4</b>	128	1	9755	489	6.2	<0.1	343.0	16.8	23.4	0.4	424.5	39.4
<b>7</b>	127	3	9674	580	6.5	0.3	328.4	19.6	26.1	1.4	433.1	29.5
<b>11</b>	124	15	10760	1705	6.4	0.5	337.9	54.6	27.2	2.2	454.8	75.8
<b>18</b>	133	22	8612	413	6.2	1.3	322.8	16.1	28.9	3.6	388.1	5.0
<b>25</b>	150	9	9461	987	6.6	1.2	362.3	45.3	30.9	2.9	434.7	20.3
<b>35</b>	145	56	9165	295	6.5	2.8	347.2	11.9	32.1	9.5	407.4	31.9
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	1474	670	5247	3537	50.1	12.5	170.6	135.0	107.8	56.8	285.8	120.1
<b>4</b>	874	546	8774	345	35.4	14.1	318.9	19.1	70.6	50.9	418.4	27.2
<b>7</b>	630	468	9134	515	27.6	13.0	307.6	12.6	56.1	43.1	443.1	31.2
<b>11</b>	444	431	11104	1644	19.7	13.2	347.3	31.7	41.2	34.4	490.3	67.6
<b>18</b>	372	495	8498	632	14.5	15.5	313.9	14.5	45.5	29.1	414.6	41.0
<b>25</b>	403	499	9512	789	14.5	14.8	350.7	28.1	48.6	19.3	459.3	64.3
<b>35</b>	329	387	9091	104	11.8	10.4	337.4	12.9	48.8	16.1	404.6	14.8
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	1721	545	1914	1088	53.0	1.9	61.3	42.0	177.6	83.5	133.3	7.6
<b>4</b>	1674	362	6701	1178	55.1	1.1	207.4	27.5	186.3	73.6	397.7	127.6
<b>7</b>	1579	501	8745	764	50.0	3.4	266.1	37.9	193.4	83.7	476.4	29.1
<b>11</b>	1491	494	9199	2	46.8	2.5	279.3	19.6	161.6	67.1	446.8	51.8
<b>18</b>	961	1288	7867	472	31.5	26.2	273.8	37.7	102.4	150.9	392.7	24.8
<b>25</b>	1019	1400	8261	620	31.0	28.3	298.3	18.7	103.7	151.4	425.2	8.4
<b>35</b>	874	939	8823	640	28.1	17.6	307.7	25.0	91.5	101.1	434.5	29.6
<b>136</b>	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.075	<i>0.010</i>	0.013	<i>0.005</i>	0.030	<i>&lt;0.005</i>	0.033	<i>0.005</i>
4	0.080	<i>&lt;0.005</i>	0.010	<i>0.020</i>	0.010	<i>&lt;0.005</i>	<i>&lt;0.005</i>	-
7	0.125	<i>0.030</i>	0.045	<i>0.030</i>	0.010	<i>&lt;0.005</i>	0.005	<i>0.010</i>
11	0.120	<i>&lt;0.005</i>	0.045	<i>0.010</i>	<i>&lt;0.005</i>	-	<i>&lt;0.005</i>	-
18	0.125	<i>0.030</i>	0.060	<i>0.020</i>	0.060	<i>0.080</i>	0.010	<i>&lt;0.005</i>
25	0.490	<i>0.120</i>	0.025	<i>0.050</i>	0.265	<i>0.050</i>	0.005	<i>0.010</i>
35	0.550	<i>0.120</i>	0.135	<i>0.030</i>	0.135	<i>0.250</i>	0.055	<i>0.010</i>
136	1.660	<i>2.680</i>	0.830	<i>0.040</i>	0.010	<i>&lt;0.005</i>	<i>&lt;0.005</i>	-

Table 9-384. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 3): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.325	<i>0.430</i>	0.029	<i>0.017</i>	0.100	<i>0.120</i>	0.037	<i>0.007</i>
4	0.008	<i>0.016</i>	0.015	<i>0.030</i>	0.007	<i>0.006</i>	0.010	<i>0.020</i>
7	0.045	<i>0.030</i>	0.085	<i>0.070</i>	0.010	<i>0.020</i>	0.035	<i>0.050</i>
11	0.055	<i>0.030</i>	0.080	<i>0.020</i>	0.005	<i>0.010</i>	0.010	<i>0.020</i>
18	0.025	<i>0.010</i>	0.070	<i>0.020</i>	0.040	<i>&lt;0.005</i>	0.045	<i>0.050</i>
25	0.200	<i>0.060</i>	0.090	<i>0.120</i>	0.050	<i>0.020</i>	0.045	<i>0.030</i>
35	0.165	<i>0.070</i>	0.435	<i>0.550</i>	0.060	<i>0.040</i>	0.055	<i>0.070</i>
136	0.040	<i>0.080</i>	0.105	<i>0.030</i>	0.030	<i>0.020</i>	0.015	<i>0.010</i>

Table 9-385. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 3): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.110	<i>0.201</i>	0.245	<i>0.350</i>	0.041	<i>0.019</i>	0.050	<i>&lt;0.005</i>
4	0.105	<i>0.170</i>	0.130	<i>0.200</i>	0.005	<i>0.010</i>	<i>&lt;0.005</i>	-
7	0.050	<i>0.020</i>	0.080	<i>0.020</i>	0.015	<i>0.030</i>	0.005	<i>0.010</i>
11	0.050	<i>&lt;0.005</i>	0.040	<i>0.000</i>	0.010	<i>0.020</i>	<i>&lt;0.005</i>	-
18	0.035	<i>0.010</i>	0.055	<i>0.090</i>	0.035	<i>0.050</i>	0.005	<i>0.010</i>
25	0.160	<i>&lt;0.005</i>	0.105	<i>0.090</i>	0.040	<i>0.060</i>	0.035	<i>0.050</i>
35	0.090	<i>0.060</i>	0.350	<i>0.260</i>	0.030	<i>0.020</i>	0.035	<i>0.070</i>
136	<i>&lt;0.005</i>	-	0.195	<i>0.030</i>	0.095	<i>0.030</i>	0.070	<i>0.020</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>2.075</b>	0.730
18	0.020	<0.005	0.050	0.040	<b>2.325</b>	0.090	<b>2.645</b>	0.350
25	0.035	0.010	0.060	0.020	2.255	0.230	<b>2.500</b>	0.560
35	0.045	0.010	0.060	0.020	1.775	0.050	<b>2.150</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>2.345</b>	0.750	1.325	0.770
25	0.040	0.040	0.035	0.010	2.035	0.090	<b>2.085</b>	0.910
35	0.030	<0.005	0.035	0.050	2.230	0.160	<b>1.980</b>	0.920
136	0.105	0.050	0.085	0.030	2.160	0.140	<b>1.890</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<b>7.57</b>	3.96	6.29	2.93
7	<0.01	-	0.05	0.05	3.15	5.14	6.56	6.76	<b>11.09</b>	0.43	12.31	4.14
11	<0.01	-	0.04	0.05	3.79	2.56	8.08	6.69	<b>12.75</b>	3.01	17.31	6.07
18	<0.01	-	<0.01	-	8.20	0.39	9.75	8.47	<b>11.37</b>	1.00	14.81	4.84
25	0.02	<0.01	<0.01	-	10.60	0.77	8.27	7.36	<b>10.52</b>	4.09	12.94	7.65
35	<0.01	-	<0.01	-	10.55	1.61	8.23	11.26	<b>9.92</b>	3.69	12.31	11.17
136	<0.01	-	<0.01	-	8.47	6.42	8.92	5.92	<b>6.52</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<b>4.44</b>	6.12	5.29	10.36
7	0.01	<0.01	0.06	0.07	2.84	4.13	1.30	2.33	<b>5.37</b>	4.24	7.49	13.05
11	<0.01	-	0.52	0.98	3.99	5.47	1.70	2.90	<b>7.25</b>	1.50	9.61	13.49
18	<0.01	-	0.01	<0.01	6.71	7.19	2.22	3.58	<b>8.26</b>	1.78	9.98	10.96
25	<0.01	-	0.01	<0.01	9.35	9.52	4.37	6.84	<b>10.77</b>	5.19	13.52	11.10
35	<0.01	-	<0.01	-	13.30	11.14	7.49	10.62	<b>12.51</b>	7.49	14.76	8.96
136	<0.01	-	<0.01	-	29.77	2.95	22.08	5.08	<b>8.83</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	-	<b>48.15</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	40.73	8.41	<b>53.53</b>	0.36	0.69	0.62	0.24	0.48	<1.0	-	6.19	1.07
4	96.81	91.92	<b>51.41</b>	24.15	<0.1	-	0.14	0.28	9.33	0.78	3.21	3.08
7	47.12	32.22	<b>44.19</b>	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	<b>58.90</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	68.31	4.72	<b>51.60</b>	9.21	0.50	1.00	0.50	1.00	21.21	2.50	5.16	10.32
4	122.62	5.77	<b>70.78</b>	24.50	<0.1	-	0.50	1.00	20.32	15.90	5.27	10.54
7	44.19	3.81	<b>96.59</b>	23.38	0.61	0.17	0.58	<0.1	23.99	9.44	9.23	16.54
11	58.21	14.37	<b>72.74</b>	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	<b>47.55</b>	4.55	0.26	<0.1	0.25	0.14	23.65	22.79	12.05	5.18
35	52.03	5.00	<b>107.37</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	23248	1032	23718	3337	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.084	<i>0.012</i>	0.028	<i>0.036</i>	0.026	<i>0.012</i>	0.037	<i>0.006</i>
4	0.096	<i>&lt;0.005</i>	0.254	<i>0.488</i>	0.005	<i>&lt;0.005</i>	0.006	<i>0.008</i>
7	0.145	<i>0.050</i>	0.055	<i>0.050</i>	0.005	<i>0.010</i>	0.010	<i>&lt;0.005</i>
11	0.165	<i>0.030</i>	0.060	<i>&lt;0.005</i>	0.005	<i>0.010</i>	0.005	<i>0.010</i>
18	0.415	<i>0.310</i>	0.085	<i>0.050</i>	0.120	<i>0.220</i>	0.025	<i>0.010</i>
25	0.685	<i>0.150</i>	0.185	<i>0.030</i>	0.210	<i>0.400</i>	0.105	<i>0.130</i>
35	0.625	<i>0.030</i>	0.765	<i>0.070</i>	<0.005	-	0.220	<i>0.360</i>
136	0.595	<i>0.130</i>	0.955	<i>0.170</i>	0.010	<i>&lt;0.005</i>	<0.005	-

Table 9-414. Selected nutrients in the pore-water (3-5 cm) after inundation of the Meningie soil material (Site 4): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.389	<i>0.461</i>	0.045	<i>0.070</i>	0.032	<i>&lt;0.005</i>	0.045	<i>0.010</i>
4	0.240	<i>0.440</i>	0.230	<i>0.460</i>	0.035	<i>0.030</i>	0.020	<i>0.040</i>
7	0.055	<i>0.030</i>	0.360	<i>0.520</i>	0.015	<i>0.030</i>	0.035	<i>0.050</i>
11	0.055	<i>0.010</i>	0.275	<i>0.390</i>	0.005	<i>0.010</i>	0.015	<i>0.030</i>
18	0.035	<i>0.030</i>	0.080	<i>0.020</i>	0.045	<i>0.010</i>	0.055	<i>0.050</i>
25	0.230	<i>0.080</i>	0.225	<i>0.190</i>	0.050	<i>0.020</i>	0.085	<i>0.070</i>
35	0.170	<i>0.040</i>	0.605	<i>0.610</i>	0.065	<i>0.030</i>	0.150	<i>&lt;0.005</i>
136	0.195	<i>0.310</i>	0.180	<i>0.100</i>	0.035	<i>0.030</i>	0.025	<i>0.010</i>

Table 9-415. Selected nutrients in the pore-water (10-12 cm) after inundation of the Meningie soil material (Site 4): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.170	<i>0.140</i>	0.375	<i>0.651</i>	0.035	<i>0.010</i>	0.036	<i>0.009</i>
4	0.063	<i>0.125</i>	0.145	<i>0.270</i>	<0.005	-	0.025	<i>0.030</i>
7	0.050	<i>0.040</i>	0.160	<i>0.200</i>	0.005	<i>0.010</i>	0.030	<i>0.020</i>
11	0.105	<i>0.090</i>	0.045	<i>0.010</i>	<0.005	-	0.020	<i>0.040</i>
18	0.145	<i>0.210</i>	0.160	<i>0.180</i>	0.045	<i>0.030</i>	0.070	<i>0.060</i>
25	0.260	<i>0.160</i>	0.095	<i>0.150</i>	0.095	<i>0.090</i>	0.105	<i>0.190</i>
35	0.225	<i>0.030</i>	0.140	<i>0.040</i>	0.120	<i>0.060</i>	0.070	<i>0.120</i>
136	<0.005	-	0.175	<i>0.030</i>	0.240	-	0.065	<i>0.010</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>2.615</b>	2.770	<b>2.000</b>	1.360
25	0.055	0.050	0.090	0.100	1.875	1.270	<b>2.350</b>	1.180
35	0.110	0.100	0.135	0.090	1.745	1.190	<b>1.980</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>2.095</b>	3.210
11	0.020	0.020	0.055	0.010	1.770	0.780	<b>2.770</b>	3.980
18	0.020	<0.005	0.075	0.010	2.275	1.230	<b>3.070</b>	3.880
25	0.090	0.100	0.140	0.140	<b>2.805</b>	1.810	<b>4.065</b>	4.990
35	0.110	0.020	0.065	0.090	<b>3.055</b>	1.950	<b>3.930</b>	4.460
136	0.260	-	0.085	0.050	<b>5.340</b>	-	<b>4.420</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<b>4.05</b>	2.91	4.35	0.82
18	0.04	0.08	0.07	0.13	9.35	1.09	10.63	9.58	<b>4.11</b>	3.01	5.63	5.89
25	0.05	0.06	0.04	0.02	8.16	5.05	16.36	1.90	<b>3.97</b>	4.72	5.89	6.14
35	0.03	0.05	0.03	0.04	13.68	11.26	21.46	10.14	<b>4.62</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	0.02	0.02	0.04	<0.01	0.24	0.06	0.49	0.90	<b>4.34</b>	3.93	6.12	9.56
4	0.02	<0.01	0.01	<0.01	0.50	0.43	1.20	2.25	<b>6.69</b>	2.10	8.69	14.26
7	<0.01	-	0.03	0.02	1.43	0.15	4.60	9.00	<b>7.33</b>	2.00	13.37	22.80
11	<0.01	-	<0.01	-	3.69	3.64	8.63	17.11	<b>11.21</b>	4.49	15.18	25.43
18	<0.01	-	0.01	<0.01	12.70	9.79	18.06	35.01	<b>13.25</b>	3.28	18.94	32.24
25	0.01	<0.01	<0.01	-	25.38	21.70	31.38	60.63	<b>10.28</b>	0.55	19.67	30.10
35	0.02	0.02	<0.01	-	39.32	23.00	35.79	64.89	<b>11.86</b>	0.70	17.23	21.71
136	0.03	-	0.03	0.02	72.42	-	69.11	53.03	<b>12.00</b>	-	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	<b>8.74</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	<15.0	-	<15.0	-	12.24	6.46	<b>10.28</b>	3.30	48.22	6.78	42.28	13.47
4	<15.0	-	<15.0	-	12.76	0.93	<b>9.64</b>	1.76	45.59	12.59	38.70	15.24
7	<15.0	-	<15.0	-	7.23	0.88	<b>12.67</b>	5.97	49.19	16.78	55.68	25.55
11	<15.0	-	21.01	11.95	10.40	6.93	<b>12.46</b>	7.60	59.94	10.83	64.34	20.89
18	29.95	11.13	54.06	53.68	9.52	4.35	<b>11.99</b>	3.88	64.35	13.06	66.37	55.40
25	<15.0	-	82.28	71.59	5.00	0.06	<b>9.44</b>	0.80	52.69	4.13	60.86	47.00
35	32.00	5.81	36.52	36.69	2.85	1.46	<b>14.40</b>	21.70	37.50	7.07	38.01	31.42
136	66.70	-	79.77	48.13	<1.0	-	<b>10.26</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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	0.70	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	137	19	10184	129	4.7	0.3	343.8	2.8	22.3	1.0	397.4	6.3
<b>4</b>	142	12	10220	90	5.8	0.2	368.5	13.2	27.2	1.6	443.4	6.2
<b>7</b>	148	18	10470	-	6.8	0.3	363.4	-	30.3	0.9	450.8	-
<b>11</b>	169	33	10929	38	6.9	0.4	358.6	1.2	30.4	1.7	434.2	12.7
<b>18</b>	240	18	10484	95	9.1	1.0	379.9	2.0	40.1	2.9	433.9	7.9
<b>25</b>	259	102	10365	206	9.1	1.4	410.4	14.1	40.4	15.9	496.9	43.2
<b>35</b>	303	69	10572	46	9.7	0.2	414.7	3.8	49.2	14.1	489.6	31.0
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	4603	1926	9415	1185	82.8	25.9	216.3	3.3	904.7	297.6	944.2	331.0
<b>4</b>	2907	1109	10282	631	57.1	12.7	288.2	25.6	626.7	361.4	911.5	68.1
<b>7</b>	2168	734	10207	30	44.6	2.9	295.6	6.2	521.9	350.0	829.0	30.2
<b>11</b>	1617	319	11173	709	34.0	1.3	316.8	6.5	370.8	247.7	812.5	41.0
<b>18</b>	1845	1055	10843	174	35.0	8.5	341.5	0.4	373.3	387.4	815.6	44.9
<b>25</b>	1462	279	10182	461	27.8	3.0	354.4	30.8	265.5	209.4	797.0	129.1
<b>35</b>	1603	259	10708	446	28.0	3.1	372.7	12.5	263.3	166.1	778.3	129.1
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	13156	3883	14105	660	143.5	22.3	142.3	5.9	1504.4	321.6	1575.0	170.1
<b>4</b>	11489	4002	13346	162	152.8	37.7	151.1	17.6	1616.1	494.8	1672.5	93.0
<b>7</b>	11739	4949	12974	302	145.6	3.3	161.6	5.9	1566.7	207.0	1594.4	187.6
<b>11</b>	10099	1871	12770	877	132.9	0.3	182.4	2.3	1405.7	146.3	1550.3	317.8
<b>18</b>	5708	3606	10029	1942	82.1	27.6	172.1	42.8	851.2	558.4	1231.4	217.4
<b>25</b>	8373	2015	11668	975	105.1	0.9	202.2	24.5	1250.1	451.5	1391.8	38.9
<b>35</b>	7819	2100	12538	98	99.6	10.8	242.8	8.4	1127.9	447.6	1499.3	184.7
<b>136</b>	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.080	<i>0.020</i>	0.105	<i>0.050</i>	0.030	<i>&lt;0.005</i>	0.040	<i>&lt;0.005</i>
4	0.140	<i>0.080</i>	1.665	<i>0.130</i>	0.005	<i>0.010</i>	0.020	<i>0.040</i>
7	0.235	<i>0.050</i>	1.710	<i>0.080</i>	0.005	<i>0.010</i>	0.015	<i>0.010</i>
11	0.270	<i>0.080</i>	1.780	<i>0.380</i>	<0.005	-	0.015	<i>0.030</i>
18	0.425	<i>0.230</i>	1.415	<i>1.270</i>	0.005	<i>0.010</i>	0.050	<i>0.020</i>
25	0.485	<i>0.270</i>	1.235	<i>1.610</i>	<0.005	-	0.080	<i>0.080</i>
35	0.480	<i>0.320</i>	1.185	<i>1.390</i>	0.005	<i>0.010</i>	0.125	<i>0.150</i>
136	0.640	<i>0.140</i>	1.735	<i>1.830</i>	0.010	<i>&lt;0.005</i>	<0.005	-

