



# Safe Drinking Water Annual Report 2014 - 2015

*Healthy Parks  
Healthy People*





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# 1. Introduction



Parks Victoria is responsible for managing Victoria's National, State, and Regional Parks, Reservoir Parks, some major Metropolitan Parks and conservation reserves, Marine National Parks and Marine Sanctuaries. In addition, Parks Victoria manages many cultural assets such as historic properties and gardens, as well as Port Phillip Bay, Western Port Bay and major waterways. Parks Victoria's role is to protect the natural and cultural values of the parks and other assets, while providing a great range of outdoor opportunities for all Victorians and visitors.

Maintaining the health of Victoria's parks and reserves while providing a range of excellent visitor services not only contributes to the environmental and cultural health of our parks, but also to the physical and social wellbeing of all Victorians.

At two of its visitor sites, Parks Victoria is responsible for providing safe, potable drinking water which meets the requirements set by the *Safe Drinking Water Act 2003* (SDWA) and the *Safe Drinking Water Regulations 2005*. The *Safe Drinking Water Act* requires that an Annual Report, containing information on analysis results, management processes, incident actions and other issues that have arisen in the previous year, be submitted to the Department of Health and Human Services (DHHS) and made publicly available.

Leasees operating food and/or accommodation services on Parks Victoria land have an obligation under the *Public Health and Wellbeing Act 2008* or the *Food Act 1984*, rather than the SDWA, to provide potable water.

## Further Information

For further information on this Annual Report, contact Parks Victoria on 13 1963 or [www.parkweb.vic.gov.au/about-us/publications-list](http://www.parkweb.vic.gov.au/about-us/publications-list) (select annual reports category).

## Characterisation and water source of the systems

From 1 July, 2014 to 30 June, 2015, Parks Victoria managed drinking water supplies at two separate locations as detailed in Table 1.

**Table 1: Description of Parks Victoria's Drinking Water Localities**

| Water Sampling Locality   | Source water      | Treatment   | Description  |
|---|-------------------|---|--|
| Tidal River<br>Wilson's Promontory National Park<br>Seasonal population | Tidal River water | Conventional water treatment plant.<br>Added substances include: <ul style="list-style-type: none"><li>• Aluminium chlorohydrate</li><li>• Soda ash</li><li>• Sodium hypochlorite</li></ul> | Water is harvested from an unconfined 2000ha conservation zone, and then pumped to a treatment plant where it undergoes processes of coagulation, flocculation and clarification, before filtration and disinfection. Treated water is transferred from a single clear water storage tank to twin storage tanks before reticulation by gravity throughout Tidal River. |

| Water Sampling Locality  | Source water                    | Treatment  | Description   |
|--|---------------------------------|--|---|
| Twelve Apostles Visitor Centre<br>Port Campbell National Park<br>Seasonal population | Wannon Water mains <sup>1</sup> | Standard treatment by Wannon Water<br>Secondary treatment by Parks Vic – UV disinfection | Treated water is delivered to the site by a registered commercial tanker operator. Water is pumped from underground storage to elevated storage in the amenity block, UV disinfection is applied and water is then gravity-fed to taps. |

<sup>1</sup> Tankered to Parks Victoria storage by commercial water tanker operator

These two drinking water supplies managed by Parks Victoria were listed as water sampling localities in the Victorian Government Gazette S161 on 22 June 2006, and make up the drinking water supplies which Parks Victoria will report on in this *Safe Drinking Water Annual Report*. On Pages 4 – 5, diagrams show how safe drinking water is treated and supplied at each site.

### Mineral Springs

Parks Victoria also manages a number of mineral springs in Central Victoria, chiefly in Hepburn Regional Park and Castlemaine Diggings National Heritage Park. More information is provided on the springs in Section 2 *Quality Management*.

## 2. Quality Management



### **Water treatment**

#### **Tidal River & Twelve Apostles**

A strict regime of water treatment processes and monitoring continued at Tidal River and the Twelve Apostles during 2014 -15 as shown in the flow diagrams on pages 5-6.

