PROPOSED WEST CAMDEN SEWAGE TREATMENT PLANT UPGRADE AND AMPLIFICATION

Director General's Report
Section 115C of the
Environmental Planning and Assessment Act 1979

January 2004

Published January 2004
NSW Department of Infrastructure, Planning
and Natural Resources
www.dipnr.nsw.gov.au
ISBN 0 7347 5425 6

FOREWORD

Sydney Water Corporation (SWC) proposes to upgrade and amplify the existing West Camden Sewage Treatment Plant (STP) and construct an effluent transfer pipeline to supply treated effluent to nearby customers. The Project was developed to upgrade the STP's treatment processes, reduce nutrient discharges to the Hawkesbury Nepean River, amplify the STP's capacity to cater for population growth and provide opportunities for effluent re-use. An advanced tertiary sewage treatment level is proposed which would produce effluent of suitable quality for both river discharge and also agricultural irrigation.

SWC is required to obtain approval for the Project from the Minister under Division 4 Part 5 of the *Environmental Planning and Assessment Act 1979*. This report was prepared in accordance with Section 115C of the Act, which requires that the Minister obtain a report from the Director General before making a decision. The report's purpose is to review the Project's environmental impact statement (EIS), issues raised in representations to the EIS's public exhibition, further information provided by the Proponent and any other information identified by the Department concerning the Project's potential environmental impacts.

The report documents this independent assessment of the proposal. It concludes that the:

- proposal satisfies its objectives and is a suitable alternative of those considered; and
- proposal's potential environmental impacts can be mitigated to an acceptable level by adopting management measures identified in this report and reflected in the recommended Conditions of Approval.

The proposal is recommended for approval subject to the recommended conditions.

Sam Haddad
Deputy Director General
Department of Infrastructure, Planning and Natural Resources

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GLOSSARY AND ABBREVIATIONS

ADWF	average dry weather flow
ANZECC	Australian and New Zealand Environment and Conservation Council
CPW	Cumberland Plain Woodland
DEC	Department of Environment and Conservation
Department, the	Department of Infrastructure, Planning and Natural Resources
DIPNR	Department of Infrastructure, Planning and Natural Resources
Director General	Director General of the Department of Infrastructure, Planning and Natural Resources
DLWC	Department of Land and Water Conservation (now DIPNR)
EIS	environmental impact statement
EMAI	Elizabeth Macarthur Agricultural Institute
EMP	environmental management plan
EPA	Environment Protection Authority (now DEC)
EP&A Act	*Environmental Planning and Assessment Act 1979*
HNRMF	Hawkesbury Nepean River Management Forum
HRC	Healthy Rivers Commission
LALC	Local Aboriginal Land Council
mg/L	milligrams per litre
Minister	Minister for Infrastructure and Planning
ML/day	Megalitres a day
NPWS	National Parks and Wildlife Service (now DEC)
POEO Act	*Protection of the Environment Operations Act 1997*
Project	West Camden Sewage Treatment Plant Upgrade and Amplification
SOJI	Statement of Joint Intent
SPS	sewage pumping station
STP	sewage treatment plant
SWC	Sydney Water Corporation
TN	total nitrogen
TP	total phosphorus
TSC Act	*Threatened Species Conservation Act 1995*

EXECUTIVE SUMMARY

The Project

Sydney Water Corporation (SWC) is seeking the approval of the Minister for Infrastructure and Planning for a proposed amplification and upgrade of the existing West Camden Sewage Treatment Plant (STP).

West Camden STP has a current capacity of 10.8 megalitres per day (ML/day). It is proposed to increase this to 22.9 ML/day, a capacity sufficient to cater for the population predicted for the year 2021. The amplified and upgraded STP would treat sewage through an advanced tertiary process which requires construction of the following works:

- amplified inlet works including an associated sewage pumping station;
- a new secondary treatment process for nutrient removal;
- amplified tertiary clarifiers and filters to reduce suspended solids and phosphorus;
- amplified disinfection facilities using chlorination; and
- upgraded biosolids handling facilities.

The Project also includes the construction of a pipeline to transfer treated effluent from the STP to agricultural customers.

The STP would continue to discharge treated effluent to the Hawkesbury Nepean River via an existing licensed discharge point into a tributary of Matahil Creek.

The Project has an estimated cost of $38 million and would create about 40 jobs during construction.

EIS Exhibition and Approval Process

SWC determined that the West Camden Upgrade and Amplification Project had a potential to significantly affect the environment and accordingly prepared an environmental impact statement (EIS). As SWC is both a Proponent and determining authority, the Proposal is subject to assessment under Division 4, Part 5 of the EP&A Act and the approval of the Minister is required.

An EIS for the Project was publicly exhibited between 23 November 2001 and 18 January 2002 and ten representations were received. There were no representations from private individuals.

SWC sought the approval of the Minister for the Project on 24 January 2003. This Report has been prepared in accordance with Section 115C of the EP&A Act which requires the Director General to assess and report to the Minister on the Project.

Project Justification

Justification for the Project was based on:

- a need to upgrade the STP treatment process to reduce nutrient loads discharged to the Hawkesbury Nepean River, specifically the Nepean River adjacent to Camden;
- a need to amplify the plant's capacity to cater for population growth. The growth would come from:

  - within the existing catchment, principally in the Spring Farm, Elderslie and Smeaton Grange areas;
  - unsewered areas within the existing catchment such as Kirkham and Cawdor;
  - the transfer of sewage from the Oaks, Oakdale, Belimbla Park and Menangle, Menangle Park Priority Sewerage Program areas; and
- an opportunity for beneficial effluent re-use by providing effluent to nearby irrigators.

The Project was also stated to be consistent with SWC's long-term strategic plan for ecological sustainable water and waste water management as documented in *WaterPlan 21*.

Environmental Impact Assessment

The Department's assessment of the Project's environmental impacts identified four priority issues:

- water quality;
- effluent re-use;
- environmental flows and river extraction; and
- hydrology and flooding.

Water Quality

The water quality issue that principally concerned the Department was the potential for the Project to increase nutrient loads discharged to the Hawkesbury Nepean River. One of the Project needs identified in the EIS was to "reduce nutrient loads to the Hawkesbury Nepean River, specifically the Nepean River adjacent to the township of Camden". The EIS and Representations Report contain apparently conflicting information on the effect of the Project.

DEC advised that the apparently conflicting information could be consistent. This was on the basis that should sewage flows increase due to urban growth and be treated and discharged without improvements to the existing STP, the current STP performance would decrease and nutrient loads would increase. If treatment processes were improved, the overall nutrient loads, although possibly higher than the current loads, would be less than the "do-nothing" scenario.

In consideration of these issues and acknowledging the need to service urban growth areas, the Department considers that the effluent quality targets proposed by SWC are adequate. However, the potential for adverse water quality impacts in waterways downstream of the STP could best be limited by instituting an effluent re-use scheme.

To clarify and confirm the water quality objectives stated in the EIS and Representations Report the Department recommends a Condition that consolidates the effluent quality targets proposed by SWC. The Condition also requires that these targets be met following optimisation of the STP process or within a maximum 18 months of commencing operation whichever is shorter. The Department considers it important that the stated objectives are attained within a defined time period.

Effluent Re-use

The status and implementation of the effluent re-use scheme was the most frequently raised issue in representations. Major concerns included:

- effluent re-use is an essential part of the Project, but on-farm re-use does not form part of the Project for which SWC sought approval;
- the potential for adverse impacts from inappropriate management of on-farm irrigation; and
- the lack of detail about management arrangements and relationships for the effluent re-use scheme.

Implementing an effluent re-use scheme is considered by the Department as integral to meeting the EIS objectives and Government policy and planning initiatives for the Hawkesbury Nepean River catchment. There is uncertainty associated with the future operation of an effluent re-use scheme supplied by the upgraded West Camden STP. The uncertainty arises as the EIS proposal only includes the construction of an effluent delivery pipeline and does not include any definite demonstration of uptake from the pipeline, i.e. there are no confirmed customers for the effluent.

To ensure that an effluent re-use scheme is implemented the Department recommends a Condition which requires that SWC provide an Effluent Re-use Report to the Department. The report is to include details of the sites to be used for effluent re-use, their long-term sustainability and when they are to be commissioned. The Department's Condition is consistent with advice received from the DEC concerning effluent re-use from West Camden STP. The DEC advised that it will include a pollution reduction program in the existing West Camden STP licence requiring implementation of a re-use scheme by the end of 2006.

Environmental Flows and River Extraction

The in-stream flow of the Hawkesbury Nepean River has been highly modified over time. Its wide range of flow variability results from both natural and anthropogenic influences. In dry weather, it is estimated that approximately 60% of the flow in the Hawkesbury Nepean River immediately downstream of South Creek is from STP discharges and the remainder from river system base flows. The contribution to river flow from STPs, especially during low flow periods, is acknowledged and their contribution is an important factor in integrated planning for the Hawkesbury Nepean River.

The Department and the DEC consider that increasing the volume of effluent directly discharged to the Nepean River to 22.9 ML/day would not be consistent with the Statement of Joint Intent (SOJI) for the Hawkesbury Nepean River. However, that level of discharge is not likely to occur provided the Project involves an effluent re-use component.

The (then) DLWC acknowledged the importance of the contribution of the effluent discharge from West Camden STP to base flows in Matahil Creek and the upper Nepean River in its representation to the EIS. The DLWC recommended that any irrigation supply be provided from increased STP inflows and that the current STP effluent discharge be maintained as a base level. The recommended Condition requires that the West Camden STP maintain a minimum effluent discharge to Matahil Creek. The Condition also allows the minimum to be reduced by the Director General following consultation with the DEC and SWC. Any reduction would reflect decreases in licensed river water extraction resulting from effluent re-use.

Hydrology and Flooding

The STP has an existing discharge to Matahil Creek which is contained within the creek low flow channel. Concerns were expressed about the impact of the proposed increase in STP discharge on Matahil Creek and downstream recreation areas. These concerns included:

- the reliability of modelling the impact of increased flows from the STP;
- the potential for increased flooding in downstream waterways and recreation areas; and
- concerns about the quantity of water flowing through Bicentennial Park and degradation of riparian vegetation.

SWC provided additional flooding information in its Representations Report indicating that the Project would not significantly affect downstream flooding characteristics. The Department considers that the additional information provided by SWC is reliable and would be representative of the Project's impacts. To ensure stream flow conditions are considered in the detailed design of the STP the Department recommended that the Project "not worsen" downstream flood characteristics.

Conclusions and Recommendations

The Department recognises that the Project is essential to service urban growth in existing and new release areas. The proposed option would be the best of those considered and substantially better than doing nothing. However, ensuring the implementation of an effluent re-use scheme and attaining a high quality effluent would be essential in reducing the pollutant loads in the Hawkesbury Nepean River.

The Project is also closely aligned with other Government initiatives for the Hawkesbury Nepean River including the Statement of Joint Intent (SOJI) and Hawkesbury Nepean River Management Forum. It would enable SWC some flexibility to implement outcomes of initiatives involving both river extraction and environmental flows.

The Department has undertaken an assessment of the likely environmental impacts of the Project. In particular, it considered key issues associated with water quality, the implementation of an effluent re-use scheme, environmental flows and river extraction, and hydrology and flooding. Other issues examined were flora and fauna, air quality, noise, traffic and transport, heritage, soil and water management, visual impact and landscape design and hazards and risks. The Department's review concluded that, provided comprehensive mitigation measures were implemented, the adverse impacts of the Project could be reduced to an acceptable level.

The Department recommends that SWC prepare comprehensive environmental management plans for the construction and operation stages of the Project. The Plans are to describe how the mitigation measures contained in the EIS, Representations Report and the recommended Conditions of Approval are to be practically implemented.

The Department's assessment concludes that, provided the recommended Conditions of Approval are adopted, the Project could be approved by the Minister.

1. INTRODUCTION

1.1 The Project

SWC proposes to upgrade and amplify the existing West Camden Swage Treatment Plant (STP) and construct a pipeline able to supply treated effluent for re-use by agricultural customers. The STP upgrade and amplification works are contained within the existing STP site boundaries.

1.2 EIS Exhibition and Approval Process

SWC is a statutory State owned corporation under the *State Owned Corporations Act 1989* (SOC Act). As such it is a public authority under the EP&A Act and a determining authority under Part 5 of the Act.

SWC determined that the West Camden Upgrade and Amplification Proposal had a potential to significantly affect the environment and accordingly prepared an environmental impact statement (EIS) for the Project. As SWC is both a Proponent and determining authority, the Proposal is subject to assessment under Division 4, Part 5 of the EP&A Act and the approval of the Minister is required.

An EIS for the Project was publicly exhibited between 23 November 2001 and 18 January 2002. SWC received ten representations to the EIS. Copies of all representations were forwarded to the Department as required by the EP&A Act.

1.3 Request for Approval of the Minister of Infrastructure and Planning

SWC sought approval for the Project from the Minister in letter dated 24 January 2003. The request for approval was accompanied by a Representations Report which presented SWC's response to issues raised in representations to the EIS's public exhibition.

