

14. Surface water quality

This chapter summarises information from a Surface Water Quality Assessment undertaken for the Project. A copy of the full assessment report is provided in Appendix H.

14.1 Methodology

This chapter summarises the outcomes of a surface water quality impact assessment that was undertaken in support of the overall Environmental Assessment. The approach was to:

- ▶ Assess the potential impacts of the construction and operation of the Project on the surface water quality generally in the vicinity of the Project. This involved identifying the water resources that would be impacted, the water quality of those resources, and how they are used;
- ▶ Demonstrate specifically how the Project would be designed and managed to achieve a neutral or beneficial effect on water quality in the Sydney drinking water catchment consistent with the intention of the NSW *Drinking Water Catchments Regional Environmental Plan No. 1*. In doing so, specific reference was made to Sydney Catchment Authority's (2006) *Neutral or Beneficial Effect on Water Quality Guidelines*; and
- ▶ Identify and describe monitoring and actions that would be required to manage or mitigate the risks associated with those hydrology and surface water impacts. These were developed based on a consideration of the risk associated with the potential impacts on water quality (*i.e.* by conducting a risk assessment).

14.2 Existing Environment

14.2.1 System boundaries

This assessment considered surface waterways and water resources that would:

- ▶ Have infrastructure constructed within the natural flow area of the resource;
- ▶ Have new infrastructure constructed within its current catchment area; or
- ▶ Be diverted (temporarily or permanently) to cater for the project;

14.2.2 Potentially impacted water resources

Catchments and water resource values

The pipeline would be constructed entirely within the SCA's drinking water catchments. The pipeline corridor runs north of, and roughly parallel to, the catchment boundary separating the Hawkesbury-Nepean River catchment from the Southern Rivers catchment.

The site mainly falls within the area managed by the HNCMA. The pipeline follows an upward sloping gradient from an altitude of approximately 675 m at Moss Vale to 702 m above sea level at Goulburn. The pipeline route is mostly gently undulating in topography, crossing creeks, rivers and other infrastructure. The area through which the proposed pipeline would traverse generally drains north, with the eastern section of the pipeline route draining naturally into the Wingecarribee River, and the western

section of the pipeline route draining into the Wollondilly River. These two rivers form a confluence within the Wollondilly Nature Reserve.

The surface water resources in these catchments support a variety of activities and values, including drinking water supply, agriculture, and recreational/aesthetic values.

Watercourses

Table 14.1 contains a listing of the major water crossings and how it is proposed that they would be crossed during the construction of the pipeline. The proposed construction methods were based on an assessment of the waterway, the flow conditions, geomorphology and other conditions (Appendix I) in accordance with guidance provided by the NSW Office of Water (DWE, 2008a; 2008b).

Table 14.1 Water crossings and proposed crossing methods

| Crossing Reference | Name | Proposed construction method |
|---------------------------|---------------------|-------------------------------------|
| W3 | Kelly's Creek | Horizontal Directional Drilling |
| W14 | Medway Rivulet | Trenched |
| W19 | Wells Creek | Trenched |
| W22 | Black Bob's Creek | Trenched |
| W27 | Long Swamp Creek | Trenched |
| W52 | Paddys River | Horizontal Directional Drilling |
| W56 | Uringalla Creek | Horizontal Directional Drilling |
| W69 | Jaormin Creek | Horizontal Directional Drilling |
| W81 | Lockyersleigh Creek | Trenched |
| W84 | Narambulla Creek* | Horizontal Directional Drilling |
| W95 | Osborns Creek | Trenched |
| W105 | Wollondilly River | Horizontal Directional Drilling |
| W106 | Wollondilly River | Horizontal Directional Drilling |
| W108 | Boxer's Creek | Trenched |
| W119 | Wollondilly River | Horizontal Directional Drilling |
| W120 | Kenmore Creek | Horizontal Directional Drilling |
| W122 | Kenmore Creek | Trenched |
| W123 | Kenmore Creek | Trenched |
| W124 | Kenmore Creek | Trenched |

| Crossing Reference | Name | Proposed construction method |
|--------------------|-------------------|---------------------------------|
| W131 | Wollondilly River | Horizontal Directional Drilling |

* Seasonal flooding / waterlogging on a floodplain associated with Narambulla Creek is mapped just north of the proposed alignment. This feature may warrant consideration for alternative site access or crossing construction techniques (e.g. horizontal direction drilling).