There were no reportable non compliances for either location during the reporting period.

## Tidal River water supply

Parks Victoria continued to capture and treat raw water for consumption at Tidal River Campground.

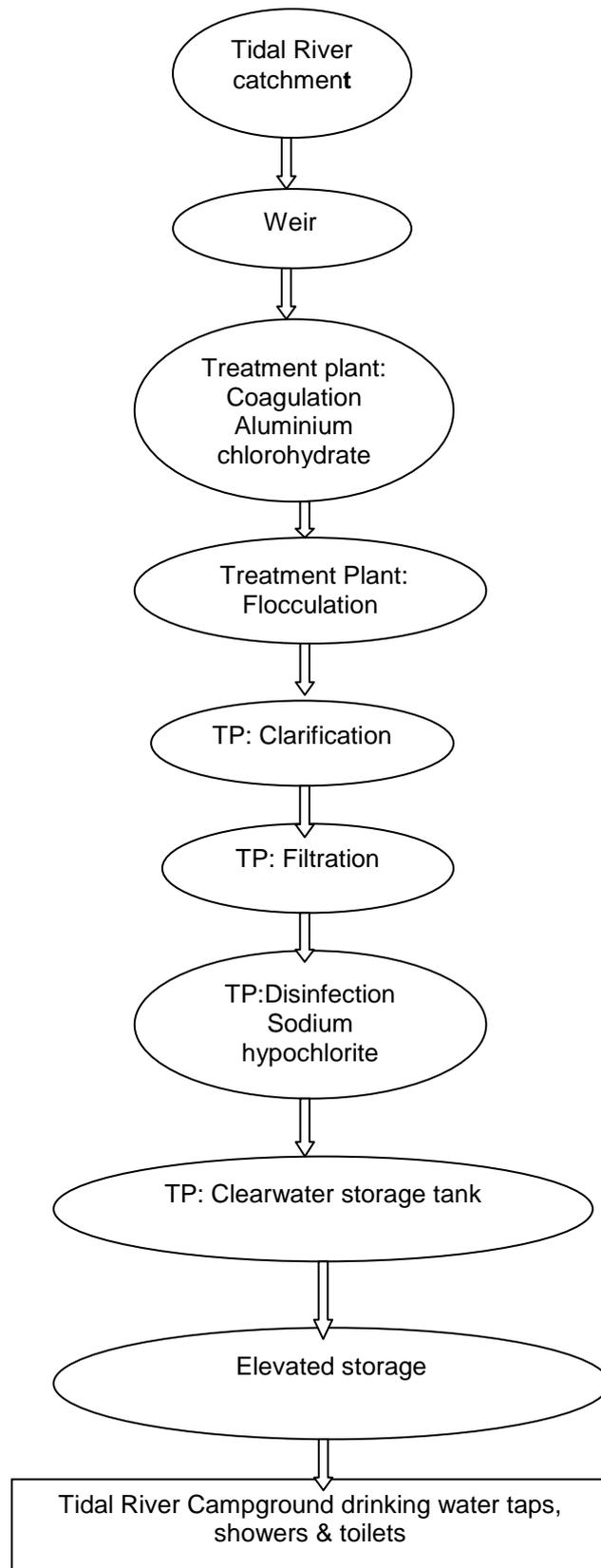
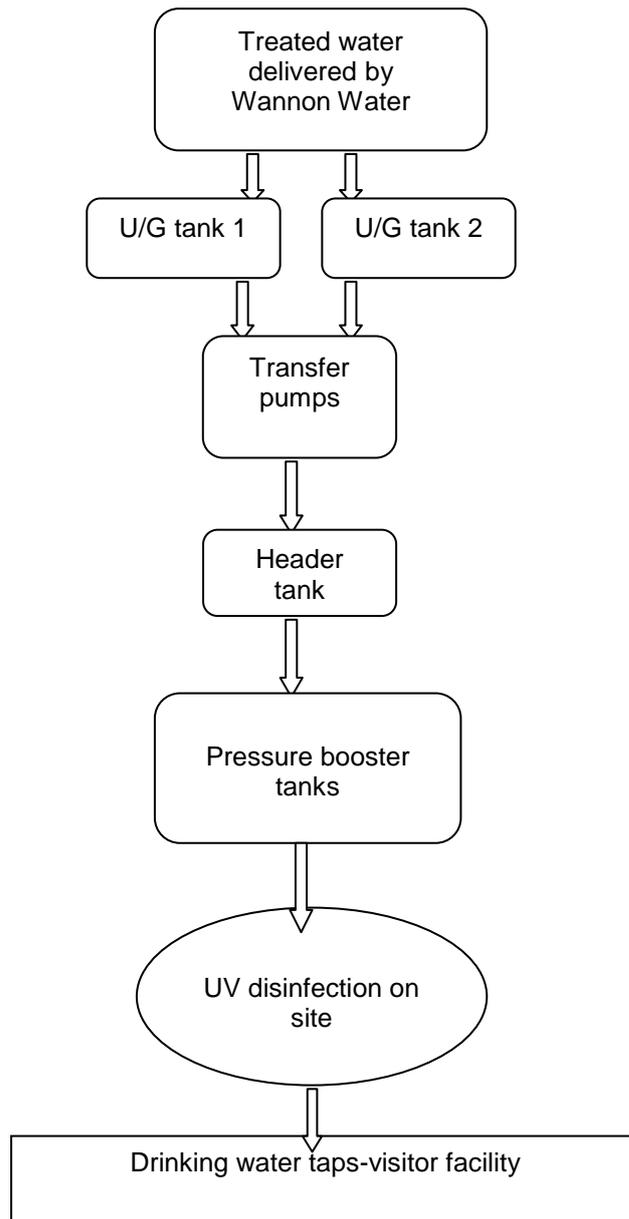