1.4 Purpose of this Report

This report was prepared in accordance with section 115C of the EP&A Act which requires that the Director General of the Department assess and report to the Minister on a proponent's proposed activity. The report documents the Department's independent environmental assessment of the Project's EIS, issues raised in representations to the public exhibition of the EIS, the Proponent's report on those representations and other matters relevant to the Project.

2. PROJECT DESCRIBED IN THE EIS

This section provides a description of the Project described in the EIS. It provides an overview of the information presented in the EIS and does not necessarily represent the Department's views.

2.1 Need for the Project

2.1.1 Existing Sewerage System

The West Camden STP was constructed in the 1970s and originally designed as a conventional activated sludge plant providing secondary treatment. It had an average dry weather flow (ADWF) capacity of 10.8 ML/day and removed suspended solids and organic material. In 1991 the STP was upgraded by improving nutrient removal and the plant operations optimised using computer modelling. Its capacity remained 10.8 ML/day.

The STP serves a reticulation catchment of approximately 5,900 hectares including the suburbs of Camden, Mount Annan, Narellan Vale, Currans Hill, Smeaton Grange, Harrington Park, Elderslie and Camden Aerodrome. Six sewage pumping stations (SPS) transfer sewage from these suburbs to the STP. A seventh SPS (SPS 440) is located at the STP to pump the transferred sewage to the STP inlet works.

2.1.2 Need

The West Camden STP Upgrade and Amplification Project was identified by SWC as there was:

- a need to upgrade the STP treatment process to reduce nutrient loads discharged to the Hawkesbury Nepean River, specifically the Nepean River adjacent to Camden;
- a need to amplify the plant's capacity to cater for population growth. The growth would come from:
  - within the existing catchment, principally in the Spring Farm, Elderslie and Smeaton Grange areas;
  - unsewered areas within the existing catchment such as Kirkham and Cawdor;
  - the transfer of sewage from the Oaks, Oakdale, Belimbla Park and Menangle, Menangle Park Priority Sewerage Program areas; and
- an opportunity for beneficial effluent re-use by providing effluent to nearby irrigators.

2.2 Alternatives Considered

2.2.1 Strategic

SWC's long-term strategic plan for ecological sustainable water and waste water management is documented in WaterPlan 21 published by SWC in 1997. One of the long-term goals in that plan is to improve water quality in the Hawkesbury Nepean River. Strategies to achieve that goal are set out by SWC in their Hawkesbury Nepean Waste Water Strategy. These strategies include:

- advanced treatment with river discharge;
- coastal transfer for ocean discharge;

- centralised sewage treatment with some re-use either non-potable or potable (indirect or direct); and
- decentralised effluent treatment with some re-use.

Modelling undertaken by SWC for the Hawkesbury Nepean Waste Water Strategy found that improvements at an individual STP level could deliver a higher degree of environmental benefit to receiving waters compared with the other strategies.

2.2.2 West Camden STP

SWC identified three options to upgrade and amplify the West Camden STP:

- option one: advanced treatment with full creek discharge;
- option two: advanced treatment with creek discharge and provision for partial effluent re-use; and
- option three: conventional treatment with creek discharge and full effluent re-use in dry weather.

SWC determined that the preferred option for West Camden STP was option two, advanced treatment with creek discharge and the infrastructure to enable the supply of treated effluent.

No changes to the sewage reticulation system were proposed as part of the Project.

2.3 Project Description

2.3.1 STP

The STP would be amplified by increasing its capacity to 22.9 ML/day. That capacity is sufficient to cater for the predicted population growth up to the year 2021. Sewage treatment would be upgraded to an advanced tertiary process producing treated effluent of a suitable quality for irrigation re-use. Actual construction works identified in the EIS were:

- amplified inlet works;
- an upgrade of SPS 440;
- a new secondary treatment process for nutrient removal (both nitrogen and phosphorus). The actual process would be determined during detailed design;
- amplified tertiary clarifiers and filters. These reduce suspended solids and phosphorus;
- amplified disinfection facilities using chlorination; and
- upgraded biosolids stabilisation and dewatering facilities to facilitate beneficial re-use.

The STP would continue to discharge treated effluent to the Hawkesbury Nepean River via an existing licensed discharge point into a tributary of Matahil Creek.

2.3.2 Effluent Transfer

A treated effluent pumping station would be constructed within the STP boundary with a capacity to handle the volume of effluent required for the irrigators. An existing oxidation pond would act as the storage to the pumping station. The maximum supply rate for the effluent pumping station was stated to be 10 ML/day.

The EIS identified two effluent transfer pipelines, a northern pipeline and a southern pipeline. The northern pipeline extends to Brownlow Hill where the University of Sydney farms and other turf and

dairy farms are potential users. The southern pipeline extends to the Elizabeth Macarthur Agricultural Institute. Both pipelines would be constructed mostly along road verges. The timing of construction of one or both the pipelines depends on factors such as feasibility and negotiations with potential customers.

The Project does not include the operation of an effluent re-use scheme.

2.3.3 Cost and Program

The EIS estimates the costs of the Project to be:

- $34.5 million to upgrade and amplify the STP;
- $0.2 million for the effluent transfer pump station with $2.8 million for a northern pipeline and $3.0 million for a southern pipeline; and
- annual operation and maintenance costs of $1.95 million.

Funding would be provided from SWC's capital works program.

The Project would take 18 months to construct and a projected completion date of mid 2004 was proposed.

2.4 Major Benefits and Adverse Impacts Identified in the EIS

The EIS states that the Project would:

- increase capacity to service population growth within the catchment;
- meet regulatory and stakeholder requirements;
- meet environmental regulations in the management of the STP;
- facilitate increased beneficial re-use of effluent and biosolids; and
- contribute to achieving WaterPlan 21 goals relevant to treatment plants discharging to the Hawkesbury Nepean River.

The EIS recognises that the construction and operation of the Project would create a range of adverse impacts including:

- surface water quality;
- ground waters at re-use sites;
- aquatic fauna and flora;
- terrestrial flora and fauna;
- heritage;
- construction and operation noise;
- odours from the amplified STP;
- visual change at the STP;
- construction traffic; and
- increased capital and operating costs for SWC.

The EIS did not prioritise or identify any key issues for the Project.

3. SUMMARY OF REPRESENTATIONS

This section summarises the issues, concerns or comments made in representations to the public exhibition of the EIS.

3.1 Summary of EIS Representations Received

Ten representations were received in response to the EIS's public exhibition. Representations were received from:

- State Government:
  - NSW Agriculture
  - DLWC
  - EPA
  - NSW Fisheries
  - Royal Botanic Gardens Sydney
- Local Government:
  - Council of Camden
  - Wollondilly Council
- Catchment Management Groups:
  - Hawkesbury Nepean Catchment Foundation
  - Hawkesbury Nepean River Management Forum
- Local Interest Group – Management Committee for Camden Bicentennial Park

Five representations provided qualified support for the Project.

3.2 Issues Raised in Representations

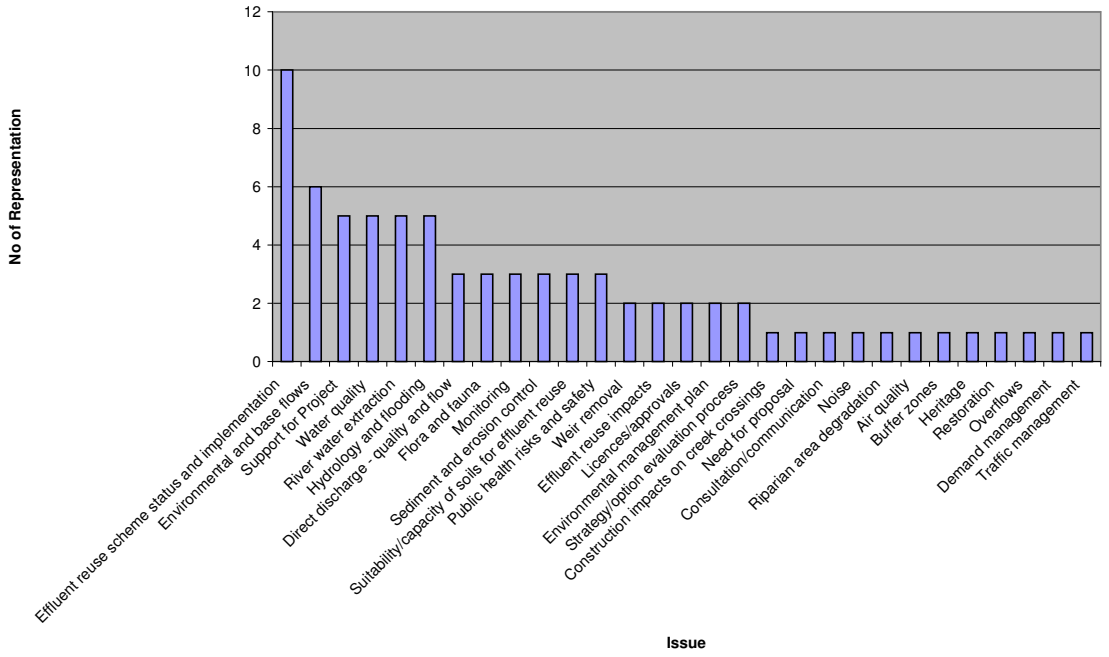
SWC included a summary of the issues raised in representations to the EIS in its Representations Report. The Department has undertaken an independent assessment of the issues raised in representations and generally concurs with SWC's interpretation. Figure 3.1 provides the Department's summary of the type and frequency of issues raised in representations.

A summary of each representation follows.

3.2.1 NSW Agriculture

NSW Agriculture's representation was mainly concerned with the potential for the Elizabeth Macarthur Agricultural Institute (EMAI) to be used as a site for effluent re-use. Support in principle was expressed for the use of the EMAI for effluent re-use subject to negotiation of a commercial agreement.

Figure 3.1 Identification of Issues in Representations



3.2.2 DLWC

DLWC (now part of the Department) raised two issues, soils at re-use sites and the relationship of river extraction and effluent re-use. Soil issues mainly concerned the potential for increased salinity in the soils at effluent re-use sites.

DLWC advised that the claim in the EIS that supply of effluent to irrigators will have a one-to-one reduction in river water extraction is unlikely to occur. DLWC cannot require a water licensee to surrender their entitlement because another source of water becomes available. Licensees would be likely to either keep their water access entitlement or sell this to another irrigator. DLWC also advised that the current discharge from the STP should be maintained as this provides for irrigation water downstream of the STP, particularly under dry conditions.

3.2.3 EPA

The EPA (now part of the DEC):

- expressed support for the upgrade and amplification of the West Camden STP but did not support increased direct discharge from the STP to either Matahil Creek or the Nepean River pending the outcomes of the Hawkesbury Nepean River Management Forum;
- considered that SWC has a responsibility to consider the effects of any effluent re-use scheme;
- considered that expanding the effluent re-use scheme to 100% effluent re-use is necessary to achieve the objectives of the NSW Weirs Policy;
- considered that firm arrangements with potential irrigators must be pursued to achieve the maximum benefit from the Project;
- considered that the use of the 50th percentile for water quality parameters was inadequate; and

- advised that they may impose similar or more stringent discharge criteria than those applied to the Picton STP.

3.2.4 NSW Fisheries

NSW Fisheries supported the upgrade of the STP as improvements to water quality would reduce impacts on the aquatic environment. NSW Fisheries indicated their major concern was the maintenance of environmental flows in waterways, more particularly maintenance of minimum flows to maintain fish passage. It was thought that effluent re-use may provide opportunities to reduce river extraction and also remove weirs. Other issues raised were:

- SWC needed to prepare an eight part test for the Macquarie Perch;
- creek crossings should follow NSW Fisheries Policy and Guidelines; and
- the buffer zones proposed around effluent irrigation sites (10-20 metres) were extremely inadequate.

3.2.5 Royal Botanic Gardens Sydney

The representation of the Royal Botanic Gardens concerned the potential for effluent to be supplied to the Mt Annan Botanic Garden.

3.2.6 Council of Camden

The Council of Camden expressed general support for the Project but:

- sought assurances that the amplification could be achieved and impacts contained within the STP's existing buffer zone;
- was particularly concerned with noise and odour impacts;
- believed there was a potential for an expanded use of effluent; and
- noted the potential for poorly managed effluent irrigation to cause significant environmental impacts and requested details on effluent application management.

3.2.7 Wollondilly Council

Wollondilly Shire Council (WSC) indicated its support of the transfer of sewage from The Oaks, Oakdale, Belimbla Park and Menangle to West Camden STP. Council considered that the EIS does not properly consider potential impacts on the Camden Park release area, especially potential impacts from spray irrigation of treated effluent. WSC asked that if effluent is supplied for irrigation would it be possible to review existing river water extraction licences. WSC considers that there is a significant demand for effluent re-use.

3.2.8 Hawkesbury Nepean Catchment Foundation

The Hawkesbury Nepean Catchment Foundation (HNCF) supports the Project but raised the following:

- the Project should not be approved until the important land re-use aspects are "locked in". Conditions of consent [sic] are required to prevent this EIS becoming a treat and discharge proposal;
- effluent quality targets should be presented in 50th and 90th percentile values;
- consideration should be given to reducing the salinity of treated effluent;
- every option should be taken to minimise or eliminate partially treated or raw sewage overflows from the STP; and

- there is an error in the identification of the preferred option from the community survey and value management workshop.