Wetlands

A search of the Protected Matters database search tool that is maintained by the DEWHA⁵ did not identify any protected wetlands within the vicinity of the construction impact zone of the proposed pipeline.

14.2.3 Flooding

The estimated Project construction timeframe is 12 months. The likelihood of a flood event occurring over the timeframe of the construction phase is demonstrated in Table 14.2 in accordance with the procedures of the *Australian Rainfall and Runoff* (Institution of Engineers Australia, 2001).

Table 14.2 Likelihood of flood occurrence during construction phase

| Construction timeframe | Probability of occurrence for flood event of given Average Recurrence Interval (ARI) | | |
|------------------------|--|-------------|--------------|
| | 5-Year ARI | 20-Year ARI | 100-Year ARI |
| 1 Year | 18% | 5% | 1% |

14.2.4 Water quality

Water quality of the water in the proposed pipeline

The quality of the water that would be transferred via the proposed pipeline is of interest because it may need to be released from the pipeline during certain management activities, such as pipeline scouring (this is discussed in more detail in the impact assessment at Section 14.3).

The quality of the water that would typically be sourced from the Wingecarribee Reservoir and so, under the raw water transfer scenario, would nominally be in the pipeline is described in Table 14.3. It is noted that water from Wingecarribee Reservoir is also released into the Wingecarribee River for environmental flows.

Table 14.3 Water quality in the proposed pipeline (raw water transfer scenario)*

| Parameter | Observation |
|---------------|---|
| Turbidity | Typically < 10 NTU; always < 15 NTU |
| <i>E.coli</i> | Often > 10 / 100 mL and spike up to 16 000 / 100 mL |
| Manganese | 0.025 - 0.062 mg/L |

⁵ <http://www.environment.gov.au/erin/ert/epbc/index.html>

| Parameter | Observation |
|--|---|
| True colour | Typically 30 - 60 Hu |
| pH | 6.9 – 9.8 |
| Alkalinity | 15 - 20 mg/L as calcium carbonate CaCO ₃ |
| Hardness | 20 - 25 mg/L as calcium carbonate CaCO ₃ |
| Dissolved Organic Carbon | 5 mg/L |
| Cyanobacterial counts | Total cyanobacterial counts up to 622 000 cells/mL; median ca. 100 000 cells/mL. Toxic species – higher levels in summer, overall median < 2000 cells/mL |
| Total Dissolved Solids | Approx. 50 mg/L at surface; 160 mg/L at depth of 10 - 15 m |
| *Based on water quality data from the Wingecarribee Reservoir courtesy of Sydney Catchment Authority and Wingecarribee Shire Council | |

The physico-chemical properties of the raw water in Wingecarribee Reservoir are generally within the water quality guideline values provided in the *Fresh and Marine Water Quality Guidelines* (ANZECC, 2000) for the maintenance of aquatic systems and for the use of the water for crop irrigation or livestock watering. The exception is that *E. coli* and cyanobacteria (blue-green algae) levels can fluctuate to beyond the ANZECC (2000) and other guidance for these parameters (see Figure 14.1 and Figure 14.2), and some consideration or management of these would likely be required in the event that the pipeline would need to be drained or scoured (Table 14.4).