Figure 1: Tidal River safe drinking water flow diagram

## Twelve Apostles water supply

On 1 February 2015, Parks Victoria engaged Wannon Water to operate its WTP at the Twelve Apostles. The water supplied to the Parks Victoria facility comes from 6 of Wannon Water's 31 treatment plants.

To coagulate raw water, Wannon Water applies Aluminium sulphate and it disinfects the water prior to delivery with Sodium hypochlorite (Chlorine)



**Figure 2: Twelve Apostles safe drinking water flow diagram**

## Mineral Springs

At several mineral springs, facilities and infrastructure encourage visitors to drink spring water for the health benefits that it is believed to provide. Without affecting the viability of the tourism industry associated with the mineral springs, Parks Victoria recognises that appropriate risk management measures need to be applied to ensure that drinking the mineral water is as safe as possible. Given the absence of treatment, it is considered inappropriate to declare the springs as water sampling localities.

During the 2014-15 reporting period, several of the mineral springs recorded detections of *E. coli* (see Section 4 for more details).

*E.coli* is a bacterial species found naturally in the digestive tract of warm blooded animals. The presence of *E.coli* is an indicator that faecal contamination may have occurred. Parks Victoria took appropriate action in each case. This included signposting the affected spring(s) to the public. Signs remained in place until the next test sample and were removed only when water samples were free from *E. coli*.

Parks Victoria continues to test the mineral springs fortnightly for a broader range of water quality data. In conjunction with DHHS, this information will be used to guide future decisions related to managing the public health risk of the mineral springs.

Parks Victoria continues to report detections of *E. coli* at the springs under Section 22 of the SDWA, however, there is no treatment applied to the mineral spring water.

## Issues

### Tidal River & Twelve Apostles

In 2014 investigations by an industry consultant identified several issues with the Tidal River Water treatment plant (TRWTP) when operating at peak load, in particular chemical processes and plant design. A scope of works to address these issues has been developed and Expressions of Interest are currently out for specialist contractors to upgrade the treatment plant to meet the requirements of the 2015 Safe Drinking Water Regulations which will take effect from July 2015. The plant design upgrade will be fully completed by 30 June 2016. In the meantime, the TRWTP operator continues to operate the plant at the lowest possible output during peak periods to mitigate elevated trihalomethane (THM) readings.