Table 9-444. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 5): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	4.630	<i>0.800</i>	4.660	<i>5.840</i>	0.060	<i>0.060</i>	0.130	<i>&lt;0.005</i>
4	2.765	<i>0.530</i>	1.900	<i>1.780</i>	0.005	<i>0.010</i>	0.060	<i>&lt;0.005</i>
7	1.280	<i>0.760</i>	0.895	<i>0.710</i>	0.015	<i>0.010</i>	0.060	<i>0.120</i>
11	2.205	<i>3.610</i>	0.775	<i>0.230</i>	0.030	<i>0.040</i>	0.020	<i>&lt;0.005</i>
18	0.540	<i>1.040</i>	0.610	<i>0.420</i>	0.050	<i>0.080</i>	0.080	<i>0.020</i>
25	2.685	<i>4.990</i>	0.610	<i>0.240</i>	0.045	<i>0.070</i>	0.050	<i>0.040</i>
35	0.170	<i>0.200</i>	0.400	<i>0.140</i>	0.025	<i>0.030</i>	0.005	<i>0.010</i>
136	0.010	<i>&lt;0.005</i>	0.640	<i>1.020</i>	0.040	<i>&lt;0.005</i>	0.010	<i>0.020</i>

Table 9-445. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 5): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	13.605	<i>0.650</i>	16.520	<i>0.020</i>	0.030	<i>&lt;0.005</i>	0.045	<i>0.010</i>
4	12.000	<i>2.860</i>	2.435	<i>0.430</i>	0.015	<i>0.010</i>	0.020	<i>0.040</i>
7	9.665	<i>1.870</i>	2.425	<i>0.130</i>	0.015	<i>0.030</i>	0.060	<i>0.100</i>
11	14.465	<i>11.310</i>	2.365	<i>0.470</i>	0.010	<i>0.020</i>	0.010	<i>0.020</i>
18	9.450	<i>13.940</i>	1.420	<i>0.740</i>	0.190	<i>0.240</i>	0.045	<i>0.030</i>
25	6.855	<i>11.830</i>	1.130	<i>0.600</i>	0.240	<i>0.420</i>	0.050	<i>0.040</i>
35	5.495	<i>9.950</i>	1.035	<i>0.570</i>	0.200	<i>0.240</i>	0.050	<i>0.040</i>
136	0.055	<i>0.050</i>	0.180	<i>0.040</i>	0.035	<i>0.030</i>	0.020	<i>&lt;0.005</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	<b>99.87</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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	0.07	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.045	<b>0.030</b>	<0.005	-	0.035	<b>0.010</b>	0.025	<b>0.010</b>
4	0.070	<b>0.040</b>	0.050	<b>&lt;0.005</b>	0.025	<b>0.010</b>	0.005	<b>0.010</b>
7	0.175	<b>0.030</b>	0.095	<b>0.030</b>	0.020	<b>0.040</b>	0.010	<b>0.020</b>
11	0.410	<b>0.120</b>	0.080	<b>0.040</b>	0.025	<b>0.030</b>	<0.005	-
18	0.535	<b>0.210</b>	0.070	<b>0.020</b>	0.025	<b>0.030</b>	0.010	<b>&lt;0.005</b>
25	0.645	<b>0.170</b>	0.125	<b>0.110</b>	0.005	<b>0.010</b>	0.020	<b>&lt;0.005</b>
35	0.640	<b>0.160</b>	0.720	<b>0.220</b>	0.010	<b>&lt;0.005</b>	0.430	<b>0.100</b>
136	0.665	<b>0.010</b>	3.030	<b>0.400</b>	0.005	<b>0.010</b>	0.005	<b>0.010</b>

Table 9-474. Selected nutrients in the pore-water (3-5 cm) after inundation of the Tolderol soil material (Site 6): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.510	<b>0.800</b>	0.265	<b>0.030</b>	0.030	<b>&lt;0.005</b>	0.025	<b>0.010</b>
4	0.635	<b>1.050</b>	0.080	<b>&lt;0.005</b>	0.020	<b>&lt;0.005</b>	0.005	<b>0.010</b>
7	0.325	<b>0.450</b>	0.095	<b>0.050</b>	0.035	<b>0.010</b>	0.010	<b>&lt;0.005</b>
11	0.240	<b>0.240</b>	0.095	<b>0.010</b>	0.005	<b>0.010</b>	<0.005	-
18	0.140	-	0.090	<b>&lt;0.005</b>	0.050	-	0.025	<b>0.010</b>
25	0.175	<b>0.050</b>	0.310	<b>0.200</b>	0.065	<b>0.010</b>	0.075	<b>0.050</b>
35	0.205	<b>0.050</b>	0.415	<b>0.430</b>	0.100	<b>0.020</b>	0.195	<b>0.170</b>
136	0.045	<b>0.010</b>	0.785	<b>0.590</b>	0.065	<b>0.050</b>	0.035	<b>0.010</b>

Table 9-475. Selected nutrients in the pore-water (10-12 cm) after inundation of the Tolderol soil material (Site 6): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.820	<b>0.220</b>	0.505	<b>0.090</b>	0.055	<b>0.030</b>	0.030	<b>&lt;0.005</b>
4	0.895	<b>0.450</b>	0.090	<b>0.040</b>	0.070	<b>0.100</b>	0.005	<b>0.010</b>
7	0.860	<b>0.860</b>	0.055	<b>0.090</b>	0.050	<b>0.040</b>	<0.005	-
11	0.880	<b>0.760</b>	0.170	<b>0.120</b>	0.025	<b>0.030</b>	<0.005	-
18	0.905	<b>0.870</b>	0.080	<b>0.000</b>	0.060	<b>0.020</b>	0.010	<b>&lt;0.005</b>
25	0.910	<b>0.800</b>	0.150	<b>0.120</b>	0.015	<b>0.010</b>	0.015	<b>0.030</b>
35	0.605	<b>0.550</b>	0.150	<b>0.080</b>	0.015	<b>0.010</b>	0.060	<b>0.060</b>
136	<0.005	-	0.160	<b>0.100</b>	0.170	<b>&lt;0.005</b>	0.010	<b>&lt;0.005</b>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>1.930</b>	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	<b>2.275</b>	0.390
35	0.075	0.010	<0.005	<0.005	0.645	0.090	<b>2.020</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
0.08	0.030	<0.005	0.030	0.020	<b>3.720</b>	2.040	<b>2.390</b>	0.200
4	0.085	0.030	0.060	0.020	<b>2.905</b>	1.790	1.520	0.100
7	0.015	0.010	0.020	<0.005	2.295	1.130	<b>1.935</b>	0.250
11	0.020	<0.005	0.330	0.640	1.795	0.930	<b>3.465</b>	1.550
18	0.010	<0.005	0.015	0.010	1.840	0.520	<b>3.715</b>	0.130
25	0.015	0.010	0.015	0.030	1.645	0.330	<b>4.545</b>	0.570
35	0.005	0.010	0.005	0.010	1.630	0.240	<b>4.130</b>	1.320
136	0.190	0.040	0.020	<0.005	<b>6.375</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	5.81	2.29	10.77	1.46	0.65	0.06	1.46	1.51	<b>13.73</b>	4.29	12.26	3.90
4	5.30	1.58	12.86	4.89	0.48	0.03	1.71	1.86	<b>13.42</b>	2.38	2.49	0.87
7	2.06	0.58	8.37	2.22	0.26	<0.01	1.30	0.79	<b>6.75</b>	0.89	1.82	0.31
11	1.80	0.72	4.63	1.17	0.21	0.07	0.55	0.71	<b>7.04</b>	1.98	1.36	0.01
18	1.87	0.84	2.37	1.36	0.20	0.06	0.36	0.44	<b>6.63</b>	2.64	1.04	0.10
25	1.58	0.45	1.08	1.32	0.18	0.07	0.38	0.06	<b>5.86</b>	1.61	1.13	0.06
35	1.00	0.12	0.43	0.85	0.22	0.04	2.08	2.57	<b>6.63</b>	1.89	0.82	0.19
136	<0.01	-	<0.01	-	82.06	16.36	5.81	8.09	<b>8.88</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	1.44	0.10	<15.0	-	3.92	1.72	<b>25.46</b>	34.08	<b>107.27</b>	88.78	277.83	70.10
4	<1.0	-	<15.0	-	2.91	1.03	<b>11.48</b>	9.36	65.56	43.75	84.50	51.56
7	<1.0	-	<15.0	-	3.84	0.46	<b>16.19</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	2.08	0.90	<15.0	-	<b>24.07</b>	1.90	<b>34.39</b>	6.10	<b>377.24</b>	99.02	367.00	32.42
4	1.26	0.35	<15.0	-	<b>19.27</b>	3.19	<b>30.35</b>	6.53	<b>375.45</b>	36.48	81.96	4.88
7	<1.0	-	<15.0	-	12.43	1.60	<b>29.75</b>	5.07	<b>219.96</b>	10.50	52.39	2.79
11	<1.0	-	<15.0	-	11.77	2.83	<b>20.57</b>	6.19	<b>210.85</b>	28.87	39.94	10.10
18	<1.0	-	15.24	0.23	9.88	1.98	<b>13.60</b>	9.20	<b>203.63</b>	35.99	25.43	4.13
25	<1.0	-	31.55	5.55	7.86	0.58	<b>9.87</b>	10.56	<b>197.54</b>	20.00	22.35	5.31
35	<1.0	-	<15.0	-	5.74	0.53	5.88	7.71	<b>159.96</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>140.87</b>	42.20	<0.1	-	0.96	0.16	<1.0	-	49.61	7.39
7	45.66	21.63	<b>93.59</b>	31.68	0.10	<0.1	0.69	0.28	<1.0	-	47.44	6.43
11	29.84	5.62	<b>104.67</b>	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	<b>61.51</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>127.18</b>	46.31	<b>306.96</b>	28.86	0.95	0.74	3.40	0.20	69.93	51.60	<b>166.20</b>	7.68
4	<b>163.99</b>	0.35	<b>219.67</b>	3.77	0.55	0.39	1.07	0.21	41.58	26.90	66.00	53.45
7	<b>180.60</b>	111.21	<b>210.12</b>	67.66	0.19	0.10	1.07	0.16	12.13	4.91	53.74	23.14
11	<b>176.49</b>	72.15	<b>138.03</b>	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	<b>63.35</b>	9.41	<0.1	-	0.62	<0.1	47.93	18.02	12.81	4.56
35	73.43	2.09	<b>100.97</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>314.95</b>	104.36	<b>330.03</b>	1.90	3.88	0.82	3.81	0.62	346.59	92.92	<b>337.91</b>	42.92
4	<b>432.33</b>	120.39	<b>322.21</b>	189.44	3.46	0.23	0.95	<0.1	300.93	50.18	73.41	13.52
7	<b>306.13</b>	4.67	<b>251.55</b>	3.45	1.85	<0.1	0.71	0.30	171.87	21.98	54.44	3.70
11	<b>311.39</b>	29.05	<b>225.19</b>	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	<b>121.23</b>	54.78	1.72	0.28	0.68	<0.1	147.40	22.90	27.70	3.42
35	<b>201.11</b>	48.54	<b>151.88</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	2.73	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
0.08	0.055	0.050	0.070	<0.005	<b>2.750</b>	0.120	<b>2.910</b>	1.600
4	0.090	0.020	0.105	0.010	1.790	0.500	<b>1.735</b>	1.130
7	0.030	0.020	0.035	0.030	<b>2.830</b>	1.980	<b>2.310</b>	0.920
11	0.030	0.020	0.065	0.050	1.580	0.880	<b>2.945</b>	2.190
18	0.010	<0.005	0.020	0.020	1.100	1.700	<b>2.505</b>	1.810
25	0.015	0.010	0.025	0.010	0.980	1.500	<b>2.925</b>	2.170
35	0.025	0.030	0.030	0.020	1.185	1.670	<b>2.155</b>	1.250
136	0.040	0.060	0.055	0.070	<b>2.735</b>	3.190	<b>2.700</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
0.08	0.055	0.010	0.045	0.010	<b>6.105</b>	0.730	<b>4.780</b>	0.660
4	0.105	0.010	0.090	<0.005	<b>5.375</b>	0.670	<b>4.130</b>	0.440
7	0.045	0.010	0.040	<0.005	<b>5.680</b>	0.820	<b>3.940</b>	0.900
11	0.045	0.010	0.045	0.010	<b>5.245</b>	0.330	<b>4.455</b>	0.410
18	0.035	0.050	0.035	0.010	<b>3.695</b>	4.350	<b>3.760</b>	0.260
25	0.065	0.070	0.040	0.020	<b>3.510</b>	2.840	<b>4.010</b>	0.160
35	0.105	0.130	0.070	0.020	<b>3.825</b>	2.830	<b>3.885</b>	0.090
136	0.285	0.030	0.345	0.170	<b>5.895</b>	3.930	<b>5.835</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	67.92	0.39	45.68	28.74	39.89	37.83	15.44	3.65	<b>7.66</b>	1.86	4.98	1.47
4	62.72	0.72	51.46	2.77	50.47	57.99	19.16	3.83	<b>7.70</b>	2.32	3.90	1.13
7	54.95	1.29	45.29	4.09	53.03	56.37	19.28	3.58	<b>6.69</b>	1.59	3.59	1.50
11	53.48	11.98	48.50	15.45	79.62	97.04	28.54	1.75	<b>7.74</b>	3.94	3.70	0.16
18	27.79	45.19	25.01	5.35	84.12	154.58	31.31	14.65	<b>4.38</b>	6.79	2.11	0.91
25	23.96	33.82	19.31	1.79	95.59	155.56	43.90	8.52	<b>3.76</b>	4.98	1.96	0.42
35	20.07	25.81	11.40	3.04	136.43	188.72	60.24	11.59	<b>4.28</b>	5.27	1.84	0.76
136	9.01	12.26	7.77	7.29	331.55	347.87	185.70	20.93	<b>3.86</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	24.94	8.89	<b>43.49</b>	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	<b>80.37</b>	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	<b>96.38</b>	0.49	<0.1	-	0.56	0.37	<1.0	-	29.73	22.03
136	9.21	2.04	<b>79.75</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>263.32</b>	80.44	<b>208.66</b>	83.06	1.88	0.20	2.03	0.66	98.01	23.38	116.80	91.12
4	<b>292.47</b>	115.89	<b>179.42</b>	26.99	1.09	0.52	0.62	0.66	59.36	35.82	37.26	43.81
7	<b>173.55</b>	13.70	<b>167.60</b>	59.96	1.26	0.94	0.54	0.59	74.27	74.26	39.42	52.25
11	<b>178.45</b>	32.18	<b>170.64</b>	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	<b>168.56</b>	198.95	0.34	0.64	0.77	0.85	21.21	39.69	49.40	72.94
35	<b>205.08</b>	46.29	<b>194.71</b>	84.46	0.28	0.53	0.65	0.61	23.24	40.45	37.54	50.92
136	<b>274.89</b>	253.72	<b>151.90</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>411.78</b>	122.17	<b>254.76</b>	36.12	<b>5.17</b>	0.17	3.37	0.95	353.09	68.94	<b>228.06</b>	52.39
4	<b>487.22</b>	284.58	<b>299.30</b>	52.32	<b>4.61</b>	1.01	2.23	0.62	344.73	49.64	<b>168.12</b>	44.69
7	<b>413.65</b>	207.13	<b>319.44</b>	21.60	4.23	0.33	1.98	1.44	310.59	41.66	<b>154.63</b>	62.84
11	<b>550.40</b>	88.49	<b>348.97</b>	51.99	4.33	1.59	1.94	0.32	352.30	131.53	<b>160.32</b>	3.79
18	n.a.	-	n.a.	-	2.67	4.23	1.33	0.27	192.53	288.28	99.46	38.96
25	<b>388.74</b>	371.86	<b>281.02</b>	26.37	2.43	3.53	1.13	0.11	184.58	229.01	89.96	20.68
35	<b>501.74</b>	380.49	<b>431.81</b>	216.66	2.35	2.73	1.05	0.20	195.67	212.82	84.14	28.45
136	<b>595.35</b>	417.82	<b>275.66</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<b>92.85</b>	4.66	63.68	27.73	1.44	2.18	<1.0	-
4	<b>86.06</b>	0.37	63.24	2.73	2.07	2.61	2.21	<1.0
7	<b>76.67</b>	0.89	59.37	4.19	1.01	<1.0	2.61	<1.0
11	<b>83.20</b>	23.62	61.53	18.44	<1.0	-	2.74	1.35
18	<b>41.19</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.048	-	0.021	<i>0.019</i>	0.032	-	0.035	<i>0.010</i>
4	0.075	<i>0.010</i>	0.028	<i>0.045</i>	0.015	<i>0.010</i>	<0.005	-
7	0.150	<i>0.060</i>	0.040	<i>0.020</i>	0.025	<i>0.010</i>	0.010	< <i>0.005</i>
11	0.415	<i>0.130</i>	0.030	<i>0.020</i>	0.040	<i>0.020</i>	<0.005	-
18	0.645	<i>0.050</i>	0.045	<i>0.010</i>	0.010	<i>0.020</i>	0.015	<i>0.010</i>
25	0.795	<i>0.070</i>	0.080	<i>0.040</i>	<0.005	-	<0.005	-
35	0.830	<i>0.020</i>	0.045	<i>0.010</i>	<0.005	-	0.015	<i>0.010</i>
136	1.265	<i>0.650</i>	0.015	<i>0.030</i>	0.005	<i>0.010</i>	0.005	<i>0.010</i>