3.2.9 Hawkesbury Nepean River Management Forum

The Hawkesbury Nepean River Management Forum (HNRMF) considered that it was not appropriate for it to comment in detail on the EIS but advised that effluent re-use should only be promoted where it replaced existing water use demands.

3.2.10 Management Committee for Camden Bicentennial Park

Camden Bicentennial Park Management Committee expressed concern about the continued use of Matahil Creek as the STP discharge point. In particular their concerns related to the quality and quantity of water flowing through the Camden Bicentennial Park. Specific concerns included the:

- reliability of impact modelling of increased flows to Matahil Creek;
- potential for increased flooding in the Park;
- impacts on stream rehabilitation works undertaken in the Park;
- public health risks associated with wet weather discharges and the future quality of water downstream of the STP; and
- effects on the remnant river plain community that exists at the junction of the tributary and Matahil Creek.

4. MODIFICATIONS TO THE PROJECT FOLLOWING EIS EXHIBITION

This Section describes the modifications to the Project identified in the Representations Report. Those modifications were made by the Proponent following exhibition of the EIS in response to issues raised in representations and further investigations.

SWC modified the Project following the EIS exhibition. The modifications are outlined in Section 2.4 of the Representations Report and involved the routes of the effluent re-use pipelines.

The northern pipeline route was amended to remove the Brownlow Hill Loop Road and avoid potential impacts on Cumberland Plain Woodland found along that stretch of road.

The southern route had the section of pipeline that ran through the EMAI site removed from the Project. If the southern route is chosen as the preferred route, then further environmental impact assessment, including a heritage assessment, would be undertaken.

5. ASSESSMENT OF THE PROJECT'S KEY ISSUES

This Section provides an assessment of the Project's key environmental issues. Those issues were identified from an examination of the EIS and issues raised in representations made during the exhibition period together with the Proponent's response presented in its Representations Report.

This Section should be read in conjunction with the Proponent's Representations Report to understand how all issues raised in representations were addressed.

5.1 Water Quality

5.1.1 Background

Water Quality

The EIS used three water quality indicators to assess river water quality and the ecological impacts of both the existing STP operations and the proposed upgrade and amplification. These were chlorophyll-*a,* total nitrogen (TN) and total phosphorus (TP). Chlorophyll-*a* provides a measure of the presence of nuisance concentrations of algal blooms in waterways. High levels render aquatic habitats unsuitable for many species. In-stream chlorophyll-*a* levels in the Nepean River, downstream of the STP have been found to peak at Sharpes Weir in summer and dry weather conditions.

Water quality modelling outlined in the EIS indicated that algal growth could be contained to a satisfactory level for 92 per cent of time in 2021 at Sharpes Weir if the following performance targets were achieved: 22.9 ML/day ADWF (i.e. full river discharge of effluent from the STP), 0.04 mg/L TP and 25 mg/L TN. The modelling also indicated that the concentration of nitrogen in effluent was not a key factor in algae growth and that high TN:TP ratios were believed to inhibit the growth of blue-green algae. The EIS indicated that, in response to recommendations from the EPA and Healthy Rivers Commission for the balanced reduction of nitrogen and phosphorus, the TN target for the upgraded West Camden STP would be 7.5 mg/L instead of the modelled concentration of 25 mg/L.

The EIS proposed nutrient concentration targets of 7.5 mg/L for TN and 0.04 mg/L for TP for the Project.

Water Quality and Aquatic Flora and Fauna

A baseline ecological survey was undertaken and macroinvertebrates, fish, amphibians and aquatic flora were assessed. The survey found that the number of invertebrate taxa present in Matahil Creek downstream of the West Camden STP was significantly lower than the taxonomic richness at nearby reference sites. The lower number of taxa suggested that the effluent discharged from the STP was having a deleterious effect on the aquatic ecosystem in the small creeks but this impact did not extend to the Nepean River. Studies also noted that Matahil Creek and its tributary were congested with macrophytes.

5.1.2 Key Issues

Representations to the EIS raised the following issues about effluent and water quality:

- the use of the 50th percentile concentrations was inadequate;

- the EPA advised that the proposed quality limits for the STP specified in its POEO Act licence may change over time;
- concern about the quantity and quality of water flowing through Bicentennial Park; and
- effluent needs to be of a quality that does not limit the potential for future agricultural activities.

The Department was principally concerned with the potential for the Project to increase nutrient loads discharged to the River.

5.1.3 Consideration of Key Issues

One of the Project needs identified in the EIS was to "reduce nutrient loads to the Hawkesbury Nepean River, specifically the Nepean River adjacent to the township of Camden". The EIS and Representations Report contain apparently conflicting information on the effect of the Project. Information presented in the EIS indicates that the total load of nutrients (TP and TN) discharged from the STP will increase. The EIS data is summarised in Table 5.1 and indicates that TP concentration and load will increase while, although the TN concentration would decrease, the TN load would increase.

Table 5.1 Nutrient Data from the EIS

	Current (1999-2000)		Proposed (2021)	
	Phosphorus	**Nitrogen**	**Phosphorus**	**Nitrogen**
Volume. ML/d	6.9		22.9	
Concentration, mg/L	0.03	16.5	0.04	7.5
Daily load, kg*	0.21	114	0.92	172

*Load is indicative only, calculated from volume times concentration

There is a similar inconsistency in the computer modelling of the effect of 2021 effluent flows on algae growth. Modelling concluded that these would not result in excessive algae growth. This was at odds with the results of monitoring presented in the EIS which concluded that the current (1999-2000) discharge had "a localised impact on the waterways downstream ……. particularly evident in regard to nutrient and chlorophyll-*a* concentration".

The Department sought advice from DEC on this issue and DEC advised that the apparently conflicting conclusions in the EIS could be correct. DEC indicated that should sewage flows increase due to urban growth and be treated and discharged without improvements to the existing STP, the current STP performance would decrease and nutrient loads would increase. If treatment processes were improved, the overall nutrient loads, although possibly higher than the current loads, would be less than the "do-nothing" scenario.

In response to questions from the Department SWC provided further data on the performance of the STP in reducing phosphorus concentration. The data provided on the concentration and discharge of nutrients from West Camden STP was inconsistent, probably caused by different reporting intervals and interpretations of statistical reporting.

Consolidated data was available on the SWC website. Table 5.2 summarises data for West Camden STP from the most recent Environmental Indicators Compliance Report published by SWC.

Table 5.2 Annual Discharge Volume and Nutrients from West Camden STP

Year	97/98	98/99	99/00	00/01	01/02	2021
Discharge Volume						
- ML/year	1,921	2,616	2,867	2,894	3,245	8,358
- average daily flow ML/day	5.3	7.2	7.9	7.9	8.9	22.9
Total Nitrogen						
- kg/year	30,644	44,612	47,271	45,166	46,074	62,000
- average concentration mg/L	15.9	17.1	16.5	15.6	14.2	7.5
Total Phosphorus						
- kg/year	565	564	231	167	313	334
- average concentration mg/L	0.29	0.22	0.08	0.06	0.10	0.04

Source (except 2021): SWC Environmental Indicators Compliance Report 2002.

Data from the Compliance Report indicates that the year 2021 flows would result in higher annual loads of both TN and TP discharged to the River than the three most recent reported years. Concentrations of both nutrients would be lower than any of the reported years. The effluent volume also represents a significant proportion of river flows under dry weather conditions as discussed in the next section. Based on this data the Project is likely to result in deteriorating water quality downstream of the STP because of the significant increase in discharge volume proposed and despite the lower nutrient concentrations in the effluent discharged. This deterioration is likely to be less than the "do-nothing" scenario as postulated by both SWC and the DEC. It is noted that the:

- TP concentration proposed by SWC is probably the best that could be economically and consistently attained with current best practise sewage treatment technologies; and
- increase in discharge volume is directly related to the growth in population within approved urban release areas within the catchment served by the STP.

In consideration of these issues and acknowledging the need to service urban growth areas, the Department considers that the effluent quality targets proposed by SWC are adequate. The potential for adverse water quality impacts in waterways downstream of the STP could best be limited by instituting an effluent re-use scheme as discussed in the following section. The Department also notes that the SOJI and associated investigations are taking a broader look at the inputs affecting water quality in the Hawkesbury Nepean River including all of the STPs controlled by SWC.

To ensure that the Project meets the water quality objectives stated in the EIS and Representations Report the Department recommends Conditions of Approval Nos. 39 and 49. Condition 39 consolidates the effluent quality targets proposed by SWC and requires these to be met following optimisation of the STP process or within 18 months of operation commencing whichever is shorter. The Department considers it important to impose this Condition as, although the DEC advised that it would vary the POEO Act Licence for the STP after the STP Upgrade is commissioned, it did not indicate what criteria would be imposed. The Department considers it important that the objectives stated by SWC are attained following the STP Upgrade and Amplification commissioning. To avoid conflicting requirements the Department's Condition also states that the Condition would be superseded when the POEO Act Licence specifies the same or lower concentration limits.

To minimise the impacts of STP overflows on water quality, recommended Condition of Approval No 49 limits wet weather overflows to 18 overflow events every ten years. This criterion is nominated by SWC in its EIS but the POEO Act Licence for the scheme contains a less stringent criterion. To avoid conflicting requirements the Department's Condition also states that the Condition would be superseded when the POEO Act Licence specifies the same or lower overflow events.

5.2 Effluent Re-use Scheme

5.2.1 Background

The Project involves the upgrade and amplification of the West Camden STP and includes the construction of a transfer pipeline able to supply effluent to nearby customers. An effluent pumping station would be constructed within the boundary of the STP with the capacity to handle the volume of effluent required for irrigation. Two alternative pipeline routes were proposed to transfer effluent to potential irrigation areas. The EIS stated that the timing of the construction of one or both of the pipelines would depend on factors such as feasibility and negotiations with potential customers. SWC stated that in the short-term only one irrigation area would be supplied. The EIS did not address the operation of on-farm effluent re-use which would be subject to further environmental impact assessment and approval.

SWC undertook a number of studies to identify potential effluent re-use irrigation opportunities within the vicinity of the STP. Two possible re-use areas were identified:

- a northern irrigation area (Option 1) encompassing Sydney University's Corstorphine Farm and surrounding dairies and farms along Cobbity Road; and
- a southern irrigation area (Option 2) consisting of the Elizabeth Macarthur Agricultural Institute (EMAI) and Camden Park Estate.

A land suitability assessment was undertaken for these sites in the EIS. It concluded that, provided irrigation is scheduled appropriately, the nitrogen and phosphorus supplied in the effluent would be used by the agricultural crops, pastures and turf without any movement of these nutrients off-site. The main soil problems in the northern and southern irrigation areas include soil salinity, soil sodicity, limited ability to bind plant nutrients and impermeable sodic subsoils. The EIS outlines general mitigation measures for effluent irrigation and safeguards for human health, soil management, groundwater protection and protection of surface waters.

The Representations Report advises that effluent re-use site/s would be subject to a separate environmental impact assessment process for the operation of an effluent re-use scheme. The EIS states that site specific environmental management plans (EMPs) would be prepared for the selected site/s. SWC intends to formalise the requirement for both the environmental impact assessment and EMPs into customer supply contracts.

5.2.2 Key Issues

The status and implementation of the effluent re-use scheme were the most frequently raised issues in representations. Major concerns were:

- effluent re-use is an essential part of the Project, but on-farm re-use does not form part of the Project for which SWC is seeking approval;
- the potential for adverse impacts from inappropriate management of on-farm irrigation;
- the lack of detail about management arrangements and relationships for the effluent re-use scheme; and
- there is significant demand for effluent re-use in both Camden and Wollondilly local government areas which was not addressed in the EIS.

5.2.3 Consideration of Key Issues

There are a number of investigations, reports or forums that are relevant to effluent re-use from West Camden STP. These are best summarised in the Statement of Joint Intent (SOJI) to which a number of public authorities were signatories including the DLWC, EPA, Department of Urban Affairs and Planning Sydney Catchment Authority and SWC. The SOJI provides a framework for implementation of a whole-of-government response to the NSW Healthy Rivers Commission's findings on the Hawkesbury Nepean River. The SOJI includes development of an integrated effluent management strategy, an integrated water quality and river flow management strategy and the removal of weirs on the upper Nepean.

Elements of the SOJI Draft Integrated Effluent Management Strategy relevant to the Project include:

- West Camden STP is one of five STPs identified by SWC as "high impact" STPs because of their significant contribution to nutrient loads in the Hawkesbury Nepean River.
- Consideration of effluent irrigation within the Sydney Basin is an important component of the SOJI.
- Downstream of Camden the SOJI objectives for nitrogen and phosphorus are exceeded for much of the time.

Effluent irrigation is an important component of the SOJI for the Hawkesbury Nepean River and in the development of recommendations for environmental flow regimes. Approaches that optimise the use of effluent and reduce the impact of effluent discharged to the environment are promoted. As a significant contributor to the river health of the Hawkesbury Nepean River, and a signatory to the SOJI SWC has a responsibility to work towards the successful implementation of a re-use scheme to meet Government policy and community expectations for the river.