In early June 2015, Parks Victoria engaged an industry consultant to review its Risk Management Plans for Tidal River and the Twelve Apostles in anticipation of the forthcoming 2015 Regulations. The work has provided Parks Victoria with a set of recommendations to improve the Risk Management Plans and operational processes at both sites to ensure the organisation will be compliant with the new Regulations.

### 3. Water Quality



Water quality was assessed according to a number of parameters in the Safe Drinking Water Regulations 2005 which collectively determined the suitability of water for human consumption. The limits of these parameters are listed in Table 2.

**Table 2: Water quality parameters and standards**

| Parameter                                  | Water quality standard (Schedule 2 SDWR 2005)   |
|--|---|
| <i>Escherichia coli</i> ( <i>E. coli</i> ) | At least 98% of all samples collected in the 12-month period to contain zero <i>E. coli</i> per 100mL |
| Turbidity                                  | 95% Upper Confidence Limit (UCL) of the 12-month mean of samples must be $\leq 5$ NTU.                |
| Aluminium                                  | Must not exceed 0.2 mg/L  |
| Chloroacetic acid                          | Must not exceed 0.15 mg/L   |
| Dichloroacetic acid                        | Must not exceed 0.1 mg/L  |
| Trichloroacetic acid                       | Must not exceed 0.1 mg/L  |
| Trihalomethanes                            | Must not exceed 0.25 mg/L   |

#### Sampling frequencies and parameters.

Agreed sampling frequencies for the reporting period were undertaken as listed in Table 3.

**Table 3: Agreed sampling regimes for 2013-14**

| Water sampling locality  | Sampling frequency | Parameters for routine monitoring  |
|--|--------------------|--|
| Tidal River in<br>Wilson's Promontory National Park              | Weekly             | <i>E. coli</i><br>Turbidity  |
|  | Monthly            | Aluminium<br>Chloroacetic acid<br>Dichloroacetic acid<br>Trichloroacetic acid<br>Trihalomethanes |
| Twelve Apostles Visitor Centre in<br>Port Campbell National Park | Monthly            | <i>E. coli</i><br>Turbidity  |

#### Results

*E. coli* and turbidity testing is required for all drinking water supplies. However, testing for aluminium and chlorine-based disinfection by-product chemicals is only required at water supplies where chemicals are added as part of the treatment process. Chemical treatment on site only occurs at Tidal River.

#### *Escherichia coli* (*E. coli*)

Testing for the presence of *Escherichia coli* (*E. coli*) was completed at both sites. The results of the tests are listed in Table 4.

**Table 4: Summary of *E. coli* test results**

| Water sampling locality   | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (orgs/100mL) | % Samples with no <i>E. coli</i> | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|----------------------|----------------------------------|--------------------|
| Tidal River -<br>Wilson's Promontory National Park              | Weekly             | 52             | 0                            | 0                    | 100%                             | Yes                |
| Twelve Apostles Visitor Centre -<br>Port Campbell National Park | Monthly            | 12             | 0                            | 0                    | 100%                             | Yes                |

At least 98% of all samples collected in the 12-month period must contain zero *E. coli*/100mL to comply.

### **Turbidity**

Testing for turbidity is required for all water supplies. The turbidity results of samples taken in 2014-15 are listed in Table 5.

**Table 5: Summary of turbidity test results**

| Water sampling locality                               | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (NTU) | Minimum (NTU) | 95% UCL of mean | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|---------------|---------------|-----------------|--------------------|
| Tidal River<br>Wilson's Promontory National Park      | Weekly             | 52             | 0                            | 0.6           | 0.2           | 0.62            | Yes                |
| Twelve Apostles Centre<br>Port Campbell National Park | Monthly            | 12             | 0                            | 3.0           | 0.1           | 0.88            | Yes                |

The 95% UCL result for mean turbidity must be  $\leq 5$  NTU for the locality to comply.