If the treated water transfer scheme is constructed then the quality of the water being released during, say, scouring activities would be of a quality suitable for drinking by humans, and would contain less contaminant than what is typically found in environmental waters. The Wingecarribee WTP has a history of providing water adequate for human consumption, even when challenged, for example, by blue-green algae bloom events in its feed water (e.g. DECC, 2008a). Hence, the water would be appropriate for stock and domestic uses, for example, in accordance with the guidance in Chapter 4 of ANZECC (2000) water quality guidelines. Therefore, the release of this water would not likely cause significant impact to receivers such as sheep, cattle or horses. The most pertinent issue would be that the scour water would contain a chlorine residual following chlorination at the Wingecarribee WTP and boosters along the pipeline. The target chlorine residual levels of the piped water would be in the order of 0.02 mg/L at the point of entry to the Goulburn reticulation system in accordance with the guidance set out in the *Australian Drinking Water Guidelines* (NHMRC, 2004), to provide some protection of the supply against microbial contamination (Appendix D). This level of chlorine is greater than the ANZECC (2000) guideline (0.003 mg/L) for the protection of aquatic systems in waterways. The management of this is discussed further in Section 14.4.3.

Table 14.4 Water quality considerations when draining/scouring the proposed pipeline

| Parameter | Observation in Wingecarribee Reservoir water | ANZECC (2000) guidance on water quality requirements for certain purposes | Other comments |
|----------------|--|--|--|
| <i>E. coli</i> | Often < 10 / 100 mL though isolated | <i>The following guidance refers to Total Coliforms, an alternative microbial quality indicator, as E. coli was not directly</i> | <i>E. coli</i> is a type of coliform, and so the levels of coliforms observed in the |

| Parameter | Observation in Wingecarribee Reservoir water | ANZECC (2000) guidance on water quality requirements for certain purposes | Other comments |
|------------------------------|--|--|--|
| | <p>spikes up to 16 000 / 100 mL have been observed</p> | <p><i>addressed in the guidelines.</i></p> <p>Raw human food crops in direct contact with irrigation water (e.g. via sprays, irrigation of salad vegetables): <10 cfu / 100 mL</p> <p>Raw human food crops not in direct contact with irrigation water (edible product separated from contact with water, e.g. by peel, use of trickle irrigation); or crops sold to consumers cooked or processed <1000 cfu / 100 mL</p> <p>Pasture and fodder for dairy animals (without withholding period) <100 cfu / 100 mL</p> <p>Pasture and fodder for dairy animals (with withholding period of 5 days) <1000 cfu / 100 mL</p> | <p>Wingecarribee Reservoir are usually well below the guidance provided by ANZECC (2000) for Total Coliforms.</p> |
| <p>Cyanobacterial counts</p> | <p>Total cyanobacterial counts up to 622 000 cells/mL; median ca. 100 000 cells/mL</p> | <p>Livestock</p> <p>“An increasing risk to livestock health is likely when cell counts of Microcystis [as opposed to total cell counts reported to the left] exceed 11 500 cells/mL and/or concentrations of microcystins exceed 2.3 µg/L expressed as microcystin-LR toxicity equivalents. There are insufficient data available to derive trigger values for other species of cyanobacteria.”</p> <p>Irrigation</p> <p>“Cyanobacteria (blue-green algae) form part of the natural microbial population in most waterbodies. Under certain natural or human-induced circumstances, toxic blooms can occur and these may adversely affect the suitability of waters for irrigation. If an algal bloom occurs, it is recommended that an alternative source of irrigation water be used, and that the water be tested for microbial composition and (if necessary) toxicity. There is presently insufficient information available for use in deriving trigger values for cyanobacteria in irrigation water.”</p> | <p>Cyanobacteria is a naturally occurring contaminant in water bodies.</p> <p>Water Directorate (2009) have more recently advised that concentrations of microcystins exceeding 1.2 µg/L expressed as microcystin-LR toxicity equivalents may be hazardous to cattle over the longer term.</p> <p>There has also been a move toward considering other toxic cyanobacteria (e.g. saxitoxins) when considering appropriate uses for water.</p> |

