THE OAKS, OAKDALE AND BELIMBLA PARK SEWERAGE SCHEME – PROPOSED MODIFICATION – LOW PRESSURE SYSTEM AT BELIMBLA PARK

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

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FOREWORD

The then Minister for Urban Affairs and Planning approved the Sydney Water Corporation (SWC) proposal to construct The Oaks, Oakdale and Belimbla Park Sewerage Scheme project in July 2001.

The SWC has constructed the reticulation system at The Oaks and Oakdale and the connecting transfer main to the West Camden sewage treatment plant (STP). Residents in these two townships have been able to connect to the new service since August 2003. As a result of detailed design investigations, the SWC has determined to amend the reticulation system in the area of Belimbla Park from gravity to a low pressure sewerage system. The modification is anticipated by SWC to reduce connection costs for residents, reduce disturbance during construction and reduce construction costs. The scheme is similar to that currently being installed by SWC in some suburbs as part of the Northern Illawarra Towns scheme.

The Report's purpose is to review the Review of Environmental Factors, issues raised in representations to the Review of Environmental Factors public exhibition, further information provided by the Proponent and any other information identified by the Department concerning the proposal's potential environmental impacts. The Report documents this independent assessment of the modified proposal and concludes that the modified proposal's potential environmental impacts are reduced (when compared to the approved project) and adverse impacts can be mitigated to an acceptable level by adopting management measures identified in this Report.

On that basis, it is recommended that the Minister modify the approval, subject to the recommended revisions to the conditions of approval.

Jennifer Westacott
Director General

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GLOSSARY AND ABBREVIATIONS

Council	Wollondilly Shire Council
DEC	Department of Environment and Conservation (an amalgamation of the former Environment Protection Authority and sections of the National Parks and Wildlife Service)
Department, the	Department of Infrastructure, Planning and Natural Resources
Director General	Director General of the Department of Infrastructure, Planning and Natural Resources
EMP	Environmental Management Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
IPART	NSW Independent Pricing and Regulatory Tribunal
LPSS	Low pressure sewerage system
MCoA	Minister's Conditions of Approval
REF	Review of Environmental Factors
SOC Act	*State Owned Corporations Act 1989*
SPS	Sewage Pumping Station
SWC	Sydney Water Corporation
TSC Act	*Threatened Species Conservation Act 1995*
USA	United States of America

EXECUTIVE SUMMARY

The Proposal

The then Minister for Urban Affairs and Planning approved the Sydney Water Corporation (SWC) proposal to construct The Oaks, Oakdale and Belimbla Park Sewerage Scheme project in July 2001.

As a result of detailed design investigations, the Sydney Water Corporation has now decided to build a low pressure system instead of the approved gravity based system in the area of Belimbla Park. This system is considered by SWC to be easier to construct and less expensive than a conventional gravity system in Belimbla Park (estimated to cost some 25% less than a gravity system). The proposal constitutes a modification to the approved Project.

Review of Environmental Factors Exhibition and Approval Process

SWC as Proponent determined that the proposed modification would not significantly affect the environment and accordingly prepared a Review of Environmental Factors (REF). The REF for the proposed modification was publicly exhibited between 4 and 18 August 2003. SWC received 16 representations to the REF.

The modification is sought under Section 115BA(2) of the Act, which allows for the Proponent to request the Minister to modify an approval if the Proponent intends to modify the approved activity so that it will be inconsistent with the approval.

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 proposal.

Proposed Modifications

The proposed modification involves the installation of a low pressure sewerage system (LPSS) in Belimbla Park where previously a gravity sewerage system had been approved by the Minister. A LPSS operates under a pressurised system with a collection tank and grinder pump connected in each property served by a small diameter line from the pump system to a collection pipeline in the street.

Associated with the new LPSS is a redesign of the reticulation system where the majority of collection pipelines have now been moved into the streets and out of private property. The Belimbla Park LPSS would connect to the main transfer, on Burragorang Road. Associated with the LPSS is the installation of a chemical dosing facility to reduce the potential for odours.

Proposal Justification

The REF states that the low pressure system would meet the key project objectives as well as:

- reducing the cost of connection on average by about $2,000 - $3,000 per household;
- reducing the amount of ground disturbance during construction;
- reducing the ability for water infiltration into the system.

The proposed low pressure system in Belimbla Park is justified by SWC on the basis that it provides a cost effective and environmentally beneficial method of providing a reticulated sewerage service.

Environmental Impact Assessment

The REF concludes that the proposed low pressure sewerage system would have a reduced environmental impact during both construction and operation on the natural environment compared to a gravity based system as well as reducing costs of implementation for Sydney Water and costs of connection for householders (estimated by SWC to be on average approximately $2,000 – $3,000 less for each household). The key environmental issues raised in the 16 representations received during the REF exhibition relate to concerns about the reliability of the low pressure system compared to a preferred gravity based system, operational impacts at the household, flora and fauna and the chemical dosing facility.