The Draft Integrated Effluent Management Strategy acknowledges that to ensure a successful re-use scheme there must be economic incentives for farmers to use the scheme. The draft Strategy includes a range of recommendations on this issue and it is understood that SWC is considering a range of economic incentives to promote the uptake of an effluent re-use scheme by local irrigators.

Irrigation of agricultural crops with effluent is an alternative to direct effluent discharge to river systems. Potential benefits include rivers with reduced nutrient loads, the beneficial use of nutrients for crop growth, reduced river extraction and provision of a reliable water supply for irrigation users. The EIS assessment was based on the premise that the upgraded STP could provide up to 10 ML/day of effluent for irrigation subject to customer demand. Given that the Project only relates to the provision of an effluent pipeline and not the operation of an effluent re-use scheme, the primary issue of concern in representations related to the uncertainty of an effluent re-use scheme's implementation. This issue was raised by every government agency and both councils.

The Department considers that there is uncertainty about whether a re-use pipeline would be constructed and whether re-use irrigation would eventuate. The positive impacts of the Project are predicated on the operation of an effluent re-use scheme as that is critical to reducing nutrient discharge to the river.

The EIS proposes amplification of the STP to treat an average dry weather flow of up to 22.9 ML/day by the year 2021. Implementation of a re-use scheme would provide a secure supply for irrigation customers and reduce the STP's discharge to Matahil Creek. The proximity of the STP to existing agricultural irrigators provides a major geographic advantage which should assist in the implementation of a re-use scheme.

Implementing an effluent re-use scheme is integral to meeting the EIS objectives and Government policy and planning initiatives for the Hawkesbury Nepean River catchment. As there is uncertainty associated with the future operation of an effluent re-use scheme supplied by the upgraded West Camden STP, the Department recommends Condition of Approval No 41. That Condition requires that SWC report to the Director General by mid 2005 on the implementation of a re-use scheme. The report must include details on the:

- requirements of the STP's licence under the POEO Act (POEO Act licence) for re-use;
- sites to be used for effluent application and their approval status;
- long-term availability and sustainability of the sites for effluent application. The sustainability analysis must include water balances and nutrient budgets;
- quantity of effluent to be re-used;
- monitoring requirements; and
- amount of licensed extraction from the Hawkesbury Nepean River replaced by the effluent supply.

The DEC advised that it will vary the POEO Act licence for West Camden STP to include a pollution reduction program (PRP) requiring a report on the details and methods for an effluent re-use scheme. The report would be required by the middle of 2005 and the PRP would also require implementation of a re-use scheme by the end of 2006. The Department's Condition is consistent with the advice from the DEC and, should the licence variation occur, it is envisaged that the report required by the Condition and the PRP would be the same document.

There was also some uncertainty about the routes of the effluent pipelines. To ensure these are constructed as proposed the Department recommends Condition of Approval No 40. This requires that SWC construct the pipelines consistent with the routes shown on Figure 2-4 of the Representations Report.

5.3 Environmental Flows and River Extraction

5.3.1 Background

Environmental flows in a river system ensure the function of key chemical, geomorphological, and ecological processes necessary for a healthy river ecosystem.

The EIS states that the STP releases on average 8 ML/day into Matahil Creek, approximately two kilometres from its confluence with the Nepean River. The discharge from the plant makes up the majority of base flow in Matahil Creek downstream from the STP and, during low flow conditions, represents 42% of Nepean River flow immediately downstream of Matahil Creek. The STP discharge is essential for maintaining flow in the River during dry periods.

Effluent discharge from the STP can also provide a significant proportion of the water extracted from the river by downstream irrigators during low flow periods. The EIS states that the proposed re-use at the STP focuses on maximising opportunities to use effluent without compromising the downstream environmental flow and irrigator requirements.

The *NSW Weirs Policy* is aimed at eliminating or alleviating the environmental impact of weirs. Weirs impound water to reserve water supplies for use in low river flow, as well as to provide water for

irrigation, aesthetic and recreational purposes. A number of large irrigators in the Camden area extract water retained by the Nepean River weirs.

The EIS states that the proposed effluent re-use scheme would focus on providing the pipeline infrastructure to existing licensed irrigators who extract water from the Nepean River. This has the potential to optimise the substitution of extracted river water with effluent. The EIS also states that the effluent supply for irrigation has the following benefits:

- replacing river extraction with a direct effluent supply. Future discharge volumes to the river could be maintained at similar, or greater, volumes than current discharges; and
- irrigators will depend less on weir pools to maintain adequate depth to allow water extraction.

5.3.2 Key Issues

Issues raised in representations were:

- Any proposed increases in water usage should be carefully regulated to ensure that environmental flows are not compromised.
- Expanding the effluent re-use scheme to a potential for 100% re-use is necessary to achieve the objectives of the NSW Weirs Policy.
- The EPA did not support increased direct discharge from the STP to either Matahil Creek or the Nepean River for quality and flow reasons, pending the recommendations of the Hawkesbury Nepean River Forum.
- Natural variations in environmental flows should be maintained to encourage native organisms.
- Supply to irrigators should be provided out of any increased water treatment, leaving the current delivery to the river (8 ML/day) unchanged.
- Base flows to the Nepean River should be met through the release of environmental flows from the upper catchment equivalent to the reduction in potable water demand achieved through effluent re-use.
- DLWC indicated that the EIS claim in that effluent supply to irrigators would have a one-to-one reduction in river extraction is unlikely to occur. DLWC also advised it could not require a water licensee to surrender a licence.
- Effluent re-use should only be promoted where it replaces existing water use demands and should not lead to an overall increase in total water demand.

5.3.3 Consideration of Key Issues

The SOJI for the Hawkesbury Nepean River provides a framework for the implementation of the Government's response to the findings of the Healthy Rivers Commission. The SOJI includes actions for determining and managing environmental flows to the River as well as River extraction. It has the following objectives for river extraction:

- the need to review the nine weirs on the upper Nepean River with a primary goal of removing the maximum number of weirs, consistent with providing alternate, secure water supply to existing users, and to ensure that any remaining weirs provide for fish passage;
- water licence conditions are to restrict water access in accordance with the application of water allocation and sharing rules as outlined in the SOJI;
- to implement improvements in the measurement and reporting of water use; and
- to provide for the use of effluent to replace riverine water supplies to existing licensed water users.

The in-stream flow of the Hawkesbury Nepean River has been highly modified over time. Its wide range of flow variability results from both natural and anthropogenic influences. In dry weather, it is estimated that approximately 60% of the flow in the Hawkesbury Nepean River immediately downstream of South Creek is from STP discharges and the remainder from river system base flows. The contribution to river flow from STPs, especially during low flow periods, is acknowledged and their contribution is an important factor in integrated planning for the Hawkesbury Nepean River.

Treated effluent from the upgraded plant could potentially replace irrigator extractions. While many of the large scale irrigators in the area are supportive of such a proposal they have expressed the need to ensure that their future access rights to water are maintained. These issues are being addressed under the SOJI.

The Department and the DEC consider that increasing the volume of effluent directly discharged to the Nepean River to 22.9 ML/day would not be consistent with the SOJI for the Hawkesbury Nepean River. That level of discharge is not likely to occur provided the Project involves an effluent re-use component. Effluent re-use was discussed in Section 6.1.

The DLWC acknowledged the importance of the contribution of the effluent discharge from West Camden STP to base flows in Matahil Creek and the upper Nepean River in its representation to the EIS. The DLWC recommended that any irrigation supply be provided from increased STP inflows and that the current STP effluent discharge be maintained as a base level. This requirement contained in recommended Condition of Approval No 38. This Condition also allows the Director General to vary the minimum discharge following consultation with SWC and the DEC. In considering varying the minimum discharge the Director General would need to consider:

- outcomes from implementing the SOJI;
- the Government's other initiatives for the Hawkesbury Nepean River; and
- any reduction in licensed river water extraction resulting from effluent re-use.

In summary, the Project would enable SWC some flexibility to implement outcomes of Government initiatives involving both river extraction and environmental flows. The STP would be able to supply effluent to the River and/or existing licensed river extractors. The best way that the Project could input to these initiatives is through the implementation of the SOJI and the Hawkesbury Nepean River Management Forum. SWC is a signatory or member of both and would be responsible for implementing outcomes and actions within its sphere of operations.

5.4 Hydrology and Flooding

5.4.1 Background

The STP currently discharges 8 ML/day. The projected increases in the amount of treated effluent are 18 ML/day by 2015 and 22.9 ML/day by 2021. The EIS did not contain information on the effects of this increase on the hydraulic behaviour of downstream waterways.

5.4.2 Key Issues Raised

Concerns were expressed about the impact of the proposed increase in STP discharge on Matahil Creek and downstream recreation areas. These concerns include:

- the reliability of modelling the impact of increased flows from the STP;

- the potential for increased flooding in downstream waterways and recreation areas; and
- concern about the quantity of water flowing through Bicentennial Park and degradation of riparian vegetation.

5.4.3 Consideration of Key Issues

In its Representations Report SWC presented the results of an analysis of changes in stream flow in Matahil Creek and its tributary. SWC has a flow monitoring station downstream of the STP on the Creek and this provided data to enable calibration of a model. Modelling results indicated:

- Under dry flow conditions the increase in stream flow height caused by increasing effluent flow from 8 to 22.9 ML/day was calculated to be less than 0.09 m. This increase would be contained in the main creek flow channel.
- Current dry weather flow from the STP represents about 0.25% of flow from a rainfall event with an average recurrence interval of three months (a frequent rainfall event). Increasing the dry weather flow from 8 ML/day to 22.9 ML/day would increase this proportion to 0.73%. The STP effluent flow represents an insignificant proportion of flow during frequent rainfall events and would not significantly alter flooding characteristics.
- Under wet weather conditions natural flows in Matahil Creek increase as would the discharge from the STP. Any increase in stream flow depth or velocity caused by the STP discharge was calculated to be negligible.

The Department considers that the additional information provided by SWC is reliable and would be representative of the Project's impacts. To ensure stream flow conditions are considered in the detailed design of the STP the Department recommends Condition of Approval No 42 which requires that the Project "not worsen" downstream flood characteristics. "Not worsen" is defined in the Condition to be:

- a maximum increase in inundation levels in Matahil Creek of 100 mm; and
- a maximum increase in inundation time of one hour for any rainfall event.

Recommended Condition of Approval No 43 requires that SWC amicably resolve any dispute between itself and any landowner about alterations to flooding characteristics caused by the Activity. If the parties cannot reach a mutually satisfactory resolution then the dispute resolution requirements of the Conditions of Approval apply.

6. ASSESSMENT OF OTHER ISSUES

This Section of the Report provides the Department's assessment of the Project's other environmental impacts. It is based on an examination of the EIS, issues raised in representations made during the EIS exhibition period together with the Proponent's response to these issues and further discussions between the Department and the Proponent.

This Section should be read in conjunction with the Representations Report to understand how all issues raised in representations were addressed.

6.1 Flora and Fauna

6.1.1 Background

The STP site contains little vegetation. It has a number of remnant Grey Box trees around the edge of the developed area and introduced grasses and weeds.

The routes proposed for the effluent pipeline are primarily located in road reserves. A majority of the southern pipeline route (from the STP to the EMAI/Camden Park Estate) occurs within road reserves comprising either cleared areas with exotic grasses and herbaceous weeds or native and exotic landscape plantings with little conservation value.

A majority of the northern pipeline route (from the STP to the University of Sydney farm at Brownlow Hill) occurs within road reserves primarily devoid of native vegetation although a few pockets of regrowth woodland with occasional remnant trees in moderate condition exist in the area. Along the Brownlow Hill Loop Road two Cumberland Plain Woodland stands were recorded. Cumberland Plain Woodland is listed as an endangered ecological community under the *Threatened Species Conservation Act 1995*. The EIS concluded that the Project would require clearing a significant portion of roadside woodland and would significantly impact the roadside Cumberland Plain Woodland.

6.1.2 Key Issues Raised

There was concern that the EIS did not adequately assess the impacts to endangered ecological communities.

NSW Fisheries raised the issue of assessment of aquatic flora and fauna downstream of the STP including: the need for an eight part test for Macquarie Perch; the need for a macrophyte survey; and impacts to recreational and commercial fishing.

The Council of Camden raised concern about possible roadside work and the need for vegetation removal or trimming.

6.1.3 Consideration of Key Issues

SWC modified the Project by changing the effluent pipeline routes to avoid areas of significant vegetation. The Brownlow Hill Loop Road section of the northern pipeline route was removed to avoid the Cumberland Plain Woodland found along this stretch of road. The southern route had the small section of pipeline that ran through the EMAI property removed from the Project.

The Department notes that, with the effluent pipeline route modifications, no threatened species, populations and ecological communities would be affected by the Project. The Department also notes that the eight part test requested by NSW Fisheries for the Macquarie Perch concluded that there would be no significant impact.

To ensure that flora and fauna issues are effectively managed, the Department recommends that SWC prepare and implement a Flora and Fauna Management Sub Plan. This Plan would detail the characteristics and location of flora and fauna communities (including aquatic communities) in the vicinity of the Project, procedures for clearance of vegetation, strategies for minimising vegetation clearance and protection of vegetation, rehabilitation strategies, weed management plan, a maintenance program and a program for reporting on the effectiveness of management measures. This requirement is reflected in recommended Condition of Approval No 23.