### **Aluminium**

Aluminium may be present in water through natural leaching from soil and rock, or from the use of aluminium salts as coagulants in water treatment. Aluminium is used by Parks Victoria at Tidal River as a raw water treatment coagulant. Testing for aluminium therefore occurs at this location only. The results of the tests for aluminium at Tidal River are provided in Table 6.

**Table 6: Summary of Aluminium test results**

| Water sampling locality                          | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (mg/L) | Minimum (mg/L) | Complying (Yes/No) |
|--|--------------------|----------------|------------------------------|----------------|----------------|--------------------|
| Tidal River<br>Wilson's Promontory National Park | Monthly            | 12             | 0                            | 0.18           | 0.02           | Yes                |

If the maximum result for acid soluble aluminium is 0.2 mg/L or greater, then the locality is non-complying.

## Chlorine based disinfection by-product chemicals

The use of chlorine as a disinfectant for treatment of drinking water is used at Tidal River. Testing for chlorination by-product chemicals therefore occurs only at this location. By-products of chlorine include chloroacetic acid, dichloroacetic acid, trichloroacetic acid and trihalomethanes. A summary of the results for chlorine by-products is provided in Tables 7 to 10.

**Table 7. Results of testing for Chloroacetic acid at Tidal River.**

| Water sampling locality                         | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (mg/L) | Minimum (mg/L) | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|----------------|----------------|--------------------|
| Tidal River<br>Wilsons Promontory National Park | Monthly            | 12             | 0                            | 0.010          | 0.010          | Yes                |

If the maximum result is 0.15 mg/L or greater, then the locality is non-complying.

**Table 8. Results of testing for Dichloroacetic acid at Tidal River.**

| Water sampling locality                         | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (mg/L) | Minimum (mg/L) | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|----------------|----------------|--------------------|
| Tidal River<br>Wilsons Promontory National Park | Monthly            | 12             | 0                            | 0.025          | 0.005          | Yes                |

If the maximum result is 0.1 mg/L or greater, then the locality is non-complying.

**Table 9. Results of testing for Trichloroacetic acid at Tidal River.**

| Water sampling locality                         | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (mg/L) | Minimum (mg/L) | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|----------------|----------------|--------------------|
| Tidal River<br>Wilsons Promontory National Park | Monthly            | 12             | 0                            | 0.025          | 0.005          | Yes                |

If the maximum result is 0.1 mg/L or greater, then the locality is non-complying.