LPSS vs Gravity

A number of representations suggested that the LPSS was untested and would require high levels of maintenance and that a gravity based system should be installed in Belimbla Park. It was also suggested that SWC was installing a LPSS to reduce its costs.

SWC has strongly argued that it believes a LPSS would not be inferior to a gravity based system and that similar systems have been installed and successfully operated in the USA for up to 30 years. A LPSS system has been constructed in Victoria and SWC is currently installing it in some suburbs as part of the Northern Illawarra Towns scheme. SWC stated that reduced costs of connection for most residents, reduced infiltration potential, as well as reduced costs of construction were key advantages of a LPSS. Large block sizes, sensitive environments and undulating topography as is the case in Belimbla Park would also favour the use of an LPSS system.

In principle, the Department has no objection to the provision of a LPSS for Belimbla Park. The SWC community surveys indicate that that the majority of residents will eventually connect to the LPSS including a number of those who signed petitions objecting to the scheme. Residents would benefit from lower connection costs than would be the case for a gravity based system.

Impacts at the Household

A number of representations raised concerns about the operational impacts of the system and its reliability. In particular, concerns raised included the ongoing electricity costs of operation, responsibility for maintenance and monitoring of alarms and the problems that could occur as a result of a long term power outage (ie. greater than 12 hours).

In relation to operational costs to the household, SWC has provided evidence from similar systems that household electricity costs are expected to be on average higher by $30 per year. This would be more than offset by the significant saving in connection costs. SWC has also stated that the system to be installed in Belimbla Park would be 'top of the range' and relatively maintenance free. They stated that residents were best placed to inform SWC of faults or where an alarm was triggered.

SWC stated that water usage was likely to significantly decline during a long term power outage providing over 12 hours average storage capacity in household collection tanks. Nonetheless, SWC agreed to develop procedures for emergency pump outs of collection tanks in the event of a long term power outage.

The Department is generally satisfied that the impacts on the householder of the LPSS will be relatively minor and, based on the information from SWC, the system would have low maintenance requirements.

The Department believes that an annual electricity charge of $30 would be more than offset by the reduced connection costs.

To ensure that residents understand their responsibilities with the system and how to contact SWC for maintenance or in the event of an emergency, the Department has recommended a condition requiring the preparation of a focussed Information and Education Program including a Homeowner's Manual to be distributed to all residents. The Department has also recommended amendments to the Operational EMP condition requiring that contingency procedures to deal with long term power outages be developed by SWC in consultation with relevant power suppliers. As part of an audit process following an appropriate period of operation, SWC would be required to review the effectiveness and reliance on householders to respond to alarms and respond to any serious issues raised.

Flora and fauna

Extensive areas identified as the threatened community Shale Sandstone Transition Forest and several populations of the threatened flora species *Acacia pubescens* are present in Belimbla Park. SWC committed in the Representations Report to undertaking detailed flora surveys in advance of construction work to ensure that the pipelines avoid areas where *Acacia pubescens* is present. Where necessary horizontal drilling would be used to avoid the species and minimise other vegetation impacts.

The Department is satisfied that the existing Conditions of Approval, requiring SWC avoid impacts on Shale Sandstone Transition Forest and *Acacia pubescens*, and the commitment to detailed flora surveys in advance of construction are sufficient to minimise impacts on flora and fauna.

Chemical dosing facility

To reduce the potential formation of odours in the LPSS in Belimbla Park, SWC proposes the installation of a chemical dosing station. In response to community concerns about the original location of the facility it has been relocated to Gundungurra Park (near the corner of Binalong Road and Kundabung Street). Ferric chloride has been selected by SWC as the chemical for dosing. It is a Class 8 (corrosive) dangerous good as defined under the *Dangerous Goods Act 1975*.

The Department recommends the inclusion of a new condition requiring that detailed design of the facility is carried out in consultation with Council, WorkCover and surrounding residents. The condition also requires SWC ensure:

- that the storage of ferric chloride is in accordance with WorkCover and Australian Standard requirements;
- the visual impacts of the facility are minimised;
- the need to fence the facility is negotiated with WorkCover and Council; and
- that areas of Shale Sandstone Transition Forest are not disturbed during construction.

Conclusions and Recommendations

The Department is satisfied that an EIS was not required for the modification. The provision of a low pressure sewerage system in Belimbla Park would appear to have a number of advantages over a gravity based system, including reduced connection costs for householders, reduced disturbance during construction (by being able to lay the reticulation pipes within the road reserve) and reduced ability for infiltration. As a relatively new type of system in Australia it is important that the Proponent ensures that it is operated effectively and any problems are responded to quickly and efficiently.