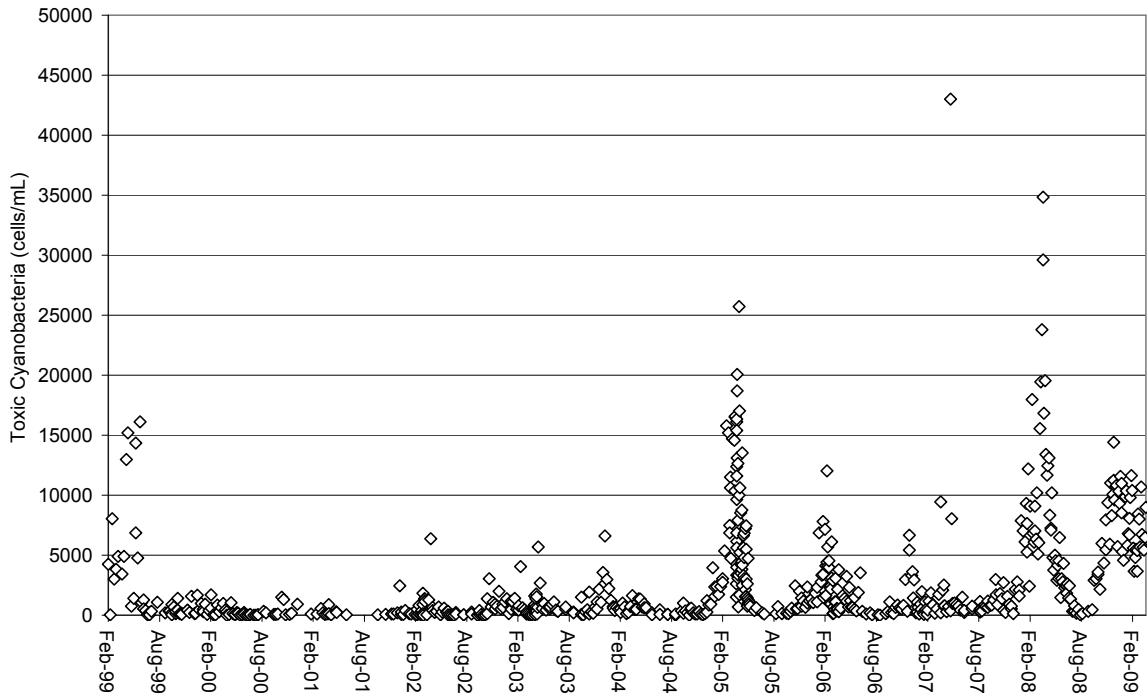


Figure 14.1 Toxic cyanobacteria (all species) counts in Wingecarribee Reservoir

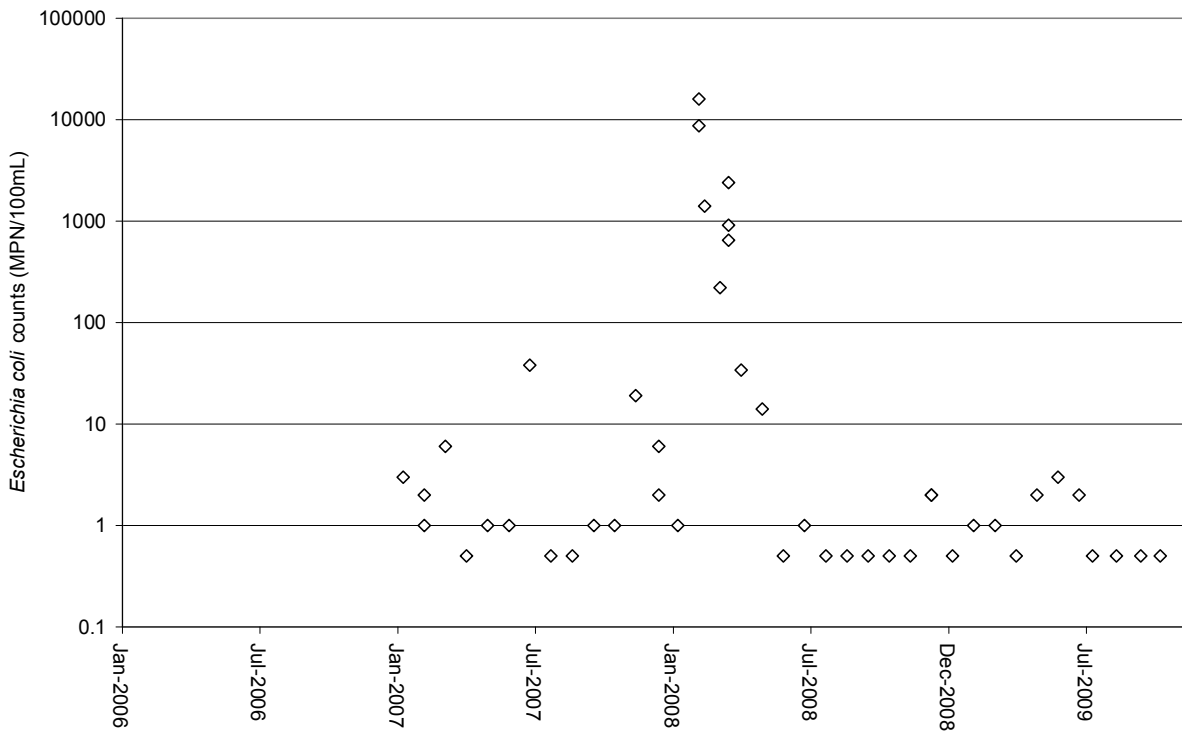


Figure 14.2 E.coli counts in Wingecarribee Reservoir

Surface waterways in Sydney drinking-water catchment

Two documents provide a comprehensive overview of the water quality and the health of the Sydney drinking water catchments:

- ▶ *Sydney Catchment Authority Annual Water Quality Monitoring Report 2007-08* (SCA, 2009); and
- ▶ *2007 Audit of the Sydney Drinking Water Catchment* (DECC, 2008a).

In summary, some of the waterways in the vicinity of the Project, such as the Wollondilly River, have had a recent history of exceeding water quality guidelines adopted by the SCA particularly for chlorophyll-a, nutrient levels and dissolved oxygen levels; this indicates that there can be a relatively high blue-green algae bloom potential in these waters. An imperative point of the management of the Project would be that it is done in a manner so as not to exacerbate (and ideally improve) any water quality issues that exists in the Sydney drinking-water catchment.

Groundwater discharge

During the construction phase it is possible that groundwater will infiltrate the trench. This groundwater will need to be pumped from the trench. The groundwater will be pumped to a tank and tested prior to discharge to a farm dam. The water would be tested to ensure it meets the ANZECC Guidelines for water quality appropriate to this purpose, *i.e.* water for stock use or irrigation. It is generally anticipated that the groundwater quality will be good (refer Chapter 14).

14.2.5 Geology and soils

The nature of the geology and soils in the vicinity of the pipeline is of interest as these, when disturbed and/or stockpiled, would be a primary source of potential contamination of waterways unless appropriate management strategies were in place. The nature and the management of soils and waste produced in association with the Project are described in detail in Chapter 25. In summary:

- ▶ There is a sheet erosion hazard associated with the soils along the majority of the proposed pipeline corridor, that would require management during the construction phase;
- ▶ There is low potential for acid sulfate soils or significantly contaminated soils to be disturbed during the excavation and construction process; and
- ▶ At water crossing points, sedimentary rock or alluvial deposits (which are likely to be underlain by sedimentary rock) are the predominant structures. Igneous rock (most likely underlain by minor alluvial deposits at the watercourse crossing locations) is expected to underlie the crossing at Jaormin Creek (WAT 8), Lockyersleigh Creek (WAT 9), Narambulla Creek (WAT 10) and the Wollondilly River (WAT 20). Of these crossing points underlain by igneous rock, it is proposed to horizontal direction drill the crossing of the Wollondilly River (WAT 20).

14.3 Impact Assessment

14.3.1 Impact identification (overview)

Broadly, surface water quality may be impacted in the following manners.