**Table 10. Results of testing for Trihalomethanes at Tidal River.**

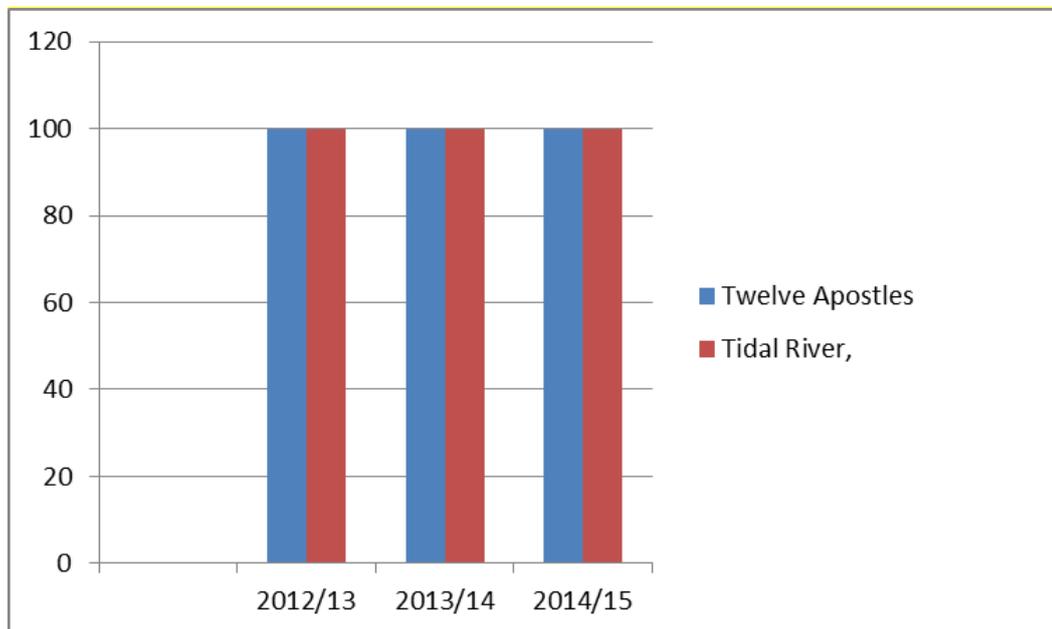
| Water sampling locality                         | Sampling Frequency | No. of samples | No. of Non complying samples | Maximum (mg/L) | Minimum (mg/L) | Complying (Yes/No) |
|---|--------------------|----------------|------------------------------|----------------|----------------|--------------------|
| Tidal River<br>Wilsons Promontory National Park | Monthly            | 12             | 0                            | 0.210          | 0.027          | Yes                |

If the maximum result is 0.25 mg/L or greater, then the locality is non-complying.

## Analysis of results

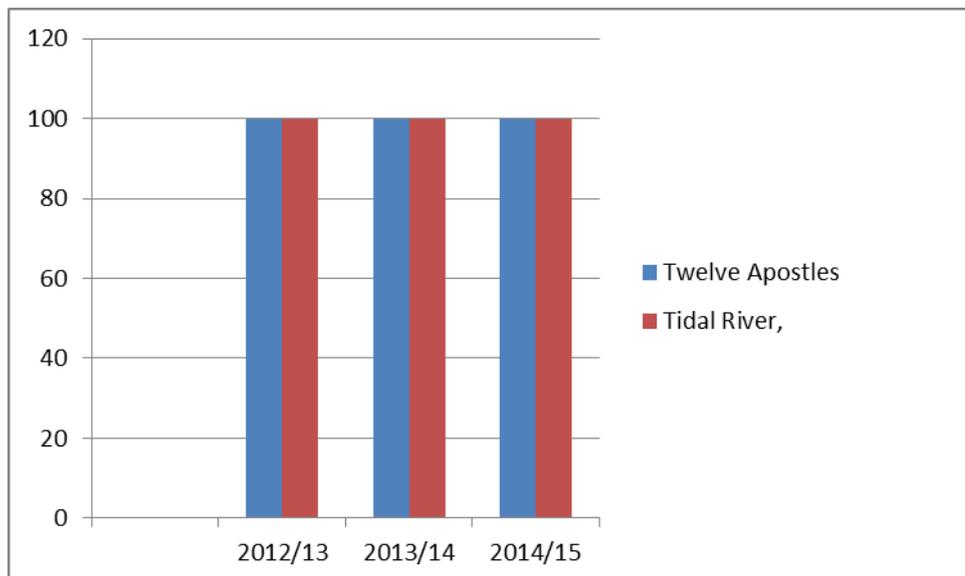
Graphs 1, 2 and 3 below compare water quality results from the last three financial years

Graph 1 below compares *E.coli* compliance at both sampling sites for the past three years. A 100% *E.coli* compliance was recorded at both sites for the three periods.