Table 9-534. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 8): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.090	<i>0.019</i>	0.040	<i>0.080</i>	0.031	< <i>0.005</i>	0.040	< <i>0.005</i>
4	0.094	<i>0.007</i>	0.005	<i>0.010</i>	0.007	<i>0.007</i>	0.005	<i>0.010</i>
7	0.085	<i>0.050</i>	0.035	<i>0.030</i>	0.010	< <i>0.005</i>	0.010	< <i>0.005</i>
11	0.115	<i>0.150</i>	0.030	<i>0.020</i>	<0.005	-	<0.005	-
18	0.055	<i>0.090</i>	0.030	<i>0.020</i>	0.010	< <i>0.005</i>	0.015	<i>0.010</i>
25	0.095	<i>0.030</i>	0.110	<i>0.060</i>	0.005	<i>0.010</i>	0.005	<i>0.010</i>
35	0.100	<i>0.040</i>	0.115	<i>0.110</i>	0.005	<i>0.010</i>	0.025	<i>0.010</i>
136	0.155	<i>0.170</i>	0.110	<i>0.220</i>	0.015	<i>0.010</i>	0.050	<i>0.100</i>

Table 9-535. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 8): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.075	<i>0.010</i>	0.095	<i>0.010</i>	0.040	< <i>0.005</i>	0.040	< <i>0.005</i>
4	0.045	<i>0.010</i>	0.045	<i>0.030</i>	0.025	<i>0.010</i>	0.045	<i>0.050</i>
7	0.065	<i>0.010</i>	0.075	<i>0.070</i>	0.020	< <i>0.005</i>	0.015	<i>0.010</i>
11	0.060	<i>0.040</i>	0.025	<i>0.010</i>	<0.005	-	<0.005	-
18	0.030	< <i>0.005</i>	0.030	<i>0.020</i>	0.005	<i>0.010</i>	0.015	<i>0.010</i>
25	0.075	<i>0.010</i>	0.100	<i>0.000</i>	<0.005	-	<0.005	-
35	0.080	<i>0.020</i>	0.210	<i>0.280</i>	<0.005	-	0.005	<i>0.010</i>
136	0.065	<i>0.010</i>	0.280	<i>0.020</i>	0.010	< <i>0.005</i>	0.020	<i>0.040</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>2.240</b>	0.460
18	0.020	0.020	0.015	0.010	0.180	0.080	<b>2.315</b>	0.310
25	0.015	0.010	0.010	0.020	0.075	0.010	<b>3.245</b>	0.690
35	0.030	0.020	0.015	0.010	0.070	<0.005	<b>2.770</b>	0.060
136	0.035	0.030	0.020	0.020	0.330	0.020	<b>4.350</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.030	<0.005	0.020	0.020	<b>5.660</b>	0.520	<b>3.700</b>	7.080
4	0.030	0.060	0.065	0.010	<b>3.455</b>	2.050	<b>2.780</b>	3.180
7	0.010	<0.005	0.015	0.030	<b>3.740</b>	1.300	<b>3.120</b>	2.480
11	0.020	0.020	0.355	0.670	<b>3.350</b>	0.720	<b>4.650</b>	4.460
18	0.180	0.240	0.210	0.400	<b>3.005</b>	1.130	<b>4.015</b>	2.910
25	1.360	1.140	0.140	0.240	<b>3.300</b>	0.400	<b>4.480</b>	2.920
35	1.740	0.320	0.080	0.140	<b>3.560</b>	0.200	<b>4.480</b>	3.360
136	0.495	0.030	0.095	0.130	<b>4.055</b>	0.710	<b>6.470</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.025	0.010	0.025	0.010	<b>9.675</b>	1.350	<b>9.395</b>	1.850
4	0.041	0.079	0.090	0.000	<b>8.745</b>	1.510	<b>8.520</b>	2.840
7	0.015	0.010	0.030	0.020	<b>8.965</b>	1.870	<b>7.580</b>	1.940
11	0.020	<0.005	0.070	0.060	<b>8.595</b>	1.970	<b>8.600</b>	2.220
18	0.045	0.030	0.195	0.210	<b>7.760</b>	0.260	<b>7.175</b>	1.510
25	0.085	0.050	0.460	0.440	<b>7.500</b>	0.660	<b>7.530</b>	1.220
35	0.125	0.110	0.640	0.860	<b>7.755</b>	0.550	<b>7.410</b>	1.220
136	0.680	0.600	0.545	0.870	<b>9.340</b>	0.740	<b>12.710</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	14.34	9.78	12.58	25.05	7.49	1.36	6.42	12.77	<b>3.91</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	25.67	20.97	24.76	2.29	19.89	8.74	22.95	0.90	<b>7.50</b>	3.94	5.43	0.44
4	24.02	18.96	29.25	16.44	20.07	8.50	22.84	16.02	<b>7.28</b>	4.10	4.14	2.21
7	20.86	15.97	27.03	17.03	20.03	10.63	20.18	14.80	<b>6.26</b>	3.49	3.30	1.55
11	20.33	19.32	26.94	10.75	29.45	21.96	79.42	81.82	<b>6.92</b>	5.02	3.34	0.66
18	11.66	6.54	13.24	4.56	60.60	3.55	113.17	104.62	<b>5.07</b>	1.24	2.02	0.47
25	10.23	6.83	10.63	1.60	92.40	8.90	168.29	47.56	<b>4.30</b>	1.56	2.20	0.05
35	7.13	4.76	4.50	2.85	142.56	23.46	189.76	19.75	<b>4.77</b>	0.93	1.88	0.18
136	1.24	1.42	0.04	0.04	356.00	52.62	534.52	110.34	<b>4.07</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>8.28</b>	1.05	3.05	0.16	16.54	4.19
11	2.43	0.82	<15.0	-	2.87	0.83	<b>8.58</b>	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	<b>16.77</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	3.32	0.74	<15.0	-	<b>28.17</b>	1.09	<b>22.87</b>	40.54	85.76	22.11	38.02	73.79
4	2.83	0.56	<15.0	-	<b>14.06</b>	8.83	<b>11.10</b>	19.24	45.97	50.32	21.02	20.92
7	2.11	0.53	<15.0	-	12.43	6.56	<b>8.54</b>	5.27	37.10	36.84	14.82	2.81
11	4.45	3.94	67.60	130.85	<b>13.45</b>	2.80	<b>11.05</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	4.17	0.34	<15.0	-	<b>51.06</b>	35.96	<b>44.93</b>	13.78	<b>150.16</b>	62.05	117.53	8.92
4	3.95	1.78	<15.0	-	<b>50.74</b>	41.04	<b>46.29</b>	33.02	<b>146.35</b>	79.35	81.79	43.42
7	3.83	0.04	<15.0	-	<b>59.11</b>	52.02	<b>48.28</b>	27.82	<b>136.22</b>	63.91	60.37	30.53
11	5.08	0.54	21.89	14.88	<b>62.76</b>	62.70	<b>64.52</b>	12.57	<b>137.21</b>	78.87	57.42	8.25
18	10.67	1.63	88.32	103.22	<b>50.81</b>	31.48	<b>30.72</b>	6.27	<b>104.65</b>	15.69	32.59	5.97
25	12.82	8.15	179.73	182.21	<b>41.65</b>	29.37	<b>22.01</b>	0.10	<b>97.27</b>	33.13	33.96	1.33
35	33.50	26.72	195.80	263.03	<b>28.32</b>	16.39	<b>10.46</b>	2.17	85.15	10.47	24.00	2.43
136	<b>563.31</b>	216.34	270.09	247.76	1.42	2.32	<b>11.69</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>82.79</b>	27.19	0.32	0.53	0.57	0.29	<1.0	-	6.96	1.66
7	58.46	22.44	<b>48.20</b>	1.93	0.48	<0.1	0.39	<0.1	1.45	0.24	10.40	2.20
11	28.46	1.62	<b>47.18</b>	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	<b>45.31</b>	6.59	0.12	0.24	0.37	0.11	<1.0	-	12.25	1.38
136	18.97	12.65	<b>54.89</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>270.79</b>	82.50	<b>197.91</b>	302.46	0.68	0.11	0.50	0.57	52.13	16.13	25.07	48.42
4	<b>478.35</b>	34.47	<b>145.03</b>	155.61	0.40	0.23	0.30	0.22	27.52	30.48	13.64	14.96
7	<b>288.72</b>	150.87	<b>209.62</b>	220.14	0.30	0.19	0.24	0.18	21.40	19.65	10.04	0.17
11	<b>273.92</b>	100.95	<b>300.32</b>	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	<b>219.28</b>	66.75	<b>85.16</b>	50.49	0.11	<0.1	0.17	0.29	9.21	3.36	13.03	3.15
35	<b>348.27</b>	142.59	<b>184.22</b>	82.42	<0.1	-	0.19	0.12	10.89	3.28	12.50	1.14
136	154.58	22.32	<b>95.26</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>231.30</b>	36.52	<b>274.23</b>	2.81	0.61	0.26	0.72	<0.1	82.97	29.45	71.49	5.96
4	<b>393.89</b>	51.26	<b>235.04</b>	18.57	0.46	<0.1	0.35	0.14	82.90	33.29	51.88	28.19
7	<b>245.95</b>	110.95	<b>234.61</b>	109.42	0.34	<0.1	0.29	<0.1	80.61	32.37	39.58	19.12
11	<b>335.28</b>	170.32	<b>318.69</b>	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	<b>260.00</b>	65.58	<b>275.62</b>	9.96	0.28	<0.1	0.13	<0.1	57.13	12.12	26.30	0.50
35	<b>476.84</b>	148.48	<b>331.09</b>	7.50	0.50	0.58	0.45	0.17	53.47	1.34	23.51	2.94
136	<b>336.34</b>	55.40	<b>95.79</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	1.29	<b>2.58</b>
4	1.99	<b>2.03</b>	<4.4	-	1.35	<b>2.63</b>	1.63	<b>2.94</b>
7	3.91	<b>1.34</b>	<4.4	-	2.49	<b>&lt;1.0</b>	1.12	<b>1.77</b>
11	2.73	<b>0.64</b>	<4.4	-	<1.0	-	<1.0	-
18	2.11	<b>2.52</b>	<4.4	-	1.55	<b>1.33</b>	1.41	<b>1.37</b>
25	2.83	<b>1.39</b>	<4.4	-	<1.0	-	1.07	<b>2.13</b>
35	1.82	<b>1.86</b>	<4.4	-	<1.0	-	<1.0	-
136	1.09	<b>0.14</b>	4.65	<b>3.03</b>			1.12	<b>&lt;1.0</b>

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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	24.13	<b>2.56</b>	18.74	<b>37.49</b>	<1.0	-	<1.0	-
4	8.47	<b>6.04</b>	5.47	<b>10.94</b>	2.16	<b>2.10</b>	<1.0	-
7	6.60	<b>4.70</b>	<4.4	-	1.37	<b>1.10</b>	<1.0	-
11	6.54	<b>2.08</b>	5.67	<b>8.04</b>	<1.0	-	<1.0	-
18	3.27	<b>0.38</b>	<4.4	-	1.79	<b>2.16</b>	<1.0	-
25	3.82	<b>0.25</b>	<4.4	-	<1.0	-	<1.0	-
35	4.05	<b>0.38</b>	<4.4	-	<1.0	-	<1.0	-
136	1.96	<b>1.48</b>	<4.4	-	1.40	<b>&lt;1.0</b>	1.37	<b>1.04</b>

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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	36.97	<b>9.29</b>	47.64	<b>19.93</b>	<1.0	-	<1.0	-
4	29.96	<b>13.16</b>	33.04	<b>10.35</b>	<1.0	-	<1.0	-
7	27.80	<b>13.21</b>	30.17	<b>14.12</b>	<1.0	-	1.20	<b>1.20</b>
11	28.07	<b>19.13</b>	29.85	<b>3.65</b>	1.59	<b>2.17</b>	1.56	<b>&lt;1.0</b>
18	17.59	<b>4.15</b>	17.64	<b>0.52</b>	3.20	-	2.13	<b>1.08</b>
25	14.55	<b>4.07</b>	16.33	<b>2.72</b>	<1.0	-	2.16	<b>&lt;1.0</b>
35	12.35	<b>2.20</b>	8.55	<b>2.03</b>	2.09	<b>3.39</b>	3.97	<b>&lt;1.0</b>
136	3.30	<b>1.63</b>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.090	<i>0.040</i>	0.025	<i>0.030</i>	0.030	<i>&lt;0.005</i>	0.025	<i>0.010</i>
4	0.145	<i>0.050</i>	0.755	<i>0.170</i>	0.010	<i>&lt;0.005</i>	0.025	<i>0.010</i>
7	0.245	<i>0.050</i>	0.790	<i>0.140</i>	0.005	<i>0.010</i>	0.030	<i>&lt;0.005</i>
11	0.320	<i>0.040</i>	1.025	<i>0.010</i>	<i>&lt;0.005</i>	-	0.015	<i>0.010</i>
18	0.430	<i>0.020</i>	0.900	<i>0.360</i>	0.015	<i>0.010</i>	0.045	<i>0.010</i>
25	0.540	<i>0.020</i>	0.980	<i>0.060</i>	<i>&lt;0.005</i>	-	0.050	<i>&lt;0.005</i>
35	0.470	<i>0.040</i>	1.065	<i>0.030</i>	<i>&lt;0.005</i>	-	0.040	<i>0.020</i>
136	0.835	<i>0.170</i>	2.455	<i>0.050</i>	0.015	<i>0.010</i>	<i>&lt;0.005</i>	-

Table 9-564. Selected nutrients in the pore-water (3-5 cm) after inundation of the Point Sturt (North) soil material (Site 9): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	1.734	<i>0.033</i>	5.980	<i>0.340</i>	0.037	<i>0.007</i>	0.040	<i>&lt;0.005</i>
4	2.390	<i>0.640</i>	1.797	<i>0.234</i>	0.030	<i>0.020</i>	0.060	<i>0.060</i>
7	1.780	<i>0.160</i>	2.070	<i>0.120</i>	0.025	<i>0.010</i>	0.185	<i>0.090</i>
11	1.150	<i>0.020</i>	1.850	<i>1.460</i>	0.040	<i>0.000</i>	0.035	<i>0.030</i>
18	0.235	<i>0.210</i>	0.250	<i>0.240</i>	0.070	<i>0.100</i>	0.040	<i>0.080</i>
25	0.180	<i>0.100</i>	0.205	<i>0.270</i>	0.010	<i>&lt;0.005</i>	<i>&lt;0.005</i>	-
35	0.100	<i>0.080</i>	0.180	<i>0.260</i>	0.035	<i>0.030</i>	0.010	<i>0.020</i>
136	0.165	<i>0.130</i>	0.140	<i>0.200</i>	0.020	<i>&lt;0.005</i>	0.030	<i>0.020</i>