The project final design may vary the location of treatment process elements. To ensure that remnant vegetation on the STP site is not affected the Department recommends Condition of Approval No 25 which requires that no trees be removed and that a buffer be maintained between the remnant vegetation and the Project. Recommended Condition of Approval No 24 states the procedures to be followed should SWC become aware of threatened species within the Project not identified and assessed in the EIS or representations Report.

6.2 Air Quality

6.2.1 Background

Upgrading the STP and constructing the effluent pipeline involves excavation with associated dust generation potential.

Odour modelling undertaken for the EIS indicates the upgraded STP would have a similarly occurring level of odour emission to the existing STP although the area of predicted odour impact moves approximately 100 metres to the north. This is a result of new facilities to the north of the existing STP facilities.

6.2.2 Key Issues

The Council of Camden expressed concern about the odour impact of the Project and has sought assurances that the facility can be amplified as proposed and still contain odours within the existing buffer zone.

6.2.3 Consideration of Key Issues

The Project has the potential to influence local air quality in two ways: dust generation during construction and odour emissions from the STP during operation.

The Department recommends the inclusion of Conditions of Approval Nos 45 to 47 to manage air quality during construction. These Conditions include a requirement to prepare a detailed Dust Management Sub Plan.

The Department and Council of Camden had similar concerns about the odour impact of the amplified STP. SWC provided the Department with two updated odour modelling reports for the STP in response

to these concerns. The updated modelling was for possible changes to the STP layout and demonstrated reduced impacts.

The Department is concerned that the actual odour impacts of the Project are dependent upon the STP's final design. To ensure that odour impacts are considered during detailed design the Department recommends Condition of Approval No 48. This requires submission of an Odour Management Plan to the Director General before construction commences. The Plan must be prepared in consultation with the DEC and Council of Camden and present the results of modelling odours from the final STP design.

6.3 Noise

6.3.1 Background

An assessment of the noise impacts of the Project's construction and operation was undertaken. Steps in the assessment were:

- measurement of the existing noise environment;
- establishment of the Project's construction and operation noise assessment goals;
- prediction and assessment of noise from construction and operation activities; and
- identification of methods to mitigate construction noise levels.

The EIS indicates that pipeline construction activities would generate noise levels at nearby residences exceeding the construction noise goals although the duration of noise at any one house would be relatively short and restricted to daytime hours only. It also indicated that operation of the upgraded and amplified STP would be within DEC noise criteria.

6.3.2 Key Issues

The Department and Council of Camden questioned the adequacy of the noise assessment and the predicted noise level of 85dB(A) for daytime pipeline construction.

6.3.3 Consideration of Key Issues

Exceedance of construction noise criteria is likely during pipeline construction due to the proximity of residences to work areas. To manage construction noise and vibration impacts the Department recommends Conditions of Approval Nos 29 to 35. These include:

- preparation of a detailed Construction Noise and Vibration Management Sub Plan;
- definition of construction noise and vibration objectives;
- restrictions on construction hours, including limits on noisy construction activities such as rock breaking; and
- a requirement that residents be notified of construction activities likely to affect their amenity.

The Department's recommended Condition of Approval No 36 requires that SWC monitor operation noise to verify that noise levels are within the amenity criteria specified in the EIS. Should monitoring indicate a clear trend in noise levels inconsistent with the predictions made in the EIS, SWC must implement further noise mitigation measures.

6.4 Traffic and Transport

Construction activities at the STP site and along the proposed effluent pipeline routes and the operation of the upgraded STP are not expected to result in a significant increase in local traffic volumes in the surrounding areas. The main potential for impact is during pipeline construction when partial road closures my be required.

The Council of Camden requested that SWC prepare and submit a Traffic Control Plan/Management Plan to council prior to the commencement of works.

To ensure that traffic impacts on local roads and the community are minimised, the Department recommends:

- Condition of Approval No 57 requiring the preparation of a Construction Traffic Management Sub Plan including a requirement to consult with Camden and Wollondilly Councils;
- Condition of Approval No 56 requiring that road dilapidation reports be prepared to monitor construction traffic effects on public roads. Where damage has occurred SWC is required to repair the damage at its cost; and
- Condition of Approval No 55 requiring that SWC maintain access to properties during construction.

6.5 Indigenous Heritage

The EIS Indigenous Heritage Study found that:

- most of the pipeline route has been highly modified;
- archaeological visibility along the pipeline route and within the STP site is poor due to the surface being obscured with dense grass cover and road base;
- one Aboriginal relic, an isolated stone artefact was found within the STP site;
- four archaeologically sensitive areas were found to be located adjacent to proposed work sites; and
- the area along Navigation Creek was assessed as the most sensitive area along the proposed pipeline route.

The Department questioned the potential impact on indigenous heritage and specifically requested information on the results of consultation with the local Aboriginal land council (LALC) and the effect of the southern pipeline route on two scarred trees.

The Representations Report provided clarification of heritage impacts and consultation with the LALC. The Representations Report states that the Tharawal LALC attended a site inspection on 30 April 2001 and subsequent correspondence from the LALC recommended that "No archaeological restrictions apply to the construction of the sewer re-use line along the proposed route".

The Representations Report advised that the two scarred trees are within the Camden Park Estate. The modified southern route ends at the boundary of the EMAI and does not enter the Camden Park Estate.

Recommended Conditions of Approval Nos 26 and 27 specify management requirements for indigenous heritage.

6.6 Non-Indigenous Heritage

The EIS Non-Indigenous Heritage Study found that:

- there are no heritage sites in the vicinity of the STP; and
- the southern pipeline route passes alongside the boundaries of a number of heritage items and/or properties with the most significant being Camden Park Estate and Brownlow Hill Homestead which are on the State Heritage Register.

The EIS states that although the heritage value of buildings and individual sites would not be disturbed by the proposed pipeline route construction, further liaison would be required once the preferred route is selected. Recommended Condition of Approval No 28 specifies management requirements for non-indigenous heritage.

6.7 Soils and Water Management

Soils in the Camden area are associated with the Blacktown Soils Landscape. The topography of the STP site is moderately sloping. The proposed southern pipeline route to the EMAI traverses relatively flat topography with some sections passing through floodplain area. The topography along the proposed northern pipeline route to the University of Sydney farm consists of gently undulating hills.

The EIS states that it is unlikely that any contaminated soils are present within the STP site. Acid Sulphate Soils have not been identified in the Camden area.

The Department generally endorses SWC's proposed safeguards to minimise the risk of soil erosion and contamination during construction. Before commencing construction, SWC would be required to prepare a Soil and Water Quality Management Sub Plan. This Plan is required by recommended Condition of Approval No 37.

To avoid the need to dispose of excavated material to landfill recommended Condition of Approval No 44 requires that SWC re-use or recycle excavated materials.

6.8 Visual Impact and Landscape Design

The STP and proposed pipeline routes are located in a rural environment although there are nearby urban areas including Camden. The STP is moderately screened from outside views by scattered vegetation, remnant trees and surrounding levee banks. The proposed effluent pipeline routes would be laid mainly along road verges with the topography ranging from alluvial flats to low hills of cleared agricultural land. Scattered trees and shrubs are found along the road verges, especially along the proposed northern route.

The potential visual impacts during construction of the STP and effluent pipeline relate to increased vehicle movements, construction machinery, presence of temporary structures and the excavation of soil material. The construction activity within the STP site would be confined to the already disturbed areas and would be screened partially from Sheathers Lane and adjacent properties by existing vegetation. Visual impacts from the construction of the effluent pipeline would be temporary.

The Department recommends Condition of Approval No 58 which requires SWC to prepare a Landscape Design Report which would address the Project's landscaping and built elements.

Recommended Condition of Approval No 59 requires that all landscaping or rehabilitation works be maintained for three years following construction.

6.9 Hazards and Risks

The EIS indicates that no classified dangerous goods are proposed for use during the upgrade construction work. The EIS indicates that potential risks associated with the STP operations are posed by:

- lack of emergency planning;
- lack of fire safety;
- spills of corrosives;
- aircraft crash; and
- earthquake.

No representations relating to hazard and risk issues were received although the Department requested a copy of the Preliminary Hazard Analysis (PHA) cited in the EIS. The PHA concluded that the upgrade of the West Camden STP is considered a potentially hazardous industry (or process) due to the quantity of Dangerous Goods Class 8 stored on site. Subsequently, preliminary hazard identification was undertaken and concluded:

- a traffic route evaluation study is not required because the number of vehicle movements per week and year are below the transportation screening threshold; and
- that the STP is not considered a potentially offensive industry because of the controls for odour, solid process outputs and nutrient levels.

Recommended Condition of Approval No 60 requires that SWC prepare a Hazards and Risk Management Sub Plans for both construction and operation.

6.10 Administrative, Environmental Management and Miscellaneous Conditions

The Department recommends a series of other Conditions of Approval as follows:

- Conditions of Approval Nos 1 to 11. These cover administrative, compliance and auditing requirements;
- Conditions of Approval Nos 12 to 17. These require preparation of construction and operation environmental management plans and specify the requirements for an Environmental Management Representative;
- Conditions of Approval Nos 18 to 22. These cover broad communication and consultation with the community including advertising the construction activities and establishing a complaints management system;
- Condition of Approval No 50 which requires that SWC adopt energy efficient work practices;
- Conditions of Approval Nos 51 to 54. These cover the management of property damage;
- Condition of Approval No 61 which requires that SWC prepare waste management and re-use plans for construction and operation;
- Condition of Approval No 62 which requires that SWC manage alterations to utilities and services; and
- Condition of Approval No 63 which presents location criteria for ancillary facilities such as construction compounds.

7. CONCLUSION AND RECOMMENDATIONS

SWC proposes to upgrade and amplify the existing West Camden Sewage Treatment Plant (STP) and construct an effluent transfer pipeline to supply treated effluent to nearby customers. The Project was developed to upgrade the STP's treatment processes, reduce nutrient discharges to the Hawkesbury Nepean River, amplify the STP's capacity to cater for population growth and provide opportunities for effluent re-use. An advanced tertiary sewage treatment level is proposed which would produce effluent of suitable quality for both river discharge and also agricultural irrigation.

Ten representations were received in response to the public exhibition of the EIS. Five were received from State Government, two from local government, two from catchment management groups and one from a local interest group. No representations were received from private individuals. Five representations indicated qualified support for the Project. No clear objections to the overall Project were received. Issues raised in representations included:

- implementation of the effluent re-use scheme;
- environmental flows;
- effluent quality;
- replacement of river water extraction with effluent supply; and
- flooding.

The Department believes that the proposal would provide significant benefits compared to doing nothing and is the best option of the alternatives considered. The Department recognises that the Project is required to service urban growth from existing and new release areas. Ensuring the implementation of an effluent re-use scheme and attaining a high quality effluent are essential in reducing the pollutant loads in the river and the impacts on river health.

The Project is also closely aligned with other Government initiatives for the Hawkesbury Nepean River including the Statement of Joint Intent (SOJI) and Hawkesbury Nepean River Management Forum. It would enable SWC some flexibility to implement outcomes of initiatives involving both river extraction and environmental flows.

The Department has undertaken an assessment of the likely environmental impacts of the Project. In particular, it considered key issues associated with water quality, the implementation of an effluent re-use scheme, environmental flows and river extraction, and hydrology and flooding. Other issues examined were flora and fauna, air quality, noise, traffic and transport, heritage, soil and water management, visual impact and landscape design and hazards and risks. The Department's review concluded that, provided comprehensive mitigation measures were implemented, the adverse impacts of the Project could be reduced to an acceptable level.

The Department recommends that SWC prepare comprehensive environmental management plans for the construction and operation stages of the Project. The Plans are to describe how the mitigation measures contained in the EIS, Representations Report and the recommended Conditions of Approval are to be practically implemented.

The Department's assessment concludes that, provided the recommended Conditions of Approval are adopted, the Project could be approved by the Minister.

8. RECOMMENDED CONDITIONS OF APPROVAL

This Section provides the Department's recommended Conditions of Approval for the Project under section 115B(2) of the EP&A Act. The recommended conditions were developed from the Department's assessment of the EIS, the Representations made to the EIS, the Proponent's Representations Report and any further supplementary investigations, studies or advice.