Construction activities and associated increases in heavy vehicle traffic may lead to an impact on water quality in various waterways through the generation of sediment-laden overland run-off, spillage of oils (*e.g.* machinery fuels or maintenance), litter (*e.g.* from the construction workers and activities) and

alkaline cement materials. Should they enter the waterways, these pollutants have the potential to impact on water quality by increasing turbidity and suspended particle levels, altering pH (e.g. due to alkaline cement material) or increasing hydrocarbon levels in the water. If inadequately controlled, changes to water quality could impact on the aquatic ecology of the river and any downstream water users.

Potential construction impacts can be managed by the implementation of standard construction environmental management measures that would be described throughout a dedicated CEMP. Provided these measures are implemented, the potential for impacts on water quality is considered to be low.

The potential impacts during the *operational phase* would be associated with the potential for pollution of the waterways from or during maintenance activities (including during access to the pipeline by workers, scouring or the release of water from the pipeline for various reasons *etc.*). These activities would require some management or standard operating protocols to limit the risk of waterway contamination (refer Table 14.4).

14.3.2 Risk assessment

The Project provides an opportunity to have some beneficial impacts on the surface water quality within the Sydney drinking water catchments, for example by revegetation and by offsetting land clearing, as described in the ecological assessment report undertaken for this Project (Appendix E). However, the Project would have impacts on and introduce new risks to the overall surface water quality that would require careful management. A detailed assessment of the identified impacts (listed above) was undertaken by considering the risks that would be associated with the impacts.

A risk assessment was conducted to:

5. Prioritise the identified impacts in terms of the potential relative risk each may pose to the surface water quality and the consequences that may arise from any changes; and
6. Identify targeted actions and initiatives that would need to be adopted to monitor and manage the risks during the proposed Project operations.

Broadly, the greatest risks to waterway contamination occurs during the construction phase and is associated with excavation activities and stock piling of material by introducing a pathway for mobilized sediment to enter the waterways at localized points. The standard set of project controls described in Chapter 6 would generally provide adequate control against the greater majority of these risks to surface water quality, and ensure a neutral effect on water quality in the Sydney drinking water catchment. They also comply with the recommended work practices that have been endorsed by the SCA⁶. However, some additional specific measures would be beneficial, as described in Section 14.4.

14.3.3 Neutral or Beneficial Effect on Water Quality

The SCA (2006) has developed a guidance manual to assist proponents of projects to assess whether the proposal would have a neutral or beneficial effect on water quality in the Sydney catchments. Broadly, the effect can be considered neutral if (SCA, 2006:10):

⁶ <http://www.sca.nsw.gov.au/the-catchments/regional-plan/regional-plan-current-recommended-practices> accessed at 10 January 2010.

- “a) pollutant loads that occur as a result of the development / activity can be transported to acceptable downstream treatment and disposal facilities without adverse off-site water quality impacts, and/or
- b) any water quality issues can be effectively managed on-site such that there are no adverse water quality impacts occurring off-site, and
- c) there are no adverse water quality impacts that arise or are likely to arise indirectly as a result of changes to factors that affect the treatment, assimilation of pollutants, or affect the quality of water as part of the hydrological cycle (such as changes to flow or flow paths, water courses or riparian corridors) that can adversely affect water quality off the site.”

In terms of water quality, it is considered that the project would have a neutral effect on the quality of water discharging to the receiving environment. Specifically:

- ▶ The construction phase is reasonably short at less than 12 months duration, and all construction phase impacts would be managed in accordance with the measures outlined in Chapter 6. While a large portion of the project is not located in the vicinity of drainage lines, in areas where drainage lines are in close proximity, construction techniques can be used to minimise disturbance to creeks. For larger waterways, crossing methods such as thrust boring and HDD could be adopted;
- ▶ The pipeline would be buried throughout the route. The land within the pipeline easement would be rehabilitated post construction, and therefore little opportunity would exist for long-term water quality impacts, and rehabilitation and land clearing offset requirements for this Project offers the opportunity to improve long-term catchment health in some places;
- ▶ There would be negligible alterations to the erosion potential at the nominated water crossings (Appendix I);
- ▶ Pipeline scour water would not be released directly to waterways (see Section 14.4.3). For the raw water transfer option, and in the event that the water quality is considered unsuitable for release to nominated farm dams, then on-site treatment or tankering and suitable disposal would need to be arranged. The volumes released would be relatively small for each valve operation exercise and would be manageable with tankering to a nearby farm dam where it could be treated if required on-site depending on the specific water quality issue. More on the management of scour water, and the role that could be played by DECCW and/or the SCA, is provided at Section 14.4.3.

14.4 Mitigation measures

14.4.1 Construction phase

All construction activities would be supported by a CEMP for the works. This plan would address water quality management, and would incorporate those things described in Chapter 6 such as:

- ▶ Allocation of general site practices and responsibilities;
- ▶ Material management practices;
- ▶ Stockpile practices;
- ▶ Topsoil practices;
- ▶ Surface water and erosion control practices (earth sediment basins, straw bales, sediment fences, turbidity barriers, stabilised site accesses, diversions and catch drains); and

- ▶ Rehabilitation plans, particularly for major waterway crossings.

Generally, appropriate measures would be provided to prevent the entry of soils or In addition, the following would provide additional protection against waterway contamination:

- ▶ Placing plant and site equipment outside the 1 in 20 year average reoccurrence interval (ARI) flood affected area whenever possible, and storing plant and machinery that is not in use outside of flood affected areas;
- ▶ Placing spoil outside flood affected areas and disposed of in accordance with relevant guidelines and legislation;
- ▶ Undertaking construction during dry seasons as much as it is possible as this would minimise the potential for rain/flood events to wash contaminants from the construction sites into local waterways;
- ▶ Visual monitoring would be undertaken to ensure that stormwater management measures are working effectively. Visual inspections should be undertaken at creeks and areas where infrastructure has been provided as part of the project, for example the pump station, access roads, and locations of scour facilities. The visual inspections would assess whether there were large amounts of debris, spills, runoff, etc. entering any waterways, and would also assess that systems and barriers to prevent contamination were in place and operating. A general indication of frequencies for inspections is provided in Table 14.5. An inspection log detailing the monitoring program should be kept.

Table 14.5 Visual inspection monitoring program

| Sample location | Collection mechanism | Frequency first six months | Frequency normal operation |
|--|--|----------------------------|---------------------------------|
| Sediment Basins | Visual Inspection | Every runoff event | First runoff event of any month |
| Drainage and diversion channels | Visual Inspection | Every runoff event | First runoff event of any month |
| Overland flow paths | Visual Inspection | Every runoff event | First runoff event of any month |
| Trafficable areas | Visual Inspection | Every month | |
| Bunded areas | Visual Inspection | Every runoff event | |
| Other works areas, potentially contaminating stormwater such as at scour locations | Visual Inspection and system operation testing | Every month | |

14.4.2 Operational phase - general

As the construction impact zone would be rehabilitated and offsets would be provided for cleared vegetation (as outlined in the ecological assessment report, Appendix E), there would not likely be long-term consequences to catchment or surface water quality as a result of the project, provided the standard construction management practices are followed. In general, the following would facilitate the management of operational phase water quality impacts:

- ▶ Development of a standard operating procedure for access to the pipe during maintenance activities, chemical/fuel storage, and for pipe flushing that meets statutory requirements;
- ▶ Ensuring that revegetation of rehabilitated areas is undertaken in accordance with a Vegetation Management Plan that provides for vegetation which protects against erosion. In certain areas additional armouring of embankments may be required using environmentally sensitive strategies such as rock; and
- ▶ Developing a protocol for the management of drainage/scour water from the pipeline.

The third point is discussed further below.