Table 9-565. Selected nutrients in the pore-water (10-12 cm) after inundation of the Point Sturt (North) soil material (Site 9): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	5.914	<i>0.428</i>	6.495	<i>0.830</i>	0.031	<i>&lt;0.005</i>	0.045	<i>0.010</i>
4	5.570	<i>0.560</i>	2.625	<i>1.210</i>	0.090	<i>0.020</i>	0.010	<i>&lt;0.005</i>
7	5.535	<i>0.350</i>	2.195	<i>0.510</i>	0.075	<i>0.090</i>	0.015	<i>0.010</i>
11	5.790	<i>0.460</i>	3.025	<i>0.270</i>	0.015	<i>0.010</i>	0.010	<i>&lt;0.005</i>
18	4.185	<i>0.630</i>	2.665	<i>0.830</i>	0.110	<i>0.080</i>	0.060	<i>0.060</i>
25	2.465	<i>1.130</i>	3.010	<i>2.520</i>	0.130	<i>0.040</i>	0.025	<i>0.010</i>
35	1.065	<i>0.730</i>	1.750	<i>1.360</i>	0.125	<i>0.090</i>	0.010	<i>&lt;0.005</i>
136	0.100	<i>0.080</i>	0.110	<i>0.100</i>	0.010	<i>&lt;0.005</i>	0.030	<i>0.020</i>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>1.895</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>55.31</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	45.67	17.72	<b>49.59</b>	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	<b>51.46</b>	0.49	0.11	0.13	0.34	0.26	<1.0	-	<1.0	-
11	113.56	20.65	<b>102.97</b>	-	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	<b>83.65</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>50.13</b>	-	<0.1	-	0.65	0.11	<1.0	-	<1.0	-
7	58.25	7.89	<b>59.32</b>	25.24	<0.1	-	0.61	0.27	<1.0	-	<1.0	-
11	125.62	12.57	<b>146.41</b>	-	<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	<b>170.71</b>	130.38	<b>113.77</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.12	<i>0.15</i>	<4.4	-	<1.0	-	<1.0	-
11	1.28	<i>0.71</i>	<4.4	-	<1.0	-	<1.0	-
18	1.11	<i>0.73</i>	<4.4	-	<1.0	-	<1.0	-
25	1.48	<i>0.51</i>	<4.4	-	<1.0	-	<1.0	-
35	2.60	<i>0.05</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	2.07	<i>4.13</i>	1.68	<i>3.36</i>
4	<1.0	-	<4.4	-	2.77	<i>5.35</i>	2.04	<i>3.77</i>
7	1.24	<i>0.31</i>	<4.4	-	2.63	<i>4.08</i>	2.03	<i>3.58</i>
11	1.35	<i>1.29</i>	<4.4	-	2.80	<i>5.27</i>	1.87	<i>2.96</i>
18	1.24	<i>0.72</i>	<4.4	-	3.34	<i>6.21</i>	3.16	<i>4.69</i>
25	1.69	<i>0.74</i>	<4.4	-	1.85	<i>3.43</i>	1.41	<i>2.72</i>
35	2.23	<i>0.39</i>	<4.4	-	1.99	<i>3.98</i>	1.75	<i>3.49</i>
136	<1.0	-	<4.4	-	1.58	<i>2.42</i>	1.62	<i>1.39</i>

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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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	<i>0.03</i>	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	1.01	<i>&lt;1.0</i>	1.20	<i>&lt;1.0</i>
25	2.01	<i>1.74</i>	<4.4	-	1.49	<i>1.83</i>	<1.0	-
35	2.80	<i>0.62</i>	<4.4	-	<1.0	-	<1.0	-
136	1.32	<i>0.65</i>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	12.9	<0.1	1290.3	5.1	138	7	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>4.030</b>	1.280
7	0.010	0.020	0.015	0.010	1.350	0.040	<b>4.405</b>	1.290
11	0.010	<0.005	0.020	<0.005	0.410	0.440	<b>5.220</b>	1.220
18	0.020	0.020	0.015	0.010	0.395	0.170	<b>4.775</b>	0.190
25	0.020	0.020	<0.005	-	0.085	0.030	<b>3.765</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.025	0.010	0.045	0.030	<b>27.105</b>	4.030	<b>19.833</b>	26.125
4	0.070	<0.005	0.105	0.010	<b>17.875</b>	3.430	<b>5.745</b>	1.790
7	0.025	0.010	0.215	0.170	<b>13.885</b>	5.770	<b>7.870</b>	3.460
11	0.200	0.180	0.115	0.030	<b>14.740</b>	8.820	<b>10.230</b>	3.380
18	0.135	0.010	0.285	0.290	<b>18.585</b>	13.190	<b>10.880</b>	7.580
25	0.120	0.080	0.335	0.310	<b>14.970</b>	11.880	<b>12.675</b>	9.070
35	0.200	0.020	0.280	0.040	<b>14.420</b>	9.020	<b>8.355</b>	9.350
136	0.765	0.710	0.130	0.040	<b>7.705</b>	4.930	<b>4.595</b>	3.590

Table 9-598. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 10): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.035	0.010	0.045	0.030	<b>34.070</b>	2.500	<b>31.946</b>	0.518
4	0.090	<0.005	0.080	0.020	<b>36.050</b>	1.700	<b>12.030</b>	6.000
7	0.020	0.020	0.085	0.130	<b>35.650</b>	1.700	<b>16.925</b>	13.670
11	0.040	<0.005	0.165	0.230	<b>33.420</b>	0.800	<b>26.710</b>	19.220
18	0.030	<0.005	0.410	0.060	<b>33.185</b>	7.030	<b>35.000</b>	13.000
25	0.030	<0.005	0.615	0.030	<b>36.250</b>	0.300	<b>34.065</b>	8.870
35	0.150	0.060	0.115	0.010	<b>37.350</b>	3.700	<b>27.065</b>	5.010
136	0.115	0.010	0.140	0.060	<b>20.115</b>	3.270	<b>9.960</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	32.60	2.04	16.39	11.71	2.41	0.02	17.04	29.19	<b>8.06</b>	0.50	6.19	0.69
4	30.44	2.14	3.12	1.12	2.80	0.73	25.35	47.20	<b>7.68</b>	0.76	1.09	0.32
7	28.47	2.00	0.43	0.64	6.84	1.79	85.42	100.38	<b>7.11</b>	1.15	1.09	0.36
11	22.79	1.79	0.03	0.04	21.82	7.28	164.29	55.06	<b>6.56</b>	1.00	1.04	0.39
18	16.05	1.55	0.01	<0.01	48.76	12.54	170.07	23.34	<b>6.08</b>	0.91	0.95	0.51
25	5.06	6.08	<0.01	-	144.56	39.23	127.79	25.29	<b>5.18</b>	0.77	1.26	1.00
35	0.11	0.08	<0.01	-	184.87	55.79	83.27	23.16	<b>4.60</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>54.83</b>	17.19	<0.1	-	0.46	0.31	<1.0	-	21.26	12.43
7	34.60	12.05	<b>50.54</b>	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	<b>74.72</b>	-	<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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>271.61</b>	22.29	<b>147.43</b>	125.06	1.22	0.72	1.96	1.00	82.73	54.67	124.80	172.44
4	<b>415.62</b>	98.65	<b>72.66</b>	21.47	0.57	0.32	0.40	<0.1	47.16	24.70	25.04	8.13
7	<b>336.79</b>	124.66	<b>59.15</b>	6.18	0.27	0.43	0.17	<0.1	36.36	26.29	35.75	14.35
11	<b>349.30</b>	395.77	<b>91.15</b>	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	<b>88.52</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>310.33</b>	55.65	<b>306.18</b>	69.51	1.92	0.19	1.26	0.43	164.49	4.97	129.53	11.12
4	<b>460.57</b>	150.69	<b>151.74</b>	38.71	1.49	0.62	0.38	0.35	157.94	11.34	24.78	12.06
7	<b>283.58</b>	21.25	<b>105.98</b>	9.44	1.62	0.42	0.12	<0.1	158.48	23.55	25.68	5.83
11	<b>497.70</b>	331.02	<b>116.66</b>	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	<b>240.78</b>	35.32	22.31	13.91	0.58	0.50	<0.1	-	97.01	25.06	7.98	4.97
35	<b>188.49</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.07	<i>0.25</i>	<4.4	-	<1.0	-	<1.0	-
7	1.22	<i>0.11</i>	<4.4	-	<1.0	-	<1.0	-
11	1.49	<i>0.22</i>	<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	<i>0.00</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	3.01	<i>1.93</i>	<4.4	-	4.50	<i>7.68</i>	2.97	<i>5.89</i>
4	<1.0	-	<4.4	-	1.84	<i>2.90</i>	<1.0	-
7	1.17	<i>0.54</i>	<4.4	-	1.93	<i>2.67</i>	<1.0	-
11	1.58	<i>0.62</i>	<4.4	-	2.76	<i>2.31</i>	<1.0	-
18	1.26	<i>0.79</i>	<4.4	-	1.57	<i>1.17</i>	<1.0	-
25	2.13	<i>0.03</i>	4.65	<i>0.41</i>	<1.0	-	<1.0	-
35	3.85	<i>1.21</i>	<4.4	-	<1.0	-	<1.0	-
136	1.04	<i>0.36</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	13.72	<i>1.25</i>	5.85	<i>0.83</i>	3.50	<i>5.04</i>	<b>12.77</b>	<i>2.08</i>
4	9.10	<i>1.36</i>	<4.4	-	3.75	<i>4.47</i>	<b>33.76</b>	<i>31.44</i>
7	7.81	<i>1.37</i>	<4.4	-	3.96	<i>4.23</i>	10.81	<i>18.76</i>
11	6.41	<i>1.32</i>	<4.4	-	2.90	<i>2.96</i>	<1.0	-
18	4.51	<i>0.29</i>	<4.4	-	3.66	<i>2.47</i>	<1.0	-
25	2.98	<i>2.44</i>	<4.4	-	<1.0	-	<1.0	-
35	3.82	<i>0.22</i>	<4.4	-	<1.0	-	<1.0	-
136	1.55	<i>0.46</i>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	5.280	<b>10.360</b>	0.743	<b>0.255</b>	0.060	<b>0.060</b>	0.053	<b>0.035</b>
4	0.138	<b>0.016</b>	3.380	<b>0.460</b>	0.007	<b>0.006</b>	0.065	<b>0.050</b>
7	0.170	<b>0.060</b>	3.645	<b>0.370</b>	0.025	<b>0.030</b>	0.175	<b>0.170</b>
11	0.345	<b>0.090</b>	5.180	<b>0.040</b>	0.050	<b>0.020</b>	0.325	<b>0.470</b>
18	0.495	<b>0.010</b>	3.660	<b>0.500</b>	0.010	<b>0.020</b>	0.365	<b>0.510</b>
25	0.560	<b>0.040</b>	3.765	<b>0.590</b>	<0.005	-	0.030	<b>0.060</b>
35	0.600	<b>0.100</b>	3.375	<b>0.430</b>	0.005	<b>0.010</b>	<0.005	-
136	0.350	<b>0.220</b>	6.095	<b>2.350</b>	0.015	<b>0.010</b>	0.005	<b>0.010</b>

Table 9-624. Selected nutrients in the pore-water (3-5 cm) after inundation of the Milang soil material (Site 11): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	16.760	<b>5.600</b>	14.285	<b>1.550</b>	0.145	<b>0.010</b>	0.090	<b>0.100</b>
4	0.325	<b>0.270</b>	4.690	<b>3.900</b>	0.030	<b>&lt;0.005</b>	0.110	<b>0.020</b>
7	0.065	<b>0.010</b>	4.255	<b>1.330</b>	0.010	<b>&lt;0.005</b>	0.210	<b>0.060</b>
11	0.230	<b>0.160</b>	3.710	<b>0.360</b>	0.030	<b>0.020</b>	0.195	<b>0.290</b>
18	0.210	<b>0.160</b>	1.870	<b>0.900</b>	0.020	<b>&lt;0.005</b>	0.235	<b>0.330</b>
25	0.235	<b>0.050</b>	2.670	<b>3.140</b>	0.005	<b>0.010</b>	0.050	<b>0.060</b>
35	0.215	<b>0.150</b>	2.115	<b>2.110</b>	0.010	<b>0.020</b>	0.020	<b>&lt;0.005</b>
136	0.670	<b>0.460</b>	3.835	<b>1.010</b>	0.005	<b>0.010</b>	0.090	<b>&lt;0.005</b>