Table of Contents – Recommended Conditions of Approval

DEFINITIONS

Activity	The Activity described in Schedule 1 of this Approval
Approved Activity Area	The footprint of the Activity covered by the Conditions of Approval
Conditions of Approval (the Conditions)	The Minister's Conditions of Approval for the Activity
Construction	Includes all work in respect of the Activity **other** than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing site compounds (in locations meeting the criteria of these Conditions), or other activities certified by the EMR to have minimal environmental impact (e.g. minor access roads, minor adjustments to services/utilities, etc.)
Department, the	Department of Infrastructure, Planning and Natural Resources
Definition of times	Daytime is 7am to 6pm Monday to Saturday, and 8am to 6pm Sundays and Public Holidays Evening is 6pm to 10pm Night-time is 10pm to 7am Monday to Saturday, and 10pm to 8am Sundays and Public Holidays
Directly Affected Landowner	Property owner identified in any of the EIS, Representations Report or CEMP to require a mitigation measure to ameliorate an identified impact to their property
Director General, the	Director General of the Department (or delegate)
Director General's Agreement	A written advice from the Director General (or delegate)
Director General's Approval	A written approval from the Director General (or delegate) Where the Director General's approval is required under any Minister's Condition the Director General will endeavour to provide a response within one month of receiving an approval request. The Director General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
Director General' s Report	The report provided to the Minister by the Director General of the Department under section 115C of the EP&A Act
Dry weather	As defined in the POEO Act Licence for West Camden STP
Effluent	Treated sewage from the West Camden STP

EIS	West Camden Sewage Treatment Plant Upgrade and Amplification Environmental Impact Statement prepared by AWT ES&T Pty Ltd for Sydney Water Corporation , dated 14 November 2001
Minister, the	Minister for Infrastructure and Planning
Operation	Means the Operation of the Activity but **does not** include commissioning trials of equipment or temporary use of parts of the Activity during Construction
POEO Act Licence	The Environment Protection Licence for the West Camden Sewage Treatment System including the STP at the corner of Sheathers and Ferguson Lanes, Grasmere NSW 2570
Proponent	Sydney Water Corporation
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre)
Reasonable and feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW/Australian context. **Feasible** relates to engineering considerations and what is practical to build. **Reasonable** relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements
Relevant Councils	Council of Camden and Wollondilly Shire Council
Relevant Government Departments	A government authority with a licensing or approval role for the Activity's construction or operation. Generally one or more of NSW Agriculture, the DEC, NSW Fisheries, the Heritage Office, the Department and the NPWS
Representations Report	West Camden Sewage Treatment Plant Upgrade and Amplification Representations Report prepared by the Sydney Water Corporation, dated December 2002
River	Has the meaning given under the *Water Management Act 2002*. In summary this is "any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved". A detailed description of river or waterway types is available in the classification provided in the *Policy and Guidelines for Bridges, Roads, Causeways, Culverts and Similar Structures* (NSW Fisheries 1999)
Sensitive Receiver	Residence, education institution (e.g. school, TAFE college), health care facility (e.g. nursing home, hospital) and religious facility (e.g. church)
Structure	Any fixed artificial object including residences, farm sheds, fences, dams, cable support structures, etc.

ABBREVIATIONS

ADWF	average dry weather flow
ARI	average recurrence interval
ASS	acid sulfate soils
BOD	biochemical oxygen demand
CLG	community liaison group(s)
CMS	construction method statements
CEMP	construction environmental management plan
dB(A)	Decibel, "A" weighted scale
DEC	Department of Environment and Conservation
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Representative
EPA	Environment Protection Authority (now part of the DEC)
EP&A Act	*Environmental Planning and Assessment Act 1979*
L_{A90}	The noise level exceeded for 90% of a monitoring period, also referred to as the background noise level
$L_{Aeq\ (9hour)}$	Equivalent continuous (constant) sound pressure level over a 9 hour period from 10pm to 7am
$L_{Aeq\ (15\ hour)}$	Equivalent continuous (constant) sound pressure level over a 15 hour period from 7am to 10pm
$L_{Aeq\ (15\ mins)}$	Equivalent sound pressure level over a 15 minute interval
$L_{A1(1\ minute)}$	Sound pressure level exceeded for 1 per cent of the time measured over a 1 minute interval
$L_{A10\ (15\ mins)}$	Sound pressure level exceeded for 10 per cent of the time over a 15 minute period
mg/L	milligrams per litre
ML/day	Megalitres a day
NFR	non-filterable residue
OEMP	operation environmental management plan
PAD	potential archaeological deposit
POEO Act	*Protection of the Environment Operations Act 1997*
STP	sewage treatment plant

ADMINISTRATIVE CONDITIONS

General

1. The Activity must be carried out consistent with the:

   (a) the procedures, safeguards and mitigation measures identified in the EIS, as modified by the Representations Report; and
   (b) these Conditions.

   These Conditions prevail in the event of any inconsistency with the requirements for the Construction and Operation of the Activity arising out of the documents described in (a) above.

2. These Conditions do not relieve the Proponent of the obligation to obtain all other approvals and licences required under any other Act. The Proponent must comply with the terms and conditions of such approvals and licences.

Compliance

General

3. The Proponent must notify in writing the Director General, Relevant Government Departments and Relevant Councils of the start of the Activity's Construction and Operation. Such notification must be provided at least four weeks before the relevant start date unless otherwise agreed to by the Director General.

4. It is the responsibility of the Proponent to ensure compliance with all of these Conditions and to implement any measures arising from these Conditions.

5. The Proponent must comply with any requirements of the Director General arising from the Department's assessment of:

   (a) any reports, plans or correspondence that are submitted to satisfy these Conditions of Approval; and
   (b) the implementation of any actions or measures contained in these reports, plans or correspondence.

Staging Report

6. The Proponent may elect to construct the Activity in discrete work packages or defined stages provided that such stages or work packages are consistent with these Conditions of Approval. Where discrete work packages or defined stages are proposed, the Proponent must submit a Staging Report to the Director General at least four weeks before Construction commences (or within any other time agreed to by the Director General). The Staging Report must:

   (a) describe the work packages or defined stages; and
   (b) identify how the Conditions will be addressed in each work package or defined stage.

Pre-Construction Compliance Report

7. The Proponent must submit a *Pre-Construction Compliance Report* to the Director General at least four weeks before Construction commences (or within any other time agreed to by the Director General).

   The *Pre-Construction Compliance Report* must include:

   (a) details of how the Conditions of Approval required to be addressed before Construction were responded to;
   (b) the time when each relevant Condition of Approval was complied with including dates of submission of any required reports and/or approval dates; and
   (c) details of any approvals or licences required to be issued by Relevant Government Departments before Construction commences.

Pre-Operation Compliance Report

8. The Proponent must submit a *Pre-Operation Compliance Report* to the Director General at least four weeks before Operation commences (or within any other time agreed to by the Director General).

   The *Pre-Operation Compliance Report* must include:

   (a) details of how the Conditions of Approval required to be addressed before Operation were responded to;
   (b) the time when each relevant Condition of Approval was complied with including dates of submissions of any required reports and/or approval dates; and
   (c) details of any approvals or licences issued by Relevant Government Departments for the Activity's Operation.

Construction Compliance Reports

9. The Proponent must provide the Director General, Relevant Councils and any other Government department nominated by the Director General with *Construction Compliance Reports*. The EMR must review the *Construction Compliance Reports* before they are submitted to the Director General and bring to the Director General's attention any errors or qualifications.

   The first *Construction Compliance Report* must be submitted a maximum six months after Construction commences and subsequent reports at maximum intervals of six months (or at any other time interval agreed to by the Director General) for the duration of Construction. The first *Construction Compliance Report* must cover at least the first five months of Construction.

   The *Construction Compliance Reports* must include information on:

   (a) compliance with the CEMP and the Conditions of Approval;
   (b) compliance with any approvals or licences issued by Relevant Government Departments for the Construction phase;
   (c) the implementation and effectiveness of environmental controls. The assessment of effectiveness should be based on a comparison of actual impacts against identified performance criteria;
   (d) environmental monitoring results presented as a results summary and analysis;

(e) the number and details of any complaints, including a summary of main areas of complaint, action taken, response given and intended strategies to reduce complaints of a similar nature;
(f) details of any review and amendments to the CEMP resulting from Construction during the six months; and
(g) any other matter relating to the compliance with the Conditions of Approval or as requested by the Director General.

The *Construction Compliance Reports* must also be made Publicly Available.

Environmental Impact Audits

Environmental Impact Audit Report - Construction

10. An *Environmental Impact Audit Report - Construction* must be prepared and submitted to the Director General a maximum three months after the Activity begins Operation. The *Environmental Impact Audit Report - Construction* must also be submitted to other Government departments upon the request of the Director General.

The *Environmental Impact Audit Report - Construction* must:

(a) identify the major environmental controls used during Construction and assess their effectiveness;
(b) summarise the main environmental management plans and processes implemented during Construction and assess their effectiveness;
(c) identify any innovations in Construction methodology used to improve environmental management; and
(d) discuss the lessons learnt during Construction, including recommendations for future Activities.

Environmental Impact Audit Report - Operation

11. An *Environmental Impact Audit Report - Operation* must be submitted to the Director General a maximum 24 months after the Activity begins Operation and at any additional periods that the Director General may require. The *Environmental Impact Audit Report - Operation* must also be submitted to other Government departments upon the request of the Director General.

The *Environmental Impact Audit Report - Operation* must:

(a) be certified by an independent person at the Proponent's expense. The certifier must be advised to the Director General before the *Environmental Impact Audit Report – Operation* is prepared;
(b) compare the Operation impact predictions made in the EIS, Representations Report and any supplementary studies with the actual impacts;
(c) assess the effectiveness of implemented mitigation measures and safeguards;
(d) assess compliance with the systems for operational maintenance and monitoring;
(e) discuss the results of consultation with the local community particularly any feedback or complaints; and
(f) be made Publicly Available.

ENVIRONMENTAL MANAGEMENT

Construction Environmental Management

Environmental Management Plan

12. A Construction Environmental Management Plan (CEMP) must be prepared in accordance with the Conditions of Approval, all relevant Acts and Regulations and accepted best practice management procedures. The Proponent must obtain the Director General's approval for the CEMP before Construction commences or within any other time agreed to by the Director General. The CEMP must be certified by the EMR to comply with the Conditions of Approval before the Proponent seeks the Director General's approval for the CEMP.

    The Proponent must ensure that the mitigation measures identified in the EIS, Representations Report and in these Conditions are incorporated into the CEMP.

    The CEMP must:

    (a) identify the Construction activities associated with the Activity including Construction sites and the staging and timing of proposed works;
    (b) cover any other relevant environmental elements identified by the Proponent, or its contractor, from their environmental due diligence investigations;
    (c) contain the Construction Sub Plans required by the Conditions of Approval;
    (d) be prepared following consultation with Relevant Government Departments and Relevant Councils;
    (e) be Publicly Available;
    (f) include a community consultation and notification strategy (including local community, Relevant Government Departments, Relevant Councils), and complaint handling procedures;
    (g) include environmental management details such as:
        i identification of the statutory obligations which the Proponent is required to fulfil during Construction, including all approvals and licences;
        ii an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the CEMP;
        iii the role of the EMR;
        iv details of the Construction personnel induction and training program;
        v emergency response procedures;
    (h) include implementation details such as:
        i identification of relevant environmental elements;
        ii measures to avoid and/or control environmental impacts;
        iii the tools to be used to implement the CEMP such as plans, schedules and work instructions;
    (i) include monitoring and review details such as:
        i performance monitoring plans for all measurable environmental elements;
        ii auditing and corrective actions procedures;
        iii CEMP review procedures.

Operation Environmental Management

Operation Environmental Management Plan

13. An Operation Environmental Management Plan (OEMP) must be prepared in accordance with the Conditions of Approval, all relevant Acts and Regulations and accepted best practice management procedures. The Proponent must obtain the Director General's approval for the OEMP before Operation commences or within any other time agreed to by the Director General. The OEMP must be certified by the EMR to comply with the Conditions of Approval before the Proponent seeks the Director General's approval for the OEMP.

    The OEMP must:

    (a) identify the Operation activities;
    (b) include the Operation Sub Plans required under these Conditions of Approval;
    (c) be prepared in consultation with Relevant Government Departments and Relevant Councils;
    (d) cover any relevant environmental elements identified by the Proponent either from its environmental due diligence investigations or required to satisfy any other licence or approval;
    (e) be made Publicly Available;
    (f) include environmental management details such as:
        i identification of statutory obligations which the Proponent is required to fulfil during Operation, including all approvals and licences;
        ii an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the OEMP;
        iii details of a personnel induction and training program;
        iv emergency response procedures;
    (g) include implementation details such as:
        i identification of relevant environmental elements;
        ii measures to avoid and/or control environmental impacts;
        iii the tools to be used to implement the OEMP such as plans, schedules and work instructions;
    (h) include monitoring and review details such as:
        i performance monitoring plans for all environmental elements;
        ii auditing and corrective actions procedures;
        iii OEMP review procedures.

    If the Proponent has an Operation Environmental Management Plan (or similar system) for its other activities which is applicable to this Activity then that system may be proposed as the Activity OEMP. Details of the existing system must be provided to the Director General demonstrating its application to this Activity.

Environmental Management Representative

14. The Proponent must request the Director General's approval for the appointment of an Environmental Management Representative (EMR) at least three months before Construction commences (or within any other time agreed to by the Director General). In its request the Proponent must provide the following information, the:

(a) qualifications and experience of the EMR including demonstration of capability to undertake environmental auditing;
(b) role and responsibility of the EMR;
(c) authority and independence (from the Proponent or its contractors) of the EMR including details of the Proponent's internal reporting structure; and
(d) resourcing of the EMR role. The EMR must be available:

    i for sufficient time to undertake the EMR role This timing shall be agreed between the Proponent and the EMR and advised to the Department in the request for approval;
    ii at any other time requested by the Department; and
    iii during any Construction activities identified in the CEMP to require the EMR's attendance.