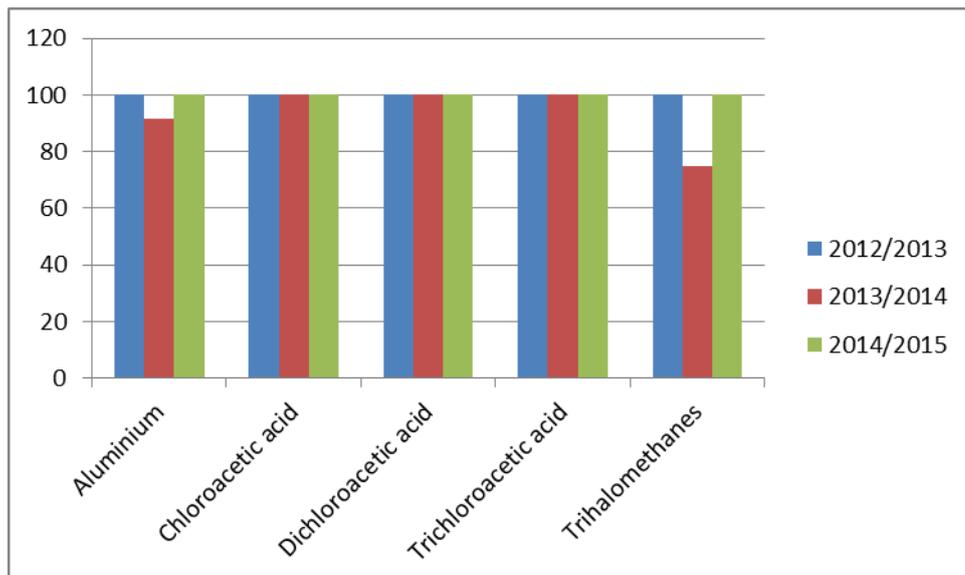
**Graph 1: *E. coli* compliance over 3 years at both locations**

Graph 2 below compares the turbidity results at all sampling sites for the past three years and shows a continuous level of compliance at both locations over 3 reporting periods.



**Graph 2: Turbidity compliance over 3 years at both locations**

Graph 3 below compares Tidal River's water quality results for chemicals for the 2014-15 period with the previous two financial years. Chemical standards were compliant in the 2014-15 period. There was also an improved level of compliance for THM.



Graph 3: Chemical standards for the past 3 years at Tidal River, Wilsons Promontory NP

## 4. Incident Management



### Incidents requiring Section 22 Reports

Section 22 reports were submitted as described in Table 11, when test results from mineral springs in the Hepburn Regional Park recorded detections of *E. coli*. The water from each spring comes from a natural source and heavy rainfall may recharge the springs leading to cross contamination between shallow run off and mineral water as it moves to the surface through the shallow fractured rock. Regular testing for *E.coli* is undertaken to monitor for microbial contamination that may be harmful to health. When test results identified the presence of *E.coli*, Parks Victoria took appropriate action including notifying DHHS and installing “Do Not Drink” signs (See Figure 3). The springs were re-opened only when *E. coli* levels returned to zero.

Figure 3: Example Warning/Information Signage

#### Mineral Spring Temporarily Closed

This mineral spring is routinely tested to ensure it is safe for visitors monitoring has shown that rainwater run-off has mixed with this mineral spring water causing temporary contamination.



**DO NOT DRINK**

Mineral spring water can still be sourced from other springs in the area including Hepburn Mineral Springs.



For further information on mineral springs and attractions in the area contact the Daylesford Visitor Information Centre on 5321 6123

**Table 11: Summary of Section 22 incidents at Mineral Springs**

| Water sampling locality             | Incident  | Date of incident |
|-------------------------------------|---|------------------|
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (1 MPN/100ml)   | 2/7/2014         |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (5 MPN/100ml)   | 16/7/14          |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (5 MPN/100m)    | 30/7/14          |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (2 MPN/100ml)   | 13/8/14          |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (2 MPN/100ml)   | 19/11/14         |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (170 MPN/100ml) | 14/1/15          |
| Mineral Spring – Deep Creek         | <i>E. coli</i> recorded in water sample ( 1MPN/100ml)   | 28/1/15          |
| Mineral Spring – Sailors Falls Pipe | <i>E. coli</i> recorded in water sample (3MPN/100ml)    | 6/5/15           |
| Mineral Spring –Deep Creek          | <i>E. coli</i> recorded in water sample (1 MPN/100ml)   | 21/5/15          |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (45 orgs/100mL) | 21/5/15          |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (1 MPN/100ml)   | 3/6/15           |
| Mineral Spring – Tipperary Pipe Pit | <i>E. coli</i> recorded in water sample (4 MPN/100ml)   | 17/6/15          |
| Mineral Spring – Henderson          | <i>E. coli</i> recorded in water sample (1 MPN100ml)    | 17/6/15          |