Table 9-625. Selected nutrients in the pore-water (10-12 cm) after inundation of the Milang soil material (Site 11): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	<b>25.750</b>	<b>5.940</b>	53.929	<b>24.450</b>	0.150	<b>0.020</b>	0.640	<b>1.100</b>
4	15.970	<b>1.800</b>	19.985	<b>15.190</b>	0.110	<b>0.060</b>	0.325	<b>0.410</b>
7	8.920	<b>0.760</b>	14.185	<b>23.890</b>	0.100	<b>0.100</b>	0.105	<b>0.090</b>
11	1.845	<b>0.990</b>	9.210	<b>18.140</b>	0.015	<b>0.010</b>	0.020	<b>0.020</b>
18	0.060	<b>0.060</b>	1.380	<b>2.760</b>	0.115	<b>0.010</b>	0.210	<b>0.360</b>
25	0.215	<b>0.030</b>	0.105	<b>0.170</b>	0.175	<b>0.030</b>	0.300	<b>0.480</b>
35	0.340	<b>0.040</b>	0.225	<b>0.110</b>	0.230	<b>0.100</b>	0.290	<b>0.160</b>
136	0.090	-	0.600	<b>0.600</b>	0.020	-	0.120	<b>0.040</b>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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	<b>2.155</b>	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	<b>2.605</b>	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
0.08	0.555	0.030	0.410	0.560	<b>3.145</b>	3.090	<b>3.665</b>	7.030
4	0.615	0.170	0.390	0.620	<b>5.385</b>	2.370	<b>6.160</b>	6.160
7	0.525	0.130	0.270	0.460	<b>6.585</b>	2.430	<b>9.030</b>	7.600
11	0.500	0.060	0.385	0.590	<b>7.240</b>	2.200	<b>10.240</b>	7.700
18	0.155	0.150	0.490	0.200	<b>9.295</b>	2.810	<b>11.785</b>	11.930
25	0.170	0.080	0.390	0.560	<b>11.740</b>	2.400	<b>15.915</b>	13.130
35	0.215	0.010	0.285	0.110	<b>12.950</b>	1.900	<b>16.355</b>	10.090
136	4.190	-	0.280	0.180	<b>11.350</b>	0.960	<b>10.005</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	0.70	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<b>7.88</b>	0.63	4.67	2.73
25	<0.01	-	<0.01	-	45.51	15.98	72.96	120.62	<b>9.53</b>	1.84	7.64	3.03
35	<0.01	-	0.02	0.03	58.74	27.93	92.74	43.33	<b>9.32</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	10.27	0.29	<15.0	-	11.24	1.33	<b>8.42</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
0.08	14.55	0.15	<15.0	-	<b>15.91</b>	0.07	<b>14.75</b>	4.33	48.59	11.42	72.05	51.80
4	11.79	1.74	16.00	0.94	<b>17.45</b>	0.31	<b>12.56</b>	2.39	63.48	25.91	89.58	59.10
7	15.96	3.73	<15.0	-	<b>18.17</b>	2.72	<b>11.54</b>	3.55	63.66	26.12	97.62	50.71
11	25.21	10.70	20.06	11.23	11.07	1.22	<b>10.26</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
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	<b>49.44</b>	-	<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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
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	<b>72.71</b>	1.40	<0.1	-	0.30	<0.1	3.75	0.89	2.31	0.20
7	50.42	15.14	<b>50.39</b>	12.56	<0.1	-	0.28	<0.1	6.18	2.39	2.43	0.44
11	35.07	-	<b>75.50</b>	-	<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	0.07	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
0.08	57.38	3.56	<b>75.95</b>	41.81	0.35	0.13	0.50	0.80	9.41	1.10	28.93	41.94
4	125.55	16.28	<b>129.45</b>	109.60	0.34	0.30	1.16	0.94	19.79	13.93	47.26	74.49
7	99.84	22.11	<b>163.07</b>	75.83	0.51	0.55	1.37	0.25	25.03	14.89	74.48	95.88
11	161.00	72.02	<b>142.74</b>	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	<b>45.68</b>	20.90	0.16	<0.1	0.17	<0.1	84.03	48.05	138.36	94.20
35	28.17	13.89	<b>75.22</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.35	<b>0.42</b>	<4.4	-	<1.0	-	1.42	<b>2.38</b>
11	1.69	<b>0.57</b>	<4.4	-	<1.0	-	<1.0	-
18	1.06	<b>0.18</b>	<4.4	-	<1.0	-	<1.0	-
25	1.60	<b>0.80</b>	<4.4	-	<1.0	-	<1.0	-
35	2.44	<b>0.07</b>	<4.4	-	<1.0	-	<1.0	-
136	1.57	<b>0.16</b>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.51	<b>1.56</b>	<4.4	-	<1.0	-	<1.0	-
4	1.57	<b>0.54</b>	<4.4	-	<1.0	-	<1.0	-
7	1.68	<b>0.79</b>	<4.4	-	1.47	-	<1.0	-
11	1.84	<b>0.40</b>	<4.4	-	<1.0	-	<1.0	-
18	1.39	<b>0.70</b>	<4.4	-	<1.0	-	<1.0	-
25	2.30	<b>0.87</b>	<4.4	-	<1.0	-	<1.0	-
35	2.90	<b>0.36</b>	<4.4	-	<1.0	-	<1.0	-
136	1.94	<b>0.42</b>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.96	<b>0.89</b>	<4.4	-	<1.0	-	<1.0	-
4	2.50	<b>1.69</b>	<4.4	-	<1.0	-	1.46	<b>2.65</b>
7	2.05	<b>0.02</b>	<4.4	-	<1.0	-	<1.0	-
11	3.46	<b>0.74</b>	<4.4	-	<1.0	-	1.60	<b>1.64</b>
18	1.59	<b>0.28</b>	<4.4	-	<1.0	-	1.05	<b>&lt;1.0</b>
25	4.73	<b>0.50</b>	<4.4	-	<1.0	-	<1.0	-
35	5.93	<b>0.08</b>	<4.4	-	<1.0	-	<1.0	-
136	3.95	<b>0.11</b>	4.51	<b>3.14</b>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	187	167	10614	57	12.6	16.7	359.0	8.0	58.7	77.0	437.9	8.9
<b>4</b>	123	10	9723	446	5.7	0.5	362.9	17.4	23.9	1.7	492.1	5.3
<b>7</b>	112	10	9338	447	5.8	1.0	333.1	1.2	26.9	2.6	479.9	18.6
<b>11</b>	115	4	9662	488	5.8	0.5	332.1	15.0	28.0	1.6	468.6	24.0
<b>18</b>	105	9	9503	199	5.6	0.6	354.2	0.4	28.8	3.2	472.2	10.3
<b>25</b>	119	6	8868	672	6.7	0.4	354.3	32.1	30.7	1.2	469.7	50.7
<b>35</b>	132	12	9232	859	7.2	0.9	363.3	26.4	31.1	2.0	489.8	55.0
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	517	404	9018	216	41.7	22.0	306.3	3.4	173.1	121.9	546.7	51.7
<b>4</b>	331	99	8966	325	28.3	2.9	341.5	20.5	99.9	11.9	523.4	15.6
<b>7</b>	256	85	9337	969	19.3	3.7	340.8	14.6	95.4	17.2	507.5	7.9
<b>11</b>	180	116	9692	166	10.9	9.0	334.0	0.6	53.2	47.9	480.9	21.3
<b>18</b>	190	82	9479	777	11.8	4.4	341.2	18.3	68.8	22.2	482.7	38.3
<b>25</b>	197	47	8812	682	13.0	2.7	340.1	39.1	64.1	11.8	473.3	62.7
<b>35</b>	202	40	9002	225	12.2	1.8	350.0	2.0	59.3	11.1	496.1	19.6
<b>136</b>	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
<b>0.08</b>	1005	244	2749	1366	73.8	23.3	118.6	32.1	349.3	74.9	499.7	76.9
<b>4</b>	1177	61	5580	834	85.2	6.7	228.4	14.9	399.3	42.7	631.2	150.1
<b>7</b>	996	102	6340	1123	70.9	5.3	235.4	12.4	353.8	59.6	614.1	39.6
<b>11</b>	922	125	7407	1417	64.3	1.0	252.1	27.1	311.1	42.1	559.6	46.5
<b>18</b>	795	124	7854	434	48.9	<0.1	276.0	6.3	294.5	17.9	525.5	74.3
<b>25</b>	827	16	7629	472	45.8	4.7	274.7	4.0	281.9	16.3	538.6	129.1
<b>35</b>	759	70	8168	767	39.6	2.4	272.6	24.5	244.7	2.1	512.5	70.2
<b>136</b>	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.120	<b>0.141</b>	0.517	<b>1.013</b>	0.031	<b>&lt;0.005</b>	0.015	<b>0.030</b>
4	0.060	<b>0.080</b>	0.055	<b>0.110</b>	0.010	<b>0.020</b>	0.004	<b>0.008</b>
7	0.050	<b>0.020</b>	0.020	<b>0.040</b>	0.005	<b>0.010</b>	0.015	<b>0.030</b>
11	0.045	<b>0.030</b>	0.070	<b>0.140</b>	0.005	<b>0.010</b>	0.005	<b>0.010</b>
18	0.050	<b>0.020</b>	0.045	<b>0.010</b>	0.070	<b>0.040</b>	0.010	<b>&lt;0.005</b>
25	0.375	<b>0.270</b>	0.085	<b>0.030</b>	0.230	<b>0.180</b>	<0.005	-
35	0.795	<b>0.230</b>	1.365	<b>2.150</b>	0.505	<b>0.190</b>	0.780	<b>1.500</b>
136	0.060	<b>0.040</b>	1.050	<b>1.040</b>	<0.005	-	0.005	<b>0.010</b>

Table 9-654. Selected nutrients in the pore-water (3-5 cm) after inundation of the Ewe Island Barrage soil material (Site 12): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.014	<b>0.008</b>	0.010	<b>0.020</b>	0.031	<b>&lt;0.005</b>	0.040	<b>&lt;0.005</b>
4	0.023	<b>0.005</b>	0.015	<b>0.010</b>	0.008	<b>0.005</b>	<0.005	-
7	0.120	<b>0.120</b>	0.080	<b>0.100</b>	0.015	<b>0.010</b>	0.015	<b>0.010</b>
11	0.055	<b>0.010</b>	0.040	<b>0.040</b>	0.005	<b>0.010</b>	<0.005	-
18	0.080	<b>0.060</b>	0.045	<b>0.010</b>	0.020	<b>0.020</b>	0.015	<b>0.010</b>
25	0.140	<b>0.080</b>	0.075	<b>0.050</b>	0.060	<b>0.080</b>	0.010	<b>&lt;0.005</b>
35	0.200	<b>0.180</b>	0.985	<b>1.930</b>	0.125	<b>0.110</b>	0.590	<b>1.180</b>
136	0.135	<b>0.270</b>	0.655	<b>0.630</b>	<0.005	-	0.005	<b>0.010</b>

Table 9-655. Selected nutrients in the pore-water (10-12 cm) after inundation of the Ewe Island Barrage soil material (Site 12): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.039	<b>0.043</b>	0.015	<b>0.030</b>	0.027	<b>0.013</b>	0.050	<b>0.040</b>
4	0.005	<b>0.010</b>	0.005	<b>0.010</b>	0.015	<b>0.010</b>	0.015	<b>0.010</b>
7	0.100	<b>0.100</b>	0.065	<b>0.050</b>	0.005	<b>0.010</b>	0.035	<b>0.010</b>
11	0.075	<b>0.010</b>	0.050	<b>0.060</b>	<0.005	-	0.005	<b>0.010</b>
18	0.055	<b>0.090</b>	0.040	<b>0.020</b>	0.010	<b>&lt;0.005</b>	0.045	<b>0.010</b>
25	0.065	<b>0.010</b>	0.080	<b>0.020</b>	<0.005	-	0.030	<b>0.020</b>
35	0.050	<b>0.020</b>	0.455	<b>0.710</b>	0.005	<b>0.010</b>	0.035	<b>0.030</b>
136	0.135	<b>0.090</b>	0.075	<b>0.030</b>	<0.005	-	0.015	<b>0.010</b>

\* 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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	<0.01	-	<0.01	-	<0.01	-	0.05	<i>0.03</i>	<0.01	-	<0.01	-
4	0.02	<i>&lt;0.01</i>	<0.01	-	0.04	<i>0.02</i>	0.05	<i>0.05</i>	0.04	<i>0.03</i>	3.10	<i>0.80</i>
7	0.04	<i>0.04</i>	0.03	<i>0.02</i>	<0.01	-	0.34	<i>0.49</i>	0.08	<i>0.13</i>	3.67	<i>1.07</i>
11	0.02	<i>0.02</i>	<0.01	-	0.02	<i>0.03</i>	0.14	<i>0.11</i>	0.04	<i>0.06</i>	3.91	<i>0.49</i>
18	<0.01	-	0.03	<i>&lt;0.01</i>	0.04	<i>0.07</i>	0.13	<i>0.07</i>	0.02	<i>&lt;0.01</i>	3.59	<i>0.23</i>
25	0.03	<i>0.05</i>	<0.01	-	0.07	<i>0.01</i>	0.20	<i>&lt;0.01</i>	0.03	<i>0.02</i>	3.67	<i>1.87</i>
35	0.01	<i>&lt;0.01</i>	<0.01	-	0.08	<i>0.14</i>	0.09	<i>&lt;0.01</i>	0.02	<i>0.03</i>	2.77	<i>3.07</i>
136	<0.01	-	<0.01	-	<0.01	-	0.07	<i>&lt;0.01</i>	<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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	0.02	<i>0.03</i>	<0.01	-	0.10	<i>0.19</i>	1.49	<i>2.91</i>	0.62	<i>0.32</i>	1.57	<i>3.12</i>
4	0.06	<i>0.10</i>	0.01	<i>&lt;0.01</i>	0.91	<i>1.13</i>	0.07	<i>0.03</i>	2.53	<i>3.75</i>	3.11	<i>0.49</i>
7	0.02	<i>&lt;0.01</i>	0.02	<i>&lt;0.01</i>	0.46	<i>0.33</i>	0.27	<i>0.21</i>	1.13	<i>1.09</i>	3.75	<i>1.22</i>
11	0.01	<i>&lt;0.01</i>	0.02	<i>&lt;0.01</i>	0.16	<i>0.10</i>	0.12	<i>0.03</i>	0.36	<i>0.06</i>	3.76	<i>1.10</i>
18	<0.01	-	<0.01	-	0.14	<i>0.05</i>	0.13	<i>0.08</i>	0.35	<i>0.04</i>	3.66	<i>0.22</i>
25	<0.01	-	<0.01	-	0.13	<i>0.06</i>	0.13	<i>&lt;0.01</i>	0.33	<i>0.10</i>	3.33	<i>1.33</i>
35	<0.01	-	<0.01	-	0.18	<i>0.06</i>	0.09	<i>0.05</i>	0.47	<i>0.09</i>	2.75	<i>2.87</i>
136	0.04	<i>0.08</i>	<0.01	-	1.08	<i>1.93</i>	0.19	<i>0.13</i>	0.44	<i>0.25</i>	0.52	<i>0.75</i>

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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	0.02	<i>0.01</i>	<0.01	-	0.44	<i>0.88</i>	0.05	<i>0.02</i>	0.53	<i>1.00</i>	0.63	<i>0.56</i>
4	0.01	<i>&lt;0.01</i>	0.01	<i>&lt;0.01</i>	1.68	<i>1.11</i>	2.05	<i>0.66</i>	2.22	<i>1.89</i>	3.36	<i>1.72</i>
7	0.02	<i>0.01</i>	0.02	<i>&lt;0.01</i>	1.02	<i>0.95</i>	2.63	<i>0.71</i>	1.99	<i>1.20</i>	5.02	<i>2.39</i>
11	<0.01	-	<0.01	-	0.29	<i>0.26</i>	4.60	<i>0.99</i>	1.77	<i>0.74</i>	5.73	<i>2.04</i>
18	<0.01	-	<0.01	-	0.59	<i>0.12</i>	4.99	<i>0.59</i>	1.39	<i>0.25</i>	5.41	<i>0.77</i>
25	<0.01	-	<0.01	-	0.12	<i>0.04</i>	7.83	<i>2.64</i>	1.29	<i>0.09</i>	6.89	<i>0.76</i>
35	0.05	<i>0.09</i>	<0.01	-	0.19	<i>0.10</i>	8.21	<i>3.52</i>	1.19	<i>0.06</i>	6.50	<i>1.71</i>
136	<0.01	-	<0.01	-	0.24	<i>0.17</i>	10.77	<i>2.27</i>	0.98	<i>0.14</i>	6.60	<i>1.05</i>