15. The Director General may at anytime immediately revoke the approval of an EMR appointment by providing written notice to the Proponent. Interim arrangements for EMR responsibility following the cancellation notice must be agreed in writing between the Department and the Proponent.

16. The Department may at anytime conduct an audit of any actions undertaken by the EMR. The Proponent must:

(a) facilitate and assist the Department in any such audit; and
(b) include in the conditions of the EMR's appointment the need to facilitate and assist the Department in any such audit.

17. The EMR is authorised to:

(a) consider and advise the Department and the Proponent on matters specified in the Conditions of Approval and compliance with such;
(b) determine whether work falls within the definition of Construction where clarification is requested by the Proponent;
(c) certify the CEMP;
(d) certify the OEMP (if required);
(e) review the Proponent's induction and training program for Construction personnel and monitor its implementation;
(f) periodically monitor the Proponent's activities to evaluate compliance with the CEMP. Periodic monitoring must involve site inspections of active work sites at least fortnightly;
(g) provide a written report to the Proponent of non-compliance with the CEMP. Non-compliance must be managed as identified in the CEMP;
(h) direct the Proponent to stop work immediately if, in the view of the EMR, an unacceptable impact on the environment is occurring or is likely to occur. The EMR may also require that the Proponent initiate reasonable actions to avoid or minimise adverse impacts;
(i) review corrective and preventative actions to ensure the implementation of recommendations made from audits and site inspections;
(j) certify that minor revisions to the CEMP are consistent with the approved CEMP; and
(k) provide regular (as agreed with the Department) reports to the Department on matters relevant to the carrying out the EMR role including notifying the Director General of any stop work notices.

The EMR must immediately advise the Proponent and the Director General of any incidents relevant to these Conditions resulting from Construction that were not dealt with expediently or adequately by the Proponent.

COMMUNICATION AND CONSULTATION

Advertisement of Activities

18. Before Construction commences, and then at maximum three monthly intervals, the Proponent must advertise in relevant local newspapers the nature of the works proposed for the next three months, areas in which these works are proposed, Construction hours and a contact telephone number.

    The Proponent must ensure that the local community and businesses are advised (by means such as newsletters, leaflets, newspaper advertisements, community notice boards, etc.) of the Activity's progress. Information to be provided must include:

    (a) details of any traffic disruptions and controls;
    (b) construction of temporary detours; and
    (c) work approved to be undertaken outside the normal Construction hours, in particular noisy works, before such works are undertaken.

19. The Proponent must establish an Activity internet site before Construction commences and maintain the internet site for a minimum 12 months after Construction ends. This internet site must contain:

    (a) periodic updates of work progress, consultation activities and planned work schedules. The site must indicate the date of the last update and the frequency of the internet site updates;
    (b) a description of relevant approval authorities and their areas of responsibility;
    (c) a list of reports and plans that are Publicly Available under this Approval and details of how these can be accessed;
    (d) contact names and phone numbers of the Activity communications staff; and
    (e) the 24 hour toll-free complaints contact telephone number.

    Updates of work progress, Construction activities and planned work schedules must be provided where significant changes in noise or traffic impacts are expected.

Community Liaison Plan

20. As part of the CEMP the Proponent must prepare a community liaison plan for the Activity.

21. The Proponent must consult all Directly Affected Landowners regarding any reasonable and feasible measures to minimise impacts. Measures identified in the EIS or Representations Report (as relevant) and the CEMP must be implemented according to a program agreed between the Directly Affected Landowner and the Proponent.

Complaints Management System

22. The Proponent must implement a Complaints Management System before Construction commences. The System must include:

    (a) the name and contact details of the person(s) responsible for implementing and maintaining the Complaint Management System;
    (b) adequate resources including people, communication facilities, transport etc.;
    (c) a 24 hour, toll free telephone number listed with a telephone company and advertised. This telephone number must enable any member of the public to reach a person who can arrange a response to their complaint;
    (d) a system to receive, record, track and respond to complaints within the specified timeframe. When a complaint cannot be responded to immediately, a follow-up verbal response on what action is proposed must be provided to the complainant within two hours during any night-time works and 24 hours at other times;
    (e) a process for the provision of a written response to the complainant within 10 days, if the complaint cannot be resolved by the initial or follow-up verbal response; and
    (f) a mediation system for complaints that are unable to be resolved. Where external or independent mediation is required, the mediator must be approved by the Director General.

    Information on all complaints received, including the means by which they were addressed and whether resolution was reached with or without mediation, must be included in the Construction Compliance Reports and must be made available to the Director General on request.

FLORA AND FAUNA

Construction

23. As part of the CEMP, the Proponent must prepare a Flora and Fauna Management Sub Plan in consultation with Relevant Government Departments and Relevant Councils. The Sub Plan must include:

    (a) methods to reduce and manage impacts on flora and fauna (terrestrial and aquatic) and their habitat which may be directly or indirectly affected by the Activity;
    (b) performance goals against which to measure the success of the methods;
    (c) ecological details including:
        i plans showing: vegetation communities highlighting important fauna habitat areas and threatened species locations; areas to be cleared; and a clearing program. The plan must cover the Approved Activity Area and extend to vegetation in adjoining areas where this is both contiguous with the Approved Activity Area and contains important fauna habitat areas and/or threatened species;
        ii procedures for vegetation clearing and soil management during Construction;
        iii strategies for minimising vegetation clearance within the Approved Activity Area and protection of vegetated areas outside that area;
        iv a habitat tree management program including fauna recovery procedures, potential for relocation of hollow bearing trees, compensatory management measures (such as replacement of lost hollows with nesting boxes);

v where possible, strategies for re-using individuals or populations of any threatened plant species that would otherwise be destroyed by the Activity in rehabilitation works;

(d) rehabilitation details including:
   i identification of the locally native species to be used in rehabilitation and landscaping works, including flora species suitable as a food resource for threatened fauna species;
   ii the source of all seed or tubestock to be used in rehabilitation and landscaping works including the identification of seed sources within the Approved Activity Area. Seed of locally native species within the Approved Activity Area should be collected before Construction commences to provide seed stock for revegetation;
   iii methods to re-use topsoil and cleared vegetation;
   iv methods to ensure topsoils, and where relevant subsoils, are stripped, stored and placed back in their original sequence;
   v measures to re-use surplus vegetation such as donation to community groups or distribution to the local community;
   vi a program for the active management and maintenance of all preserved, planted and rehabilitated vegetation (including aquatic vegetation) including watering regimes, fencing, replacement of vegetation that may have died and weed management;
(e) a Weed Management Plan including:
   i weed identification;
   ii weed eradication methods and protocols for the use of herbicides;
   iii methods to treat and re-use weed infested topsoil;
(f) a program for reporting on the effectiveness of terrestrial and aquatic flora and fauna management measures against performance goals. Management methods must be reviewed where found to be ineffective.

24. If during the course of Construction, the Proponent becomes aware of the presence of threatened species not identified and assessed in the EIS or Representations Report and which are likely to be affected, the Proponent must:

(a) immediately cease all work likely to affect the threatened species;
(b) inform the Director General of the DEC and/or Director of NSW Fisheries as relevant; and
(c) not recommence work likely to affect the threatened species until receiving advice from the DEC and/or NSW Fisheries to do so.

25. No remnant trees within the STP site must be removed for the Activity. A buffer zone of no less than ten metres must be established between the Cumberland Plain Woodland area, situated in the northern section of the site, and the Activity.

HERITAGE

Indigenous Heritage Management Sub Plan

26. The CEMP must include:

(a) procedures to be implemented if previously unidentified Indigenous objects are discovered during Construction; and

(b) a site induction program for all personal on their obligations for Indigenous cultural materials.

27. Works within the STP boundary must be confined to the Approved Activity Area.

Non-Indigenous Heritage Management Sub Plan

28. The CEMP must include:

(a) procedures to be implemented if previously unidentified historical relics are discovered during Construction; and
(b) a site induction program for all personnel on their obligations for historic relics.

NOISE AND VIBRATION

Construction Noise and Vibration Management Sub Plan

29. The Proponent must prepare a detailed Construction Noise and Vibration Management Sub Plan as part of the CEMP. The Sub Plan must be prepared in consultation with the Relevant Councils and the DEC and must include:

(a) identification of each work area, site compound and Construction depot;
(b) identification of the specific activities that will be carried out and associated noise sources for each work area, site compound and Construction depot;
(c) identification of all potentially affected noise sensitive receivers;
(d) the Construction noise objective specified in the Conditions of Approval;
(e) the Construction vibration criteria specified in the Conditions of Approval;
(f) determination of appropriate noise and vibration objectives for each identified noise sensitive receiver;
(g) noise and vibration monitoring, reporting and response procedures;
(h) assessment of potential noise and vibration from the proposed Construction methods including noise from Construction vehicles and any traffic diversions;
(i) analysis of feasible noise mitigation measures such as:
    i maximising the separation distance between noisy plant items and sensitive receivers;
    ii Construction timetabling, in particular for works outside standard hours, to minimise noise impacts. This may include time and duration restrictions and respite periods;
    iii avoiding using noisy plant simultaneously and/or close together, adjacent to sensitive receivers;
    iv orienting equipment away from sensitive receivers;
    v carrying out loading and unloading away from sensitive receivers;
    vi use of dampened tips on rock breakers;
    vii use of portable enclosures around mobile and fixed plant where noise impacts are likely to be unacceptable;
    viii using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks;
    ix selection of plant and equipment based on noise emission levels;
    x use of alternative Construction methods;

xi alternative arrangements with directly affected landowners or residents of such properties) such as temporary relocation;
xii selecting site access points and roads as far as possible away from sensitive receivers; and
xiii use of spotters, Closed Circuit Television Monitors and 'smart' reversing alarms in place of traditional reversing alarms.

(j) a description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during Construction;
(k) justification for any activities outside the Construction hours specified in the Conditions of Approval. This includes identifying areas where Construction noise would not be audible at any sensitive receiver;
(l) internal noise audit systems including recording of daily hours of Construction, progressive impact assessments as the work proceeds and site inspections by the EMR;
(m) procedures for notifying residents of Construction activities that are likely to affect their noise and vibration amenity;
(n) contingency plans to be implemented in the event of non-compliances and/or noise complaints; and
(o) education of Construction personnel about noise minimisation.

Construction Hours

30. Construction activity must be restricted to between the hours of 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays.

Works may be undertaken outside these hours where:

(a) the delivery of materials is required outside these hours by the Police or other authorities for safety reasons;
(b) it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or
(c) the work is identified in the Construction Noise and Vibration Management Sub Plan and approved as part of the CEMP. This includes the identification of Construction areas where work could be undertaken that would be inaudible at sensitive receivers.

Local residents should be informed of the timing and duration of work approved under item (c) at least 48 hours prior to commencement of that work.

Construction Noise Objective

31. The Construction noise objective for the Activity is to manage noise from Construction activities (as measured by a $L_{A10\ (15minute)}$ descriptor) to not exceed the background L_{A90} noise level by:

(a) more than 20 dB(A) for construction of the recycled water pipeline (provided construction in the vicinity of any one residence is less than four weeks); and
(b) more than 5 dB(A) for works on the STP site.

Background noise levels are those identified in the EIS or Representations Report or otherwise identified in the Construction Noise and Vibration Management Sub Plan.

Any potential activities that may cause noise emissions that exceed the objective must be identified and managed in accordance with the Construction Noise and Vibration Management

Sub Plan. The Proponent must implement all feasible noise mitigation and management measures with the aim of achieving the Construction noise objective.

If the noise from a Construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the *NSW Industrial Noise Policy*), 5dB(A) must be added to the measured Construction noise level when comparing the measured noise with the Construction noise objective.

Construction Noise Management

32. The Proponent must ensure that public address systems used at any Construction site are not used outside the Construction hours detailed in the Conditions of Approval unless otherwise specified in the Construction Noise and Vibration Management Sub Plan. Public address systems must be designed to minimise noise spillage off-site (for example by using directional speakers, volume control with background noise adjustments, locating and pointing speakers away from sensitive receivers etc.).

33. The Proponent must schedule rock breaking, rock hammering, sheet piling, pile driving and any similar activity only between the following hours unless otherwise approved in the Construction Noise and Vibration Management Sub Plan:

    (a) 9 am to 12 pm and 2 pm to 5 pm Monday to Friday; and
    (b) 9 am to 12 pm, Saturday

34. The Proponent must consult with education institutions and minimise the impact of noise generating Construction works in their vicinity. The Proponent must ensure that Construction works audible at an institution are not timetabled during important events, such as examination periods, unless arrangements acceptable to the affected institutions are made at no cost to the affected institutions.

Vibration Criteria

35. Vibration caused by Construction and received at any residence or structure outside the Approved Activity Area must be limited to:

    (a) for structural damage vibration, be limited to German Standard DIN 4150 Part 3 *Structural Vibration in Buildings. Effects on Structures*; and
    (b) for human exposure to vibration be limited to, the evaluation criteria presented in British Standard BS 6472- *Guide to Evaluate Human Exposure to Vibration in Buildings* (1Hz to 80 Hz) for low probability of adverse comment.

    These limits apply unless otherwise approved in the Construction Noise and Vibration Management Sub Plan.