### Other incidents

There were no other incidents in the 2014-15 reporting period.

## 5. Complaints



No complaints about water quality were received regarding any of the water sampling localities listed by Parks Victoria.

## 6. Audit Findings



In the 2014-15 reporting period, Parks Victoria engaged a water industry consultant to review its Risk Management Plans for Tidal River and the Twelve Apostles. This was undertaken to address and rectify all outstanding actions from the 2013-14 external audit and to prepare for the introduction of the new Safe Drinking Water Regulations.

No audits were undertaken in this reporting period.

## 7. Undertakings under Section 30



No agreed undertakings with DHHS were required under section 30 for any of the water sampling localities

## 8. Regulated Water



Section 6 of the SDWA allows the Minister for Health to declare water that is not intended for drinking, but which could be mistaken for drinking water, as regulated water. The Parks Victoria's estate has several hundred water supplies that are not intended for drinking. Parks Victoria decided that these supplies should remain accessible to park visitors, however, all are signed as "Not for Drinking" to ensure visitors cannot mistake the water at these sites for drinking water.

The signs describe the water supply as *untreated rainwater*, *untreated bore water*, *untreated creek water*, or *untreated water*. These descriptions are intended to assist visitors in selecting the most appropriate method of treatment should they choose to use the water.

At this stage, DHHS has not considered it necessary to declare the water supplied at these sites as regulated water as the signage should remove any confusion as to whether the water is intended for drinking.

Parks Victoria produces information sheets (Park Notes) to provide park users with information relevant to the visitor site or park they are visiting. As existing Park Notes are updated and reprinted, any wording or symbols that suggest drinking water is available at sites other than the gazetted drinking water sampling localities and those visitor sites with reticulated drinking water are being removed. This also applies to drinking water messaging that appears on the Parks Victoria website and other promotional publications.

In partnership with DHHS, a specific Park Note was issued to provide advice on the risks of untreated water. This Park Note advises on treatment methods and necessary precautions and is available on the Better Health Channel website, Parks Victoria website [www.parkweb.vic.gov.au](http://www.parkweb.vic.gov.au) and Parks Victoria visitor centres.

## 9. Glossary of Terms



### **95% UCL**

95% upper confidence limit of the mean of samples of drinking water collected in any 12 month period.

### **Drinking Water**

Defined as water intended for human consumption or for purposes connected with human consumption such as food preparation. It is also known as potable water.

**Localities**

An area supplied by drinking water of similar water quality and able to be described by its boundaries

**NTU**

Nephelometric turbidity units - a unit of measurement for turbidity.

**Regulated water**

Water which is not intended for drinking, but which could reasonably be mistaken as being drinking water. It is water that is the subject of a declaration made by the Minister under section 6 of the Safe Drinking Water Act

**Risk Management Plan**

A document that contains a detailed description of the system of supply, identification and assessment of the risks to the quality of the water and the steps being taken to manage those risks.

**SDWA 2003**

*Safe Drinking Water Act 2003*

**Section 30 undertaking**

The agreement between a water supplier and DHHS that details how the water supplier, when in contravention of the SDWA or its associated regulations, will address the contravention and stop it from recurring.

**Section 22 notification**

The type of notification required by DHHS, as set out in section 22 of the SDWA, when drinking water supplied to the public may pose a risk to human health or cause widespread public complaint.

**Zone**

A specific area in a national park or reserve defined by a primary purpose and value.