\* 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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
0.08	11.31	<i>16.28</i>	17.48	<i>0.34</i>	<0.1	-	0.18	<i>&lt;0.1</i>	<1.0	-	<1.0	-
4	43.60	<i>8.11</i>	27.56	<i>4.54</i>	<0.1	-	0.18	<i>&lt;0.1</i>	<1.0	-	<1.0	-
7	31.92	<i>20.46</i>	22.31	<i>3.79</i>	<0.1	-	0.13	<i>&lt;0.1</i>	<1.0	-	<1.0	-
11	64.47	<i>7.38</i>	17.99	<i>11.01</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	0.11	<i>&lt;0.1</i>	<1.0	-	<1.0	-
25	2.39	<i>1.70</i>	6.10	<i>0.25</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	46.65	<i>41.55</i>	36.71	<i>20.12</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
136	1.90	<i>2.17</i>	<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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
0.08	33.81	<i>7.47</i>	33.25	<i>24.42</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	47.88	<i>2.96</i>	19.46	-	<0.1	-	0.17	<i>&lt;0.1</i>	<1.0	-	<1.0	-
7	21.15	<i>9.40</i>	<b>46.96</b>	<i>48.38</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
11	14.92	-	41.31	<i>16.01</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
25	6.01	<i>5.19</i>	10.06	<i>1.69</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	11.93	<i>17.64</i>	33.88	<i>7.37</i>	<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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>161.2</b>		<b>43</b>		<b>4.6</b>		<b>36</b>		n.a.		<b>150</b>	
0.08	35.81	<i>16.81</i>	31.07	<i>4.05</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
4	37.89	<i>15.75</i>	21.68	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
7	6.01	<i>2.07</i>	15.17	<i>1.59</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
11	10.65	-	22.78	<i>11.80</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
18	n.a.	-	n.a.	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
25	5.53	<i>0.08</i>	11.40	<i>0.37</i>	<0.1	-	<0.1	-	<1.0	-	<1.0	-
35	5.04	<i>1.43</i>	9.45	-	<0.1	-	<0.1	-	<1.0	-	<1.0	-
136	4.18	<i>1.05</i>	6.95	<i>6.72</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	<1.0	-	<4.4	-	<1.0	-	<1.0	-
7	1.05	<i>0.09</i>	<4.4	-	<1.0	-	<1.0	-
11	2.07	<i>0.75</i>	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	1.08	<i>&lt;1.0</i>	<1.0	-
25	3.18	<i>0.72</i>	4.77	<i>0.69</i>	<1.0	-	<1.0	-
35	2.72	<i>0.15</i>	<4.4	-	<1.0	-	<1.0	-
136	1.61	<i>0.74</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<1.0	-	<4.4	-	<1.0	-	<1.0	-
4	1.29	<i>0.71</i>	<4.4	-	<1.0	-	<1.0	-
7	1.59	<i>0.17</i>	<4.4	-	<1.0	-	<1.0	-
11	2.21	<i>0.48</i>	<4.4	-	<1.0	-	<1.0	-
18	1.30	<i>0.67</i>	<4.4	-	<1.0	-	<1.0	-
25	3.15	<i>0.57</i>	5.06	<i>0.74</i>	<1.0	-	<1.0	-
35	9.01	<i>10.63</i>	<4.4	-	<1.0	-	<1.0	-
136	2.04	<i>0.55</i>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.03	<i>0.18</i>	<4.4	-	<1.0	-	<1.0	-
4	1.05	<i>0.52</i>	<4.4	-	<1.0	-	<1.0	-
7	1.72	<i>0.47</i>	<4.4	-	<1.0	-	<1.0	-
11	3.19	<i>0.73</i>	<4.4	-	<1.0	-	<1.0	-
18	1.61	<i>0.89</i>	<4.4	-	<1.0	-	<1.0	-
25	4.00	<i>0.07</i>	5.50	<i>0.08</i>	<1.0	-	<1.0	-
35	3.90	<i>1.36</i>	<4.4	-	<1.0	-	<1.0	-
136	2.07	<i>0.77</i>	<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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	28.39	23.87	41.02	29.63	15.09	7.83	24.24	28.78	<b>4.31</b>	3.02	5.17	4.05
4	28.02	19.90	4.74	1.77	9.92	4.48	1.59	1.44	<b>4.56</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	119.02	7.23	156.59	76.75	150.28	12.74	179.63	209.54	<b>16.93</b>	1.67	18.64	6.24
4	104.31	17.32	106.31	54.07	128.21	46.65	141.94	202.48	<b>14.72</b>	1.90	12.02	6.45
7	124.37	14.59	81.14	71.67	178.52	40.50	138.76	216.62	<b>16.50</b>	1.45	9.52	8.75
11	114.09	4.53	68.43	75.34	218.41	37.99	176.07	253.57	<b>15.52</b>	0.98	8.01	8.13
18	84.59	0.57	54.44	63.23	305.36	5.21	223.55	275.58	<b>15.40</b>	0.63	7.66	7.71
25	72.46	2.82	52.18	56.66	366.24	46.95	261.16	279.99	<b>14.14</b>	1.19	8.08	7.46
35	60.22	3.20	51.15	51.20	449.19	56.63	350.39	308.08	<b>14.22</b>	1.28	9.46	7.39
136	25.46	2.32	63.17	58.30	716.18	0.45	711.24	372.19	<b>10.20</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>10.86</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	4.33	3.86	<15.0	-	<b>50.15</b>	59.70	<b>61.82</b>	62.00	<b>175.57</b>	124.80	229.36	189.93
4	3.40	2.61	19.61	0.24	<b>38.29</b>	32.44	<b>10.78</b>	7.60	<b>196.78</b>	128.93	44.69	2.31
7	2.54	1.50	<15.0	-	<b>22.26</b>	17.84	<b>12.46</b>	9.01	<b>128.38</b>	85.52	58.00	8.55
11	2.30	1.34	17.64	2.42	<b>14.05</b>	0.02	<b>8.94</b>	4.97	<b>101.56</b>	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	<b>8.43</b>	0.84	62.46	41.55	78.73	25.24
35	1.55	2.06	<15.0	-	8.74	1.21	<b>11.74</b>	5.05	69.02	40.52	73.35	17.91
136	6.93	4.25	61.22	16.98	<1.0	-	<b>12.71</b>	4.95	<b>101.95</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	9.62	0.63	<15.0	-	<b>173.90</b>	89.95	<b>203.33</b>	2.81	<b>623.46</b>	52.52	<b>790.82</b>	264.01
4	6.27	0.28	<15.0	-	<b>140.81</b>	31.36	<b>130.55</b>	11.82	<b>601.69</b>	72.84	512.47	269.96
7	7.37	3.01	17.52	0.98	<b>145.81</b>	60.34	<b>93.84</b>	14.32	<b>629.15</b>	59.56	396.68	364.34
11	10.10	5.14	15.72	10.89	<b>112.00</b>	73.40	<b>72.11</b>	10.48	<b>589.01</b>	40.73	314.02	321.11
18	17.39	6.77	32.87	5.20	<b>81.11</b>	86.56	<b>48.13</b>	29.38	<b>597.08</b>	5.83	304.73	303.14
25	20.65	8.33	39.97	10.13	<b>44.79</b>	58.92	<b>38.87</b>	32.91	<b>552.39</b>	74.92	333.73	289.73
35	20.80	1.89	16.69	17.91	<b>25.73</b>	33.19	<b>35.51</b>	24.13	<b>524.08</b>	24.79	382.75	307.62
136	70.05	9.75	85.13	37.10	<1.0	-	7.34	9.93	<b>369.35</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>62.40</b>	8.67	0.30	0.31	0.57	0.52	1.25	1.81	10.40	6.48
7	41.26	2.24	<b>78.31</b>	20.64	0.33	0.32	0.57	0.31	1.64	1.69	12.86	8.08
11	116.22	30.95	<b>85.47</b>	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	<b>86.89</b>	48.94	0.28	0.41	0.70	0.57	1.43	2.26	19.96	10.43
35	78.03	5.28	<b>142.87</b>	27.55	0.31	0.30	0.76	0.47	1.56	2.54	22.06	13.89
136	69.34	10.23	<b>105.04</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>396.26</b>	161.77	<b>388.92</b>	301.10	1.80	1.08	2.00	1.50	68.05	46.02	98.86	75.87
4	<b>500.16</b>	165.23	<b>196.27</b>	86.43	1.98	0.94	0.62	<0.1	71.58	47.87	19.95	0.52
7	<b>336.58</b>	217.52	<b>163.68</b>	34.40	1.31	0.71	0.60	<0.1	53.30	34.90	24.31	1.81
11	<b>363.17</b>	77.67	<b>253.98</b>	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	<b>205.21</b>	23.17	<b>220.40</b>	36.16	0.67	<0.1	0.75	<0.1	25.38	22.27	31.99	8.37
35	<b>278.66</b>	18.82	<b>261.67</b>	27.85	0.52	<0.1	0.86	0.14	27.66	18.42	33.49	5.93
136	<b>323.67</b>	29.18	<b>301.39</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>1092.19</b>	105.30	<b>1133.31</b>	287.63	<b>4.93</b>	0.12	6.52	2.00	238.90	14.77	<b>342.76</b>	118.28
4	<b>996.95</b>	38.53	<b>790.43</b>	333.76	<b>4.75</b>	0.35	4.42	2.90	231.21	36.81	<b>212.06</b>	111.40
7	<b>970.35</b>	180.39	<b>633.14</b>	424.39	<b>5.24</b>	<0.1	3.13	3.04	256.21	23.45	<b>163.88</b>	146.67
11	<b>995.71</b>	155.22	<b>758.09</b>	421.94	<b>4.95</b>	0.21	3.01	3.00	241.72	13.55	146.08	146.84
18	n.a.	-	n.a.	-	<b>4.87</b>	0.88	2.84	2.58	235.92	3.43	129.89	126.63
25	<b>854.16</b>	85.00	<b>689.23</b>	307.74	4.32	<0.1	2.95	2.46	226.54	12.85	140.49	115.83
35	<b>1011.01</b>	162.35	<b>775.51</b>	309.54	3.82	0.12	3.69	2.82	211.71	7.53	<b>169.85</b>	120.27
136	<b>826.72</b>	70.00	<b>744.67</b>	177.30	1.57	1.06	3.23	1.39	132.70	95.16	<b>158.27</b>	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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	1.12	<b>2.24</b>	<4.4	-	1.08	<b>2.16</b>	1.17	<b>2.34</b>
4	1.98	<b>3.08</b>	<4.4	-	1.49	<b>2.85</b>	1.75	<b>2.83</b>
7	1.72	<b>1.41</b>	<4.4	-	1.27	<b>1.91</b>	1.56	<b>1.18</b>
11	1.30	<b>0.87</b>	<4.4	-	<1.0	-	1.01	<b>1.96</b>
18	1.70	<b>1.87</b>	<4.4	-	1.58	<b>1.99</b>	2.20	<b>2.98</b>
25	2.00	<b>2.33</b>	<4.4	-	1.08	<b>1.95</b>	1.49	<b>2.63</b>
35	2.19	<b>0.17</b>	<4.4	-	<1.0	-	<1.0	-
136	1.71	<b>1.87</b>	5.54	<b>3.86</b>	<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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	39.41	<b>35.54</b>	64.35	<b>54.73</b>	<1.0	-	<1.0	-
4	39.87	<b>30.97</b>	6.55	<b>4.93</b>	<1.0	-	<1.0	-
7	20.81	<b>13.31</b>	7.02	<b>4.05</b>	<1.0	-	<1.0	-
11	13.44	<b>2.06</b>	6.32	<b>2.24</b>	<1.0	-	<1.0	-
18	8.81	<b>3.39</b>	5.95	<b>0.10</b>	1.14	<b>&lt;1.0</b>	1.43	<b>&lt;1.0</b>
25	4.38	<b>2.29</b>	6.76	<b>0.37</b>	<1.0	-	1.09	<b>&lt;1.0</b>
35	4.20	<b>2.00</b>	<4.4	-	<1.0	-	1.40	<b>&lt;1.0</b>
136	2.46	<b>0.21</b>	5.02	<b>3.40</b>	1.21	<b>&lt;1.0</b>	6.56	<b>6.80</b>

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).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
0.08	<b>140.38</b>	<b>17.72</b>	<b>215.00</b>	<b>102.17</b>	<1.0	-	<1.0	-
4	<b>136.12</b>	<b>13.73</b>	<b>137.30</b>	<b>77.05</b>	<1.0	-	1.49	<b>&lt;1.0</b>
7	<b>144.27</b>	<b>7.99</b>	<b>105.30</b>	<b>91.71</b>	1.02	<b>&lt;1.0</b>	1.49	<b>&lt;1.0</b>
11	<b>121.56</b>	<b>4.17</b>	79.60	<b>76.35</b>	<1.0	-	1.88	<b>&lt;1.0</b>
18	<b>114.09</b>	<b>26.73</b>	63.85	<b>64.27</b>	1.75	<b>&lt;1.0</b>	3.79	<b>&lt;1.0</b>
25	<b>87.62</b>	<b>21.24</b>	56.16	<b>46.19</b>	<1.0	-	2.92	<b>2.02</b>
35	<b>67.20</b>	<b>25.27</b>	54.89	<b>40.79</b>	1.77	<b>&lt;1.0</b>	4.43	<b>2.23</b>
136	10.10	<b>3.73</b>	12.91	<b>8.98</b>	2.98	<b>1.56</b>	<b>13.16</b>	<b>&lt;1.0</b>

\* 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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
0.08	15.8	0.5	1355.6	73.4	133	7	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	7
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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	7	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>1.800</b>	0.020
11	0.010	<0.005	0.040	0.040	0.860	0.080	<b>2.500</b>	0.060
18	0.005	0.010	0.035	0.050	0.965	0.570	<b>2.800</b>	0.340
25	0.020	0.020	0.045	0.030	0.925	1.330	<b>3.815</b>	0.270
35	0.015	0.010	0.030	<0.005	1.255	1.170	<b>3.905</b>	0.630
136	0.010	<0.005	0.025	0.010	<b>5.375</b>	0.570	<b>6.420</b>	1.560

Table 9-717. Selected nutrients in the pore-water (3-5 cm) after inundation of the Pottaloch Station soil material (Site 14): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.055	0.050	0.015	0.030	<b>14.600</b>	4.620	<b>13.090</b>	2.240
4	0.080	0.020	0.140	0.120	<b>8.265</b>	6.610	<b>4.580</b>	1.040
7	0.040	0.060	0.305	0.470	<b>7.310</b>	7.020	<b>8.280</b>	4.940
11	0.705	1.410	0.445	0.430	<b>6.280</b>	8.120	<b>8.645</b>	5.610
18	0.550	1.020	0.525	0.850	<b>10.230</b>	6.320	<b>9.330</b>	0.760
25	0.060	0.100	0.460	0.760	<b>7.990</b>	11.180	<b>10.615</b>	1.930
35	0.090	0.060	0.135	0.150	<b>10.020</b>	12.140	<b>9.405</b>	0.030
136	0.305	0.390	0.695	0.410	<b>8.050</b>	3.840	<b>10.825</b>	2.670

Table 9-718. Selected nutrients in the pore-water (10-12 cm) after inundation of the Pottaloch Station soil material (Site 14): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		2.300		1.700	
0.08	0.070	0.020	0.065	0.030	<b>19.030</b>	1.700	<b>16.615</b>	3.230
4	0.120	<0.005	0.135	0.010	<b>17.335</b>	1.690	<b>14.800</b>	2.240
7	0.090	0.020	0.080	0.020	<b>17.290</b>	1.140	<b>13.725</b>	2.290
11	0.215	0.150	0.290	0.260	<b>16.885</b>	1.110	<b>16.050</b>	3.580
18	0.240	0.200	0.730	0.760	<b>16.900</b>	1.680	<b>14.605</b>	4.250
25	0.310	0.240	0.865	0.610	<b>17.310</b>	1.280	<b>17.090</b>	3.140
35	0.245	0.150	0.490	0.040	<b>18.110</b>	1.880	<b>16.505</b>	4.010
136	0.305	0.050	0.445	0.010	<b>19.485</b>	0.010	<b>20.520</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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	<0.01	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		n.a.	
0.08	101.29	21.71	84.73	38.30	184.57	43.16	102.17	117.82	<b>8.67</b>	0.16	6.40	3.10
4	86.39	6.79	62.24	17.33	254.09	17.60	100.55	68.82	<b>7.71</b>	1.31	4.45	1.32
7	91.29	17.26	59.39	13.87	406.11	41.19	190.84	109.10	<b>8.49</b>	0.34	4.64	1.04
11	82.09	2.61	52.92	20.92	544.32	97.41	313.39	167.25	<b>8.20</b>	2.24	4.20	1.79
18	43.42	6.37	35.27	22.61	630.16	23.11	448.39	160.87	<b>7.14</b>	0.44	3.48	1.89
25	36.69	4.02	26.71	19.73	768.21	22.25	536.76	168.77	<b>6.93</b>	0.91	3.31	1.70
35	26.20	2.14	16.88	16.15	943.69	74.68	641.15	147.01	<b>6.98</b>	0.95	3.26	1.37
136	0.45	0.33	0.65	1.02	1291.38	57.59	1009.92	283.07	<b>4.18</b>	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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	1.14	0.49	<15.0	-	<b>23.35</b>	43.07	3.80	0.01	2.22	0.78	<5.0	-
4	<1.0	-	15.27	6.41	<b>25.08</b>	45.91	<b>18.60</b>	26.07	2.23	0.12	11.28	0.03
7	<1.0	-	<15.0	-	<b>56.71</b>	107.51	<b>20.49</b>	21.05	3.46	0.34	17.80	4.77
11	<1.0	-	<15.0	-	<b>52.96</b>	101.25	<b>19.05</b>	20.97	3.49	0.55	19.82	7.93
18	<1.0	-	25.76	3.26	<b>45.92</b>	86.08	<b>22.07</b>	29.16	3.87	0.07	21.05	10.23
25	1.45	1.29	34.39	0.19	<b>50.38</b>	96.48	<b>26.77</b>	38.22	4.94	1.20	27.40	12.21
35	<1.0	-	<15.0	-	<b>93.92</b>	182.39	<b>32.51</b>	42.54	5.38	1.51	24.21	6.27
136	1.59	1.04	40.79	6.72	<b>316.57</b>	626.42	<b>25.67</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	11.95	4.64	<15.0	-	<b>1820.88</b>	3470.03	<b>403.71</b>	659.54	<b>163.21</b>	32.34	111.66	18.79
4	6.58	4.56	20.04	3.82	<b>623.41</b>	1196.86	<b>35.64</b>	35.71	69.04	38.20	16.27	18.11
7	14.95	21.71	37.87	16.08	<b>412.35</b>	799.29	<b>9.64</b>	4.26	54.79	50.59	15.10	13.96
11	54.26	97.16	52.88	30.06	<b>135.73</b>	263.70	4.85	3.40	33.26	43.24	16.74	25.15
18	53.76	64.01	88.45	26.68	<b>26.30</b>	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	<b>12.43</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	360		n.a.		13		8		88.4		560	
0.08	19.19	3.50	<15.0	-	<b>380.88</b>	194.33	<b>1482.49</b>	2706.82	<b>401.05</b>	68.61	310.26	134.34
4	18.07	5.24	<15.0	-	<b>405.01</b>	433.49	<b>977.79</b>	1691.79	<b>366.53</b>	24.26	218.58	47.03
7	37.60	5.49	19.14	0.02	<b>472.06</b>	625.75	<b>849.30</b>	1399.39	<b>385.07</b>	58.59	218.36	42.57
11	65.71	22.95	37.91	7.24	<b>557.15</b>	938.76	<b>610.68</b>	1028.54	<b>368.47</b>	35.67	183.59	78.21
18	93.79	32.67	91.28	13.53	<b>435.42</b>	780.26	<b>290.06</b>	516.45	<b>317.52</b>	10.14	148.66	78.37
25	113.19	37.23	118.48	15.87	<b>398.58</b>	774.64	<b>125.64</b>	226.85	<b>302.74</b>	2.73	141.33	73.70
35	132.74	31.05	86.05	8.26	<b>180.79</b>	349.28	<b>22.40</b>	26.99	<b>286.27</b>	6.84	132.49	60.62
136	21.03	4.63	66.55	16.82	2.14	4.28	<b>9.62</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>102.90</b>	21.12	0.29	<0.1	0.27	0.10	<1.0	-	11.21	1.07
7	<b>181.33</b>	283.93	<b>86.86</b>	37.89	0.26	0.16	0.23	<0.1	2.07	0.59	16.40	5.73
11	<b>181.48</b>	202.65	<b>101.87</b>	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	<b>245.48</b>	448.57	<b>122.81</b>	83.09	0.30	0.32	0.32	<0.1	4.10	1.02	27.05	10.44
35	<b>383.24</b>	610.80	<b>169.32</b>	121.43	0.37	0.25	0.32	<0.1	4.92	1.24	33.10	4.28
136	<b>608.61</b>	1108.87	<b>141.03</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>1078.16</b>	1325.62	<b>490.14</b>	482.29	1.99	0.74	1.21	0.56	166.58	36.53	115.36	18.63
4	<b>832.97</b>	723.85	<b>236.42</b>	60.13	1.35	0.65	0.39	<0.1	67.14	41.26	22.05	15.33
7	<b>607.48</b>	855.95	<b>176.41</b>	79.26	0.90	0.66	0.27	<0.1	59.67	60.69	23.55	10.07
11	<b>649.43</b>	826.24	<b>222.96</b>	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	<b>241.74</b>	208.81	<b>207.06</b>	158.18	0.33	<0.1	0.35	0.26	32.85	30.73	56.06	56.09
35	<b>239.48</b>	51.99	<b>277.22</b>	87.89	0.16	<0.1	0.38	<0.1	32.32	14.64	57.61	35.00
136	156.86	0.30	<b>329.00</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	<b>867.05</b>	28.33	<b>1517.85</b>	2358.54	2.81	0.38	2.40	1.86	423.94	52.26	<b>341.96</b>	151.45
4	<b>947.19</b>	279.77	<b>1056.58</b>	1348.65	2.40	0.45	1.60	0.47	390.81	7.91	<b>235.41</b>	57.77
7	<b>954.96</b>	668.70	<b>1099.13</b>	1278.33	2.62	0.69	1.61	0.92	452.28	53.51	<b>239.70</b>	46.75
11	<b>1345.06</b>	1138.89	<b>1208.75</b>	1541.34	2.99	1.92	1.74	1.20	421.92	49.31	<b>219.25</b>	88.91
18	n.a.	-	n.a.	-	2.73	1.95	1.28	1.07	360.88	24.54	<b>176.03</b>	94.21
25	<b>2004.85</b>	2685.69	<b>979.37</b>	1034.35	3.15	2.50	1.16	1.10	345.95	19.09	<b>169.70</b>	83.29
35	<b>2668.15</b>	3780.36	<b>883.50</b>	626.70	3.70	3.87	0.96	0.83	333.13	15.88	<b>176.48</b>	78.32
136	<b>554.80</b>	337.79	<b>422.24</b>	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 Pottaloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	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	<b>1.10</b>	<4.4	-	<1.0	-	<1.0	-
18	<1.0	-	<4.4	-	<1.0	-	<1.0	-
25	1.17	<b>0.77</b>	<4.4	-	<1.0	-	<1.0	-
35	1.24	<b>0.05</b>	<4.4	-	<1.0	-	1.21	<1.0
136	1.93	<b>1.20</b>	4.91	<b>2.42</b>	2.18	<b>2.28</b>	1.65	<b>1.54</b>