Operation Noise Management

Operational Noise Monitoring

36. The Proponent must monitor the STP's operating noise at maximum intervals of six months for a minimum 12 months after Operation commences. Should monitoring indicate noise levels

exceeding the amenity criteria specified in section 7.9.3 of the EIS the Proponent must implement further noise mitigation measures in consultation with the DEC.

PHYSICAL ISSUES

Soil and Water Quality Management Sub Plan

37. As part of the Construction EMP, the Proponent must prepare a Soil and Water Management Sub Plan in consultation with Relevant Government Departments and Relevant Councils. The Sub Plan must:

    (a) where relevant, be consistent with the Department of Housing's guideline *Managing Urban Stormwater - Soils and Construction*, the RTA's *Guidelines for the Control of Erosion and Sedimentation in Roadworks* and the Department's *Constructed Wetlands Manual;*
    (b) identify the Construction activities that could cause soil erosion or discharge sediment or water pollutants from the site;
    (c) describe the management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including a strategy to minimise the area of bare surfaces during Construction (such as progressive site rehabilitation);
    (d) describe the location and capacity of all erosion and sediment control measures;
    (e) identify the timing and conditions under which Construction stage controls will be decommissioned;
    (f) include contingency plans to be implemented for events such as fuel spills; and
    (g) identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated.

Effluent Discharge

38. A minimum effluent discharge to Matahil Creek of 8 ML/day (or the actual STP inflow where this is less than 8 ML/day) must be maintained after Operation commences. The Director General may reduce this minimum discharge requirement following consultation with the Proponent and the DEC.

39. Effluent discharged to Matahil Creek must attain the effluent quality targets nominated in Table 7-6 of the EIS and Table 5-1 of the Representations Report. The targets must be attained following Optimisation of the STP Process or within a maximum 18 months of Operation commencing whichever is shorter. These criteria are summarised in the **Effluent Quality Table.** The criterion unit for all parameters is milligrams per litre and testing protocols are as specified in the POEO Act Licence. Parameter limits specified in the **Effluent Quality Table** will be superseded where the POEO Act Licence specifies the same or lower concentration limits.

Effluent Quality Table

Parameter	50 Percentile concentration limit	90 Percentile concentration limit
BOD	5	10
NFR	5	10
Ammonia nitrogen (NH_3-N)	0.5	2
Total Nitrogen	7.5	10
Total Phosphorus	0.04	0.3

Recycled Water

40. The proposed transfer pipelines for recycled water must be constructed consistent with the routes shown on Figure 2-4 of the Representations Report.

41. The Proponent must provide an Effluent Re-use Report to the Director General by 31st July 2005 (or within any other time agreed to by the Director General) on the implementation of a re-use scheme for effluent from the West Camden STP. The Effluent Re-use Report must include details of the:

    (a) POEO Act Licence requirements;
    (b) sites to be used for effluent application and their approval status;
    (c) long-term availability and sustainability of the sites for effluent application. The sustainability analysis must include water balances and nutrient budgets;
    (d) quantity of effluent to be re-used;
    (e) monitoring requirements; and
    (f) amount of licensed extraction from the Hawkesbury-Nepean River replaced by the effluent supply.

    The Effluent Re-use Report must consider the:

    (g) Statement of Joint Intent for the Hawkesbury-Nepean River System;
    (h) outcomes of the Healthy Rivers Commission Inquiry into the Hawkesbury-Nepean River;
    (i) Integrated Effluent Management Strategy for Hawkesbury-Nepean STPs;
    (j) recommendations of the Hawkesbury-Nepean River Management Forum;
    (k) Water Management Plan for the Hawkesbury-Nepean River; and
    (l) the environmental issues and goals set out in relevant guidelines including EPA (1995) *Environmental Guidelines for Industry – The Utilisation of Treated Effluent by Irrigation* and the National Water Quality Management Strategy (2000) *Guidelines for Sewerage Systems – Use of Reclaimed Water*, or as updated.

Hydrology and Flooding

Inundation levels

42. The Activity must be designed to "not worsen" the existing flooding characteristics in Matahil Creek. "Not worsen" is defined as:

    (a) a maximum increase in inundation levels in Matahil Creek of 100 mm; and
    (b) a maximum increase in inundation time of one hour for any rainfall event.

43. The Proponent must endeavour to resolve amicably any dispute between itself and any landowner about alterations to flooding characteristics caused by the Activity. If the parties cannot reach a mutually satisfactory resolution then the dispute resolution requirements of the Conditions of Approval shall apply.

Spoil and Fill Management

44. All material excavated from the works must be re-used or recycled where suitable and cost-effective. The Proponent must ensure that the re-use of material generated from Construction activities is maximised in preference to importing fill.

Air Quality

Dust Management Sub Plan

45. A Dust Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must identify:

    (a) potential sources of dust;
    (b) dust management objectives consistent with EPA guidelines;
    (c) a monitoring program to assess compliance with the identified objectives;
    (d) mitigation measures to be implemented, including measures during weather conditions where high level dust episodes are probable (such as strong winds on hot, sunny days); and
    (e) a progressive rehabilitation strategy for exposed surfaces with the aim of minimising exposed surfaces.

Construction

46. Construction vehicles using public roads must be maintained to prevent any loss of load, whether in the form of dust, liquid or soils. Facilities (such as wheel washing equipment) must be provided at exit points of all Construction sites/compounds to minimise tracking mud, dirt or other material onto a public road or footpath. In the event of any spillage, the Proponent must remove the spilled material as soon as practicable within the working day of the spillage.

47. The Proponent must ensure that all plant and equipment used in connection with the Activity are:

    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

Odour Management

48. The Proponent must prepare an Odour Management Plan for the final design layout of the STP. The Odour Management Plan must:

    (a) be provided to the Director General before Construction commences (or within any other time agreed to by the Director General);
    (b) be prepared in consultation with the DEC and Camden Council;
    (c) identify all point and diffuse sources of odour at the STP and establish odour emission concentrations and rates from each source;
    (d) present the results of odour dispersion modelling for the STP operations. Odour dispersion modelling must be carried out in accordance with the EPA document *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (August 2001, or as amended); and
    (e) contain details of a monitoring program to be implemented to verify the modelling.

Overflow Management

49. The West Camden STP is to be designed and operated to ensure that there are a maximum 18 STP wet weather overflow events in 10 years. The method of calculating compliance with this criterion is as specified in the POEO Act Licence. This criterion will be superseded where the POEO Act Licence specifies the same or a lower number of STP wet weather overflow events in a 10 year period.

Greenhouse Gases

Construction Stage

50. The Proponent must promote the reduction of greenhouse gases by adopting energy efficient work practices including:

    (a) developing and implementing procedures to minimise energy waste;
    (b) conducting awareness programs as part of induction for all site personnel regarding energy conservation methods; and
    (c) conducting regular energy audits during the Activity to identify and address energy waste.

SOCIAL AND ECONOMIC ISSUES

Property Damage and Access

51. Subject to landowner agreement, building condition surveys must be conducted on all structures within:

    (a) 200 metres of blasting; or
    (b) 50 metres of Construction activities that generate vibration impacts; or
    (c) any other locations identified by the EMR.

    Building condition surveys must be undertaken at least 30 days before Construction occurs within the distance limits described in this Condition.

    The owners of all properties for which building condition surveys are to be conducted must be advised at least 14 days before the survey of its scope and methodology and of the process for making a property damage claim. A copy of the survey must be given to each affected owner at least three weeks before Construction that could affect the property commences. A register of all properties surveyed must be maintained by the Proponent indicating whether the owner accepted or refused the survey offer. A copy of the register must be provided to the Director General upon request.

52. Building condition surveys need not be undertaken if a risk assessment indicates structures will not be affected. The risk assessment must be undertaken before Construction commences by geotechnical and construction engineering experts with appropriate registration on the National Professional Engineers Register.

53. The Proponent must consult on a regular basis with all Directly Affected Landowners regarding any practical and cost-effective measures to minimise impacts. Agreed measures must be

implemented according to a program agreed between the Directly Affected Landowner and the Proponent.

54. Any property damage caused by the Activity's Construction or Operation, direct or indirect (including vibration and groundwater changes) must be rectified at no cost to the owner(s).

Access to Properties

55. The Proponent must ensure that access to properties is maintained throughout Construction. The Proponent must ensure that any legal property access affected by the Activity is reinstated to an equivalent standard or that alternative arrangements are negotiated with the relevant landowner(s).

Traffic

56. Road dilapidation reports must be prepared for all roads likely to be used by Construction traffic before Construction commences and after Construction is complete. Copies of the reports must be provided to the Relevant Councils. Any damage resulting from Construction, aside from that resulting from normal wear and tear, must be repaired at the cost of the Proponent.

    Nothing in this Condition shall be taken as restricting the Proponent from negotiating an alternative arrangement for road damage with either the RTA or Relevant Councils.

57. The Proponent must prepare a Construction Traffic Management Sub Plan as part of the CEMP in consultation with Relevant Councils and the RTA. The Sub Plan must include:

    (a) identification of all public roads to be used by Construction traffic, in particular roads proposed for the transport of large quantities of Construction materials. The timing and duration of road usage must be stated;
    (b) management methods to ensure Construction traffic uses identified roads;
    (c) identification of all public roads which may be partially or completely closed during Construction. Consideration must be given to programming Construction works to minimise road closures during peak periods;
    (d) impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons);
    (e) temporary traffic arrangements including property access;
    (f) access to Construction sites including entry and exit locations and measures to prevent vehicles queuing on public roads;
    (g) a response plan for any Construction traffic incident; and
    (h) appropriate review and amendment mechanisms.

LANDSCAPE DESIGN

Pre-Construction Report

58. The Proponent must prepare a Landscape Design Report before Construction commences in consultation with the Relevant Councils. The Plan must present an integrated landscape design concept for the Activity, applying all design principles established in the EIS and Representation Report. The Proponent must provide the Landscape Design Report to the Director General before Construction commences or within any other time agreed to by the Director General. The Report must include the design treatments for the following:

(a) built elements including the sewage pumping station;
(b) landscape elements including proposed treatments, finishes and materials of exposed surfaces (including colour specifications and samples); and
(c) lighting.

The Report must also include the following information:

(d) graphics for key elements such as sections, sketches, perspective views etc.;
(e) a schedule of species to be used in landscaping. The derivation of the schedule must be explained including its relationship with the Activity's ecological studies;
(f) details of the timing and progressive implementation of landscape works considering related environmental controls such as erosion and sedimentation controls and drainage; and
(g) procedures and methods to monitor and maintain landscaped or rehabilitated areas.

Construction

59. All landscape or rehabilitation works must be monitored and maintained by a suitably qualified landscape specialist at the Proponent's expense for a period of three years following completion of any landscaping stage or as otherwise identified in the Landscape Design Report. The Proponent must implement any required remedial measures to maintain landscaping works to their design standard.

MISCELLANEOUS REQUIREMENTS

Hazards and Risk Management

60. As part of the Construction and Operation EMPs, the Proponent must prepare and implement a Hazards and Risk Management Sub Plan. These Sub Plans must include:

(a) details of the hazards and risks associated with the Activity; and
(b) pro-active and reactive mitigation measures including contingency plans to be implemented in the event an identified hazard occurs.

Waste Management and Recycling

61. As part of the Construction and Operation EMPs the Proponent must prepare Waste Management and Re-use Sub Plans. The Sub Plans must address the management of wastes in accordance with the NSW Government's Waste Reduction and Purchasing Policy. The Sub Plans must identify requirements for:

(a) the application of the waste minimisation hierarchy principles of avoid-reduce-re-use-recycle-dispose;
(b) waste handling and storage;
(c) disposal of wastes. Specific details must be provided for cleared vegetation, contaminated materials, glass, metals and plastics, hydrocarbons (lubricants and fuels) and sanitary wastes;
(d) any waste material that is unable to be re-used, re-processed or recycled must be disposed at a facility licensed by the DEC to receive that type of waste; and

(e) implementation of energy conservation best practice.

Utilities and Services

62. The Proponent must identify the utilities and services (hereafter "services") potentially affected by Construction to determine requirements for diversion, protection and/or support. Alterations to services must be determined by negotiation between the Proponent and the service providers. The Proponent in consultation with service providers must ensure that disruption to services resulting from the Activity are minimised and advised to customers.

Location of Construction Facilities

63. The sites for Construction compounds and ancillary sites, such as temporary concrete batching plants, must satisfy the following criteria unless otherwise identified in the CEMP:

(a) be located within the Approved Activity Area;
(b) have ready access to the local road network;
(c) be located to minimise the need for heavy vehicles to travel through residential areas;
(d) be sited on relatively level land;
(e) be separated from nearest residences by at least 200 m (or at least 250 m for a temporary concrete batching plant);
(f) not be within 100 m of, or drain directly to, SEPP 14 wetlands;
(g) not be located within 100 m of a river;
(h) be located above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented;
(i) have low conservation significance for flora, fauna or heritage and must not require any vegetation clearing beyond that already required for the Activity; and
(j) not affect the land use of adjacent properties.

The location of any Construction compounds and ancillary sites must be detailed in the CEMP and must include an analysis against the above criteria.