14.4.3 Operational phase - handling of scour water

The preferred approach to the management of scour water would be to utilise the water on the properties where scouring occurs. Typically this would involve pumping (via collapsible fabric pipes) the scour water to a nearby existing farm dam. Where no suitably located farm dam exists, a small dam could be constructed with the approval of the landholder. This is normally viewed as advantageous by landholders. No scour water would be directly released to watercourses.

The approach to managing the scour water would vary slightly depending on whether the treated water transfer scheme or the raw water transfer scheme is constructed.

Treated water transfer scheme

If the treated water transfer scheme is constructed then the water quality of the water being released during scouring would be of a quality suitable for drinking by humans, and would contain less contaminant than what is typically found in environmental waters. Therefore, the release of this water would not likely cause significant impact to receivers such as sheep, cattle or horses. Hence, the water would be appropriate for stock and domestic uses, in accordance with the guidance in Chapter 4 of ANZECC (2000) water quality guidelines.

The most pertinent issue would be that the scour water would contain a chlorine residual following chlorination at the Wingecarribee WTP and boosters along the pipeline. The target chlorine residual levels of the piped water would be in the order of 0.02 mg/L at the point of entry to the Goulburn reticulation system, to provide some protection of the supply against microbial contamination. This level of chlorine is greater than the ANZECC (2000) guideline (0.003 mg/L) for the protection of aquatic systems in waterways. However this would be managed in the following ways:

- ▶ Maintenance scheduling - the timing for scour activities would be agreed in advance. This would allow the pipeline to be isolated from the Goulburn water reticulation system and the Wingecarribee WTP, and the shut-down of booster chlorinators for some time period in advance of the scheduled scouring. This would allow the free chlorine residual in the pipeline to decay prior to the scouring.
- ▶ The chlorine would breakdown on exposure to sunlight once the water enters the dam.
- ▶ A standard practice procedure would be prepared in consultation with the SCA and DECCW to guide the management of scour water. As mentioned above, a component of this plan would be that the water would not be released into environmental waterways, and would be pumped into a receiving farm dam for appropriate (stock and domestic) uses agreed to by the landholder and other relevant bodies. The farm dam used would be of adequate size and the scour activities coordinated in a manner to prevent the risk of the dam spilling into any nearby waterways.

Raw water transfer scheme

A standard practice procedure would be prepared in consultation with the SCA and DECCW to guide the management of scour water. The procedure would form part of an OEMP for the pipeline. The procedure for managing scour water would typically involve the following:

- ▶ Maintenance scheduling - maintenance of pipeline sections and valves would be undertaken in winter when the likelihood of blue-green algae blooms in the Wingecarribee Reservoir are significantly lower. In the periods June-August the total cyanobacteria counts in the reservoir are typically observed at < 30 000 cells/mL, toxic species counts are < 1 000 cells/mL, and so it would be likely that toxic Microcystis counts would be <<< 11 500 cells/mL (though this would need to be confirmed);
- ▶ Assessing water prior to release from valve - the routine cyanobacteria and *E. coli* monitoring undertaken at the Wingecarribee Reservoir by SCA would be analysed to assess the likely water quality in the portion of pipeline that is being scoured. If the microbial water quality were considered to be undesirable for scouring and release to the farm dam, then management would involve either:
 1. Delaying the scour activity until such time that the monitoring suggests the risks of undesirable quality water being placed in the farm dam were sufficiently low (triggers would be agreed to by the receiving landowner and the SCA and DECCW); or
 2. Providing on-site treatment (filtration or disinfection) by use of a portable treatment plant prior to release of the water to the farm dam (appropriate treatment would be agreed to by the receiving landowner and the SCA and DECCW);
- ▶ Release of water into an onsite reservoir. As mentioned above, a component of this plan would be that the water would not be released into environmental waterways, and would be pumped into a receiving farm dam for appropriate (stock and domestic) uses agreed to by the landholder and other relevant bodies. The farm dam used would be of adequate size and the scour activities coordinated in a manner to prevent the risk of the dam spilling into any nearby waterways.