Table 9-729. Selected metals in the pore-water (3-5 cm) after inundation of the Pottaloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<b>91.12</b>	<b>34.80</b>	79.26	<b>24.42</b>	<b>377.59</b>	<b>754.35</b>	4.63	<b>5.37</b>
4	30.17	<b>20.65</b>	6.36	<b>9.19</b>	53.43	<b>105.04</b>	4.45	<b>4.28</b>
7	20.77	<b>26.38</b>	<4.4	-	36.97	<b>72.24</b>	3.15	<b>3.20</b>
11	11.69	<b>20.44</b>	4.54	<b>6.51</b>	24.25	<b>47.91</b>	3.27	<b>1.82</b>
18	8.92	<b>5.80</b>	8.53	<b>16.77</b>	17.69	<b>33.22</b>	7.15	<b>4.34</b>
25	4.62	<b>4.54</b>	7.74	<b>15.48</b>	3.80	<b>7.11</b>	6.22	<b>5.91</b>
35	4.94	<b>2.67</b>	<4.4	-	2.31	<b>3.24</b>	6.22	<b>5.16</b>
136	3.57	<b>1.33</b>	<4.4	-	1.38	<b>1.74</b>	<b>16.49</b>	<b>1.51</b>

Table 9-730. Selected metals in the pore-water (10-12 cm) after inundation of the Pottaloch Station soil material (Site 14): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	40		85		110.9		12	
0.08	<b>184.09</b>	<b>20.09</b>	<b>166.85</b>	<b>101.85</b>	3.11	<b>3.73</b>	<b>2.67</b>	<1.0
4	<b>165.71</b>	<b>2.67</b>	<b>116.83</b>	<b>48.95</b>	2.16	<1.0	<b>23.91</b>	<b>39.71</b>
7	<b>167.66</b>	<b>20.66</b>	<b>112.61</b>	<b>32.58</b>	2.75	<1.0	10.07	<b>11.23</b>
11	<b>145.48</b>	<b>16.93</b>	<b>99.01</b>	<b>43.72</b>	5.54	<1.0	6.82	<b>4.64</b>
18	<b>112.22</b>	<b>10.54</b>	<b>77.28</b>	<b>46.70</b>	9.26	<1.0	<b>15.43</b>	<b>2.84</b>
25	<b>83.08</b>	<b>4.76</b>	59.21	<b>37.51</b>	9.07	<1.0	<b>20.75</b>	<b>2.79</b>
35	<b>59.19</b>	<b>2.90</b>	45.79	<b>30.81</b>	11.13	<b>1.43</b>	<b>26.55</b>	<b>4.07</b>
136	7.53	<b>0.72</b>	<4.4	-	1.10	<1.0	3.14	<b>2.60</b>

\* 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 Pottaloch Station soil material (Site 14): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 14): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): pH, Eh, and alkalinity.

Days	pH				Eh (mV)				Alkalinity (mmol/L)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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.

Days	Fe(II) (ppm)				Fe(III) (ppm)				Dissolved Organic C (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.095	<i>0.011</i>	0.068	<i>0.064</i>	0.026	<i>0.011</i>	0.032	<i>&lt;0.005</i>
4	0.110	<i>0.040</i>	0.188	<i>0.036</i>	0.005	<i>0.010</i>	0.007	<i>0.006</i>
7	0.175	<i>0.030</i>	0.305	<i>0.190</i>	0.015	<i>0.010</i>	0.100	<i>0.120</i>
11	0.255	<i>0.010</i>	0.420	<i>0.280</i>	0.005	<i>0.010</i>	0.025	<i>0.010</i>
18	0.450	<i>0.300</i>	0.725	<i>0.310</i>	0.020	<i>&lt;0.005</i>	0.150	<i>0.040</i>
25	0.390	<i>0.060</i>	0.235	<i>0.130</i>	<i>&lt;0.005</i>	-	0.030	<i>0.040</i>
35	0.440	<i>0.040</i>	0.420	<i>0.080</i>	0.005	<i>0.010</i>	0.010	<i>0.020</i>
136	0.470	<i>0.100</i>	1.760	<i>0.260</i>	<i>&lt;0.005</i>	-	<i>&lt;0.005</i>	-

Table 9-744. Selected nutrients in the pore-water (3-5 cm) after inundation of the Pottaloch Station soil material (Site 15): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.585	<i>0.750</i>	1.025	<i>1.330</i>	0.040	<i>&lt;0.005</i>	0.030	<i>0.020</i>
4	0.025	<i>0.050</i>	0.129	<i>0.157</i>	0.015	<i>0.010</i>	0.007	<i>0.007</i>
7	0.060	<i>&lt;0.005</i>	0.160	<i>0.080</i>	0.020	<i>0.020</i>	0.030	<i>0.020</i>
11	0.145	<i>0.030</i>	0.260	<i>0.040</i>	0.005	<i>0.010</i>	0.030	<i>0.020</i>
18	0.085	<i>0.030</i>	n.a.	-	0.015	<i>0.010</i>	n.a.	-
25	0.125	<i>0.050</i>	0.135	<i>0.190</i>	0.005	<i>0.010</i>	0.010	<i>0.020</i>
35	0.145	<i>0.050</i>	0.175	<i>0.130</i>	0.020	<i>0.020</i>	0.030	<i>0.020</i>
136	<i>&lt;0.005</i>	-	0.365	<i>0.190</i>	0.005	<i>0.010</i>	0.020	<i>0.020</i>

Table 9-745. Selected nutrients in the pore-water (10-12 cm) after inundation of the Pottaloch Station soil material (Site 15): NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup>. (The values in bold red text exceed the relevant water quality guideline).

Days	NO <sub>3</sub> <sup>-</sup> (ppm N)				NO <sub>2</sub> <sup>-</sup> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	17		n.a.		n.a.		n.a.	
0.08	0.285	<i>0.230</i>	0.535	<i>0.790</i>	0.190	<i>0.060</i>	0.080	<i>0.020</i>
4	<i>&lt;0.005</i>	-	0.055	<i>0.110</i>	0.130	<i>&lt;0.005</i>	0.040	<i>0.080</i>
7	0.045	<i>0.010</i>	0.025	<i>0.010</i>	0.105	<i>0.070</i>	0.055	<i>0.050</i>
11	0.080	<i>0.020</i>	0.140	<i>0.180</i>	0.030	<i>0.020</i>	0.040	<i>0.020</i>
18	0.025	<i>0.030</i>	n.a.	-	0.090	<i>0.040</i>	n.a.	-
25	0.080	<i>0.020</i>	0.050	<i>0.040</i>	0.025	<i>0.010</i>	0.035	<i>0.030</i>
35	0.115	<i>0.130</i>	0.205	<i>0.230</i>	0.045	<i>0.030</i>	0.055	<i>0.010</i>
136	0.035	<i>0.070</i>	0.120	-	0.005	<i>0.010</i>	0.030	<i>0.020</i>

\* 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 Pottaloch Station soil material (Site 15): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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 Pottaloch Station soil material (Site 15): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
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 Pottaloch Station soil material (Site 15): PO<sub>4</sub><sup>3-</sup> and NH<sub>3</sub>. (The values in bold red text exceed the relevant water quality guideline).

Days	PO <sub>4</sub> <sup>3-</sup> (ppm P)				NH <sub>3</sub> (ppm N)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	n.a.		n.a.		<b>2.300</b>		<b>1.700</b>	
0.08	0.025	0.010	0.040	0.020	<b>2.735</b>	0.850	<b>2.125</b>	3.230
4	0.145	0.050	0.100	0.200	<b>3.675</b>	0.810	<b>1.830</b>	0.220
7	0.075	0.090	0.055	0.030	<b>3.430</b>	1.800	<b>2.640</b>	0.560
11	0.055	0.030	0.085	0.050	<b>3.290</b>	1.740	<b>3.675</b>	1.370
18	0.075	0.070	n.a.	-	<b>3.870</b>	1.920	n.a.	-
25	0.030	0.020	0.040	0.020	<b>4.270</b>	1.880	<b>3.335</b>	1.070
35	0.035	0.010	0.035	0.010	<b>5.420</b>	0.780	<b>4.210</b>	0.220
136	0.050	0.060	0.055	0.010	<b>6.850</b>	2.700	<b>3.500</b>	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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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).

Days	Al (ppm)				Fe (ppm)				Mn (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>0.150</b> <sup>1</sup>		n.a.		n.a.		n.a.		<b>3.60</b>		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). <sup>1</sup> 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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	<b>10.54</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	-	<b>10.79</b>	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).

Days	As (ppb)				Cu (ppb)				Ni (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	<b>360</b>		n.a.		<b>13</b>		<b>8</b>		<b>88.4</b>		<b>560</b>	
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	-	<b>13.09</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>65.82</b>	-	<0.1	-	0.20	0.12	<1.0	-	2.99	0.31
7	24.97	0.60	<b>45.66</b>	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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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	<b>71.90</b>	37.66	<0.1	-	0.19	<0.1	6.67	8.01	12.42	18.06
7	27.42	13.87	<b>46.35</b>	8.51	<0.1	-	0.17	<0.1	6.95	9.67	20.14	28.27
11	57.71	72.48	<b>52.17</b>	-	<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).

Days	Zn (ppb)				Cd (ppb)				Co (ppb)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG	161.2		43		4.6		36		n.a.		150	
0.08	62.43	7.49	<b>45.34</b>	11.40	<0.1	-	<0.1	-	6.07	7.30	16.21	30.91
4	40.43	-	<b>121.82</b>	55.39	<0.1	-	0.17	<0.1	10.26	10.35	17.06	4.21
7	33.68	4.91	<b>76.74</b>	26.32	<0.1	-	0.18	<0.1	6.93	4.43	17.80	4.99
11	55.13	20.83	<b>152.85</b>	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	<b>45.44</b>	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 Pottaloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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 Pottaloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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 Pottaloch Station soil material (Site 15): Cr and Pb. (The values in bold red text exceed the relevant water quality guideline).

Days	Cr (ppb)				Pb (ppb)			
	River Murray		Seawater		River Murray		Seawater	
	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>40</b>		<b>85</b>		<b>110.9</b>		<b>12</b>	
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 Pottaloch Station soil material (Site 15): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 Pottaloch Station soil material (Site 15): Na<sup>+</sup>, K<sup>+</sup>, and Ca<sup>2+</sup>.

Days	Na <sup>+</sup> (ppm)				K <sup>+</sup> (ppm)				Ca <sup>2+</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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<sup>2+</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>.

Days	Mg <sup>2+</sup> (ppm)				Cl <sup>-</sup> (ppm)				SO <sub>4</sub> <sup>2-</sup> (ppm)			
	River Murray		Seawater		River Murray		Seawater		River Murray		Seawater	
	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 ( $\times 10^{-3}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	-4.3	23.5	<b>80.8</b>	<b>308.0</b>	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	<b>44.1</b>	<b>476.0</b>	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	<b>30.8</b>	<b>230.3</b>	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	<b>40.4</b>	<b>184.6</b>	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	<b>168.6</b>	3.8	-95.3	-42.2	-18.2	<b>30.2</b>	9.5	1.8	7.5	1.1	0.0
6	-12.9	-98.2	<b>34.2</b>	<b>97.7</b>	-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	<b>25.2</b>	<b>111.2</b>	-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	<b>25.0</b>	<b>36.7</b>	-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	<b>33.0</b>	<b>88.1</b>	-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	<b>34.6</b>	<b>42.8</b>	-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	<b>68.2</b>	<b>66.0</b>	-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	<b>120.5</b>	<b>124.7</b>	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	<b>26.3</b>	<b>11.0</b>	-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	<b>88.1</b>	-6.4	-91.3	-51.3	-32.7	-40.3	-10.6	0.2	1.9	<b>0.2</b>	-1.2	-1.1
15	-32.4	7.9	<b>77.9</b>	<b>48.5</b>	-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 ( $\times 10^{-3}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	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	<b>2.59</b>	0.99	0.55	<b>2.60</b>	-0.68	-0.57	-0.07	0.09
2	0.25	<b>2.43</b>	<b>0.71</b>	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	<b>0.25</b>	-0.03	0.00	0.02	0.05	<b>1.12</b>	-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	<b>0.83</b>	0.31	-0.13	<b>1.24</b>	-0.01	0.04
5	0.33	<b>8.53</b>	<b>0.68</b>	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	<b>1.26</b>	-0.08	0.38	-0.03	0.34	0.17	-0.01	<b>1.28</b>	0.01	0.49
7	0.16	-0.11	0.14	0.21	<b>0.80</b>	0.24	0.44	-0.06	0.63	<b>0.38</b>	0.21	0.27	0.17	0.24
8	0.15	0.04	0.54	0.09	<b>1.42</b>	-0.05	0.70	0.05	0.46	<b>0.11</b>	0.08	-0.08	0.09	-0.01
9	0.30	<b>3.99</b>	<b>0.71</b>	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	<b>3.35</b>	0.35	1.82	0.15	0.47	7.61	-0.43	<b>13.48</b>	0.16	0.07
11	-28.13	<b>14.43</b>	0.23	1.89	<b>0.94</b>	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	<b>0.99</b>	0.12	0.90	<b>2.74</b>	-0.16	-0.07
13	-0.01	-0.30	0.29	<b>0.26</b>	0.19	-0.08	0.35	0.06	0.46	-0.06	<b>0.63</b>	0.04	-0.03	0.00
14	0.01	-0.08	0.43	<b>0.50</b>	0.29	-0.03	0.90	-0.17	<b>1.21</b>	0.14	0.66	0.44	-0.24	-0.05
15	0.08	0.66	0.46	0.84	0.43	0.62	<b>0.60</b>	<b>0.93</b>	-0.18	-1.50	0.11	0.40	0.01	0.28



Table 9-769. Summary of NH<sub>3</sub> apparent net diffusion rates after River Murray and seawater inundation (x 10<sup>-3</sup> moles m<sup>-2</sup> day<sup>-1</sup>). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	1.64	2.13	<b>7.61</b>	3.46	-1.82	1.37	-3.26	<b>15.29</b>	-0.20	-9.35	-0.02	-6.76	0.06	-0.01
2	-0.22	-0.41	<b>2.21</b>	<b>1.07</b>	-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	<b>3.57</b>	0.43	-1.74	<b>1.10</b>	0.54	0.12	-0.93	1.07	-0.09	-0.45	0.05	-0.09
4	-0.79	0.25	<b>3.89</b>	0.43	-1.55	<b>2.87</b>	2.05	-0.67	-2.83	1.01	-0.02	-0.93	0.05	-0.06
5	-0.77	0.49	<b>2.89</b>	0.75	-1.85	<b>1.13</b>	1.29	-0.55	-1.38	0.66	-0.03	-0.80	0.05	-0.01
6	-0.71	<b>2.43</b>	<b>3.36</b>	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	<b>3.43</b>	1.00	-2.33	<b>2.12</b>	1.76	-0.02	-1.94	1.42	-0.04	-0.28	0.05	0.04
8	-0.16	<b>5.74</b>	<b>3.46</b>	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	<b>2.79</b>	0.46	-1.90	<b>0.99</b>	1.29	-0.26	-1.32	0.78	-0.01	-0.72	0.05	-0.03
10	1.97	<b>19.59</b>	<b>4.29</b>	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	<b>3.39</b>	0.07	-2.46	0.21	0.02	-1.12	-0.28	<b>0.72</b>	-0.01	-0.70	0.00	0.00
12	3.39	5.20	<b>8.71</b>	6.64	3.59	<b>8.12</b>	7.03	2.56	-1.79	3.47	0.09	-1.76	-0.95	-0.96
13	-0.38	<b>2.63</b>	<b>3.36</b>	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	<b>6.54</b>	<b>3.61</b>	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	<b>1.91</b>	<b>2.57</b>	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<sup>-6</sup> moles m<sup>-2</sup> day<sup>-1</sup>). (The values in bold red text show the maximum diffusion rate after River Murray (RM) and seawater (SW) inundation for each site).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	0.57	0.06	<b>2.68</b>	<b>4.41</b>	-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	<b>3.62</b>	-0.28	2.52	-0.60	-1.29	<b>0.81</b>	1.18	0.01	-1.97	0.04	0.63
3	1.44	-0.57	1.49	<b>6.22</b>	0.08	2.37	-0.03	1.57	<b>1.62</b>	0.27	0.86	-2.85	0.69	1.55
4	-0.05	-0.75	<b>1.14</b>	<b>2.12</b>	-0.31	1.73	-0.41	-1.34	0.82	1.46	-0.46	-1.59	0.10	0.73
5	-0.50	<b>30.08</b>	<b>1.70</b>	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	<b>87.91</b>	<b>0.88</b>	-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	<b>17.67</b>	<b>1.21</b>	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	<b>13.41</b>	<b>1.66</b>	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	<b>3.81</b>	<b>0.51</b>	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	<b>43.70</b>	-0.20	0.13	0.08	1.90	-0.25	-4.27	<b>0.24</b>	5.82	-0.20	-7.49	0.01	-0.21
11	-3.25	<b>6.25</b>	<b>0.51</b>	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	<b>2.55</b>	0.66	1.87	-0.38	-1.17	-0.29	0.85	<b>0.96</b>	1.41	-0.50	-2.75	0.05	0.61
13	1.16	<b>30.96</b>	<b>2.38</b>	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	<b>13.16</b>	<b>2.10</b>	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	<b>6.26</b>	<b>2.12</b>	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 ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	-0.48	0.01	<b>2.70</b>	<b>4.57</b>	-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	<b>1.46</b>	<b>4.58</b>	-0.32	0.37	0.06	-0.08	0.08	0.24	0.23	-0.40	-0.04	-0.11
3	-0.54	<b>3.44</b>	1.05	0.60	-0.22	-1.90	0.36	0.97	<b>1.62</b>	0.03	-0.75	-0.86	-0.19	0.03
4	-0.84	-0.42	<b>2.40</b>	<b>4.45</b>	-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	<b>1.93</b>	<b>3.85</b>	-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	<b>2.73</b>	<b>4.22</b>	-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	<b>2.35</b>	<b>5.91</b>	-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	<b>3.17</b>	<b>8.05</b>	-1.65	0.35	0.06	-2.23	0.19	0.30	-0.19	-0.95	-0.05	0.61
9	<b>1.50</b>	0.13	-1.34	<b>3.07</b>	-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	<b>1.05</b>	<b>8.84</b>	-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	<b>6.94</b>	-0.25	-1.96	<b>1.39</b>	-0.67	-0.99	-0.67	0.16	0.33	-0.05	-0.02
12	-2.75	-0.68	<b>1.15</b>	<b>1.74</b>	0.47	-2.30	-0.20	0.40	0.06	0.15	-0.18	0.25	-0.05	0.01
13	<b>1.71</b>	-0.31	-1.20	<b>5.74</b>	0.03	-1.86	0.04	-0.56	1.22	-0.20	-0.65	1.06	0.09	0.22
14	2.09	<b>17.83</b>	<b>49.78</b>	2.98	-4.44	-1.70	-4.75	2.04	3.01	3.17	20.55	2.71	10.41	-0.32
15	<b>1.39</b>	-1.29	-0.15	<b>2.52</b>	-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 ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	0.54	-14.74	<b>1.63</b>	6.18	1.51	3.48	-0.17	3.53	-0.35	<b>10.19</b>	0.24	-15.88	0.02	1.43
2	0.45	-7.84	-0.95	-3.29	<b>1.03</b>	7.69	0.15	2.38	-0.20	<b>10.39</b>	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	<b>12.24</b>	<b>0.59</b>	-14.88	0.19	1.30
4	0.40	-7.91	-0.45	-0.39	<b>0.66</b>	-2.27	-0.10	3.64	-0.06	<b>13.43</b>	0.52	-10.71	0.05	1.38
5	-0.42	-15.99	<b>0.44</b>	3.06	0.31	0.01	0.08	4.46	-0.33	<b>14.71</b>	0.29	-13.89	0.02	1.07
6	-0.33	1.89	-0.14	-14.88	<b>0.47</b>	2.81	-0.32	4.71	0.12	<b>11.62</b>	0.16	-13.04	0.01	1.39
7	0.45	6.18	-1.12	-20.37	<b>0.49</b>	3.99	-0.27	<b>7.51</b>	-0.32	5.17	0.42	-11.04	0.03	1.36
8	<b>0.81</b>	7.64	0.23	-9.36	0.63	-2.39	-0.71	6.46	-0.49	<b>8.34</b>	0.52	-11.68	0.00	1.37
9	-0.58	4.20	<b>0.68</b>	-7.48	0.56	-2.31	-0.23	8.91	-0.34	<b>9.60</b>	0.10	-13.83	0.04	1.74
10	-0.30	2.34	<b>0.83</b>	-6.23	-0.38	4.73	-0.02	4.90	0.37	<b>16.94</b>	-0.15	-18.76	0.01	1.83
11	-2.69	9.94	<b>1.22</b>	-8.99	0.33	-1.32	0.46	7.76	0.54	<b>11.54</b>	-0.31	-14.61	-0.01	1.67
12	1.82	15.43	<b>4.09</b>	1.02	1.86	<b>17.79</b>	0.45	5.63	1.25	11.36	-0.93	-16.48	0.49	1.00
13	-0.26	<b>12.95</b>	0.38	-5.59	0.12	5.62	-0.55	3.98	<b>0.43</b>	9.56	-0.32	-16.62	0.02	1.65
14	-0.64	<b>7.51</b>	<b>0.59</b>	-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	<b>1.47</b>	0.98	-0.65	6.19	0.57	1.69	0.41	<b>9.35</b>	-0.49	-15.40	0.04	1.53

Table 9-773. Summary of Cd apparent net diffusion rates after River Murray and seawater inundation ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	-0.03	-0.19	<b>0.13</b>	<b>0.04</b>	-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	<b>0.08</b>	<b>0.11</b>	-0.01	0.04	-0.01	-0.05	0.01	0.00	-0.02	-0.01	0.00	0.00
3	0.06	<b>0.09</b>	<b>0.12</b>	-0.04	-0.04	0.01	0.03	-0.01	-0.03	0.02	0.03	0.01	-0.01	0.00
4	<b>0.03</b>	0.02	0.00	0.02	0.03	<b>0.05</b>	-0.02	-0.02	0.00	0.01	-0.01	0.01	0.00	0.00
5	-0.01	<b>2.89</b>	<b>0.04</b>	0.62	0.02	-0.05	-0.02	-0.55	0.01	0.02	-0.01	-0.07	0.00	-0.04
6	<b>0.03</b>	<b>0.56</b>	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	<b>0.12</b>	<b>0.04</b>	-0.03	0.00	0.04	-0.02	0.06	0.00	-0.05	0.00	0.06	0.00	0.00
8	<b>0.16</b>	<b>0.12</b>	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	<b>0.03</b>	<b>0.07</b>	-0.01	-0.04	0.03	0.02	-0.03	0.02	0.00	0.00
10	0.00	<b>0.24</b>	-0.02	-0.08	0.01	0.05	<b>0.02</b>	-0.06	-0.02	0.01	0.01	-0.01	0.00	0.00
11	-0.03	0.07	<b>0.03</b>	<b>0.30</b>	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	<b>0.02</b>	-0.05	0.01	0.01	0.01	-0.04	-0.02	<b>0.02</b>	0.00	0.00
13	0.02	<b>0.21</b>	0.03	0.00	-0.03	0.00	<b>0.04</b>	0.04	-0.04	0.01	0.01	0.02	0.01	0.00
14	0.01	<b>0.14</b>	-0.03	-0.04	<b>0.03</b>	0.01	-0.01	0.00	0.01	0.02	0.02	0.00	0.00	0.00
15	-0.03	<b>0.08</b>	-0.03	-0.08	<b>0.02</b>	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 ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	<b>43.81</b>	12.21	-29.14	26.17	-12.44	-13.15	-7.27	-5.13	23.91	<b>34.15</b>	-2.08	-3.67
2	<b>52.45</b>	<b>18.16</b>	-52.28	4.28	-5.14	-17.82	-5.56	-1.89	23.79	15.73	-2.26	-2.03
3	<b>88.57</b>	<b>37.98</b>	-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	<b>23.04</b>	<b>18.57</b>	-2.23	-2.32
5	<b>43.62</b>	10.67	-21.92	20.16	-5.42	0.27	-9.33	-7.16	25.90	<b>21.86</b>	-2.56	-2.51
6	<b>49.85</b>	<b>142.52</b>	-23.42	-72.30	-18.14	12.71	-6.96	-25.20	19.57	15.49	-2.09	-2.57
7	<b>31.77</b>	-4.52	8.43	<b>62.28</b>	-36.51	-51.12	-4.27	1.04	14.17	26.33	-1.56	-0.76
8	<b>47.37</b>	<b>72.40</b>	-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	<b>26.27</b>	<b>19.27</b>	-2.54	-2.51
10	<b>44.83</b>	<b>42.40</b>	-27.18	-6.56	10.48	-14.47	-10.50	0.00	15.29	16.87	-1.71	-3.29
11	22.54	<b>23.57</b>	<b>37.95</b>	-6.29	-34.50	-0.21	-7.62	-8.06	14.34	17.74	-1.53	-2.22
12	<b>37.81</b>	11.80	-17.84	-8.03	37.32	-4.95	-20.34	-3.89	20.30	<b>14.04</b>	-2.03	-1.67
13	8.70	<b>47.50</b>	8.51	24.33	<b>85.95</b>	8.21	-32.42	0.47	27.88	25.67	-0.39	-1.72
14	<b>74.54</b>	<b>92.00</b>	70.19	-24.53	0.18	17.22	20.97	6.86	63.18	21.33	10.23	-1.28
15	<b>32.16</b>	<b>53.79</b>	-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 ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	<b>0.63</b>	-0.37	0.62	0.00	0.12	0.00	0.04	0.00	0.25	<b>2.02</b>	0.17	-1.42	0.02	0.19
2	<b>0.96</b>	0.00	0.33	0.00	0.56	1.10	-0.33	0.50	0.87	<b>3.57</b>	0.17	-3.29	-0.08	0.20
3	<b>1.83</b>	0.83	-0.49	-2.02	0.71	-0.01	-0.17	<b>1.19</b>	1.50	0.55	-0.86	-1.22	-0.08	0.07
4	0.29	0.00	<b>2.00</b>	<b>2.16</b>	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	<b>1.56</b>	-0.24	1.16	0.35	0.14	0.47	0.07	<b>0.76</b>	-0.94	-1.05	-0.03	0.18
6	0.25	0.00	<b>1.93</b>	0.27	0.96	0.42	0.31	<b>1.16</b>	-0.05	0.83	-0.80	-1.64	0.02	0.24
7	-1.26	0.00	<b>2.96</b>	<b>2.02</b>	-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	<b>3.70</b>	1.06	-1.70	-0.62	-0.51	<b>1.55</b>	0.60	0.68	-0.59	-2.34	-0.04	0.27
9	-0.71	0.00	<b>1.57</b>	<b>1.55</b>	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	<b>1.65</b>	<b>0.74</b>	-1.87	-0.09	0.11
11	-0.44	-1.60	<b>1.32</b>	0.00	0.50	0.39	-0.52	0.74	0.44	<b>0.77</b>	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	<b>1.89</b>	<b>2.14</b>	-0.26	-2.75	-0.06	0.16
13	<b>1.27</b>	-0.54	-0.51	-1.07	-0.60	<b>0.57</b>	0.33	0.11	0.24	0.26	0.11	-0.31	-0.03	0.26
14	-0.60	-1.21	<b>1.08</b>	0.00	0.57	0.39	-0.57	-0.19	0.47	<b>1.62</b>	0.04	-1.06	0.04	0.27
15	-0.39	-0.23	<b>0.84</b>	<b>0.89</b>	-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 ( $\times 10^{-6}$  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).

Site	Day 0 – 4		Day 4 – 7		Day 7 – 11		Day 11 – 18		Day 18 – 25		Day 25 – 35		Day 35 – 136	
	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW	RM	SW
1	0.25	1.73	<b>0.72</b>	<b>2.59</b>	-0.47	-1.70	-0.16	-1.17	0.08	-0.42	-0.01	-0.19	-0.01	0.02
2	<b>0.06</b>	0.00	0.00	<b>1.13</b>	-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	<b>0.35</b>	-0.22	-0.22	0.10	0.05	-0.07	-0.07	<b>0.56</b>	0.05	-0.08	-0.02
4	0.02	-0.21	<b>0.28</b>	-0.12	0.03	<b>0.22</b>	0.09	0.07	-0.09	-0.18	-0.08	-0.07	0.00	0.00
5	0.01	<b>6.70</b>	<b>0.13</b>	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	<b>63.26</b>	<b>0.06</b>	-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	<b>9.44</b>	<b>0.03</b>	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	<b>7.86</b>	<b>1.17</b>	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	<b>0.22</b>	<b>0.39</b>	-0.07	0.34	0.01	-0.27	0.03	0.04	0.00	-0.02	0.00	0.00
10	-0.18	<b>24.99</b>	0.06	0.65	<b>0.07</b>	-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	<b>2.45</b>	<b>1.50</b>	0.72	-0.88	0.89	-0.02	-0.53	0.00	-0.99	0.00	-0.04
12	0.02	<b>0.51</b>	<b>0.16</b>	-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	<b>11.73</b>	<b>0.65</b>	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	<b>13.39</b>	<b>1.98</b>	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	<b>3.67</b>	<b>0.24</b>	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).

Days	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	
	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	-	<b>46</b>	14	<30	-	<30	-	<30	-
11	<30	-	<30	-	<30	-	<30	-	<b>40</b>	44	<30	-
18	<30	-	<30	-	<b>43</b>	47	<30	-	<b>69</b>	24	<30	-
25	<30	-	<30	-	<30	-	<30	-	<b>37</b>	6	<30	-
35	<30	-	<30	-	<30	-	<30	-	<b>34</b>	24	<30	-
136	<30	-	<30	-	<b>34</b>	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).

Days	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	
	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).

Days	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	
	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<sub>2</sub>S. 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).

Days	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	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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).

Days	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	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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).

Days	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	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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).

Days	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	
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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<sub>2</sub>S. 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).

Days	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	
	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).

Days	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	
	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).

Days	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	
	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).

Days	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	
	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<sub>2</sub>S. 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		
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	
Days													
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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		
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	
Days													
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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	-	<b>47</b>	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		
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	
Days													
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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	-	<b>539</b>	1043	283	114	<b>736</b>	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		
	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	Av.	±	
Days													
WQG*	<b>2.6</b>		n.a.		<b>2.6</b>		n.a.		<b>2.6</b>		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	-	<b>36</b>	72	<30	-	

\* Sulfide as un-ionised H<sub>2</sub>S. 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 $^{35}\text{SO}_4^{2-}$ Incubation Method

Table 9-792. Mean sulfate reduction rates for Murray water treatment: depth 0-4 cm (in units of nmol/cm<sup>3</sup>/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/cm<sup>3</sup>/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/cm<sup>3</sup>/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/cm<sup>2</sup>/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

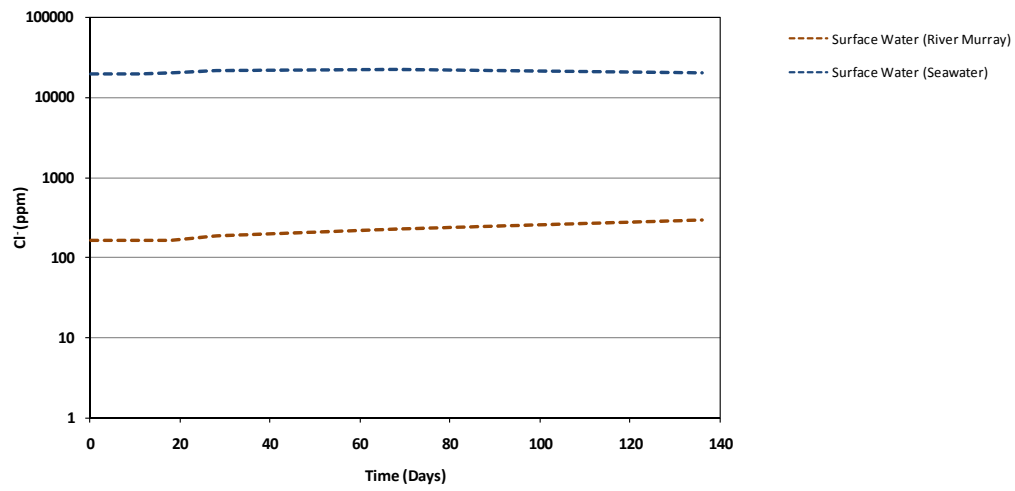


Figure 9-1. Chloride (Cl) concentration of the surface water in columns containing no sediment over 136 days of inundation.

## 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%
<b>Metals &amp; Metalloids</b>				
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 <sup>A</sup>	4.6 <sup>A</sup>	5.5	36
Chromium (Cr VI)	1.0	40	4.4	85
Cobalt	ID	ID	1	150
Copper	7.3 <sup>A</sup>	13 <sup>A</sup>	1.3	8
Lead	40.1 <sup>A</sup>	110.9 <sup>A</sup>	4.4	12
Manganese	1,900	3,600	ID	ID
Nickel	57.2 <sup>A</sup>	88.4 <sup>A</sup>	70	560
Zinc	41.6 <sup>A</sup>	161.2 <sup>A</sup>	15	43
<b>Non-Metallic Inorganics</b>				
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.