The Department's review indicates that the advantages of the proposed low pressure system would appear to outweigh the disadvantages. Uncertainty of householders about the system's operation and reluctance for some to connect to the new system is not unexpected considering that it is a new system, and would appear to be the main risk to its success. It is therefore imperative that Sydney Water continues with an effective education and consultation strategy for the area and implements both short and long term contingency plans in the event of a power outage or other breakdowns in the system. The audit programme would also provide feedback on maintenance performance by SWC. The Department's review concludes that, provided comprehensive mitigation measures are implemented during construction and operation of the system, any adverse impacts of the proposal could be reduced to an acceptable level.

The Department's assessment has concluded that, provided the Recommended Conditions of Approval contained in Section 6 of this Report are adopted, the proposal could be approved by the Minister for Infrastructure and Planning.

1. INTRODUCTION

1.1 The Approved Oaks, Oakdale and Belimbla Park Sewerage Scheme Project

The then Minister for Urban Affairs and Planning, Hon. Dr. Andrew Refshauge MP, granted approval on 23 July 2001 to the Sydney Water Corporation (SWC) to construct and operate The Oaks, Oakdale and Belimbla Park Sewerage Scheme. The Minister's approval was subject to 77 Conditions of Approval (MCoA).

The approved Oaks, Oakdale and Belimbla Park Sewerage Scheme involved the construction of a gravity based reticulation sewerage system in the three towns including five sewage pumping stations. The sewage would be transferred from the reticulation systems via a main pipeline to the existing West Camden Sewage Treatment Plant.

Construction work for the gravity reticulation systems and two Sewage Pumping Stations (SPS) (reduced from five SPSs during detailed design) within The Oaks and Oakdale and the transfer main were undertaken between 2001 and 2003. Residents in these two towns have been able to connect to the new system since August 2003.

1.2 The Proposed Modifications

SWC has now sought to modify the approved project to allow for the servicing of Belimbla Park area as a low pressure sewerage system (LPSS) rather than a gravity system. A LPSS is preferred for Belimbla Park by SWC due to the high cost, sensitive environment and technical difficulties of providing a gravity based reticulation system. Belimbla Park consists of 167 property lots that are generally large rural/residential blocks and has a population of approximately 520.

Details of the LPSS for Belimbla Park are given in the Review of Environmental Factors (REF) prepared by SWC which is summarised in Section 2.1 of this Report.

1.3 Statutory Provisions and Assessment Process

Sydney Water Corporation Limited (SWC) is a Statutory State owned corporation under the *Water Legislation Amendment (Drinking Water and Corporate Structure) Act 1998* which came into operation on January 1, 1999. Prior to this, SWC was a company State owned corporation. This project was identified in the *Sydney Water (Transitional) Regulation 1999* which was enacted to ensure that certain planned Sydney Water developments would still be considered under Section 37A of the *State Owned Corporations Act 1989 (SOC Act),* i.e. as though Sydney Water was still a company State owned corporation.

In September 1999, under the provisions of the SOC Act, the then Minister for Urban Affairs and Planning certified the proposed The Oaks, Oakdale & Belimbla Park Sewerage Scheme as being of State or regional significance. The Minister also determined that the proposal would be likely to significantly affect the environment and directed Sydney Water Corporation to prepare an EIS under the provisions of Part 5 of the EP&A Act.

Section 115BA of the EP&A Act provides that a Proponent may request the Minister to modify an approval granted under Section 115B of that Act if the modification of the approved activity would be

inconsistent with the approval. In requesting a modification, the Proponent is also required under Section 115BA(4) of the EP&A Act to determine whether the proposed modified activity would be likely to significantly affect the environment. SWC has determined that the proposed modification would not significantly affect the environment and accordingly an REF has been prepared.

In accordance with Section 115BA(5)(b), SWC publicly exhibited the REF between 4 August 2003 and 18 August 2003. Sixteen representations were received by the Proponent in response to the REF exhibition and forwarded to the Department as required by the EP&A Act.

The Proponent sought the approval of the Minister for Infrastructure and Planning for the modification, in accordance with Section 115BA(2), in a letter dated 27 October 2003.

1.4 Purpose of this Report

The purpose of this Report is to review the REF, issues raised in representations, and other relevant matters pertinent to the potential environment impact of the proposed modification. 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 for Infrastructure and Planning on the proposed modification.

2. DESCRIPTION OF PROPOSED MODIFICATIONS AS DESCRIBED IN THE REF

This section provides a description of the Proposed Modification described in the REF. It provides an overview of the information presented in the REF and does not necessarily represent the views of the Department. The Department's consideration of the modified Proposal is provided in Sections 4 and 5.

2.1 Proposed Modification Description

2.1.1 General Description

The proposed modification involves the installation of a LPSS in Belimbla Park where previously a gravity sewerage system had been approved by the Minister. A LPSS operates under a pressurised system with a collection tank and grinder pump connected in each property served by a small diameter line from the pump system to a collection pipeline in the street. An indicative layout of the proposed LPSS for Belimbla Park (as indicated in the Representations Report) is shown in Figure 2.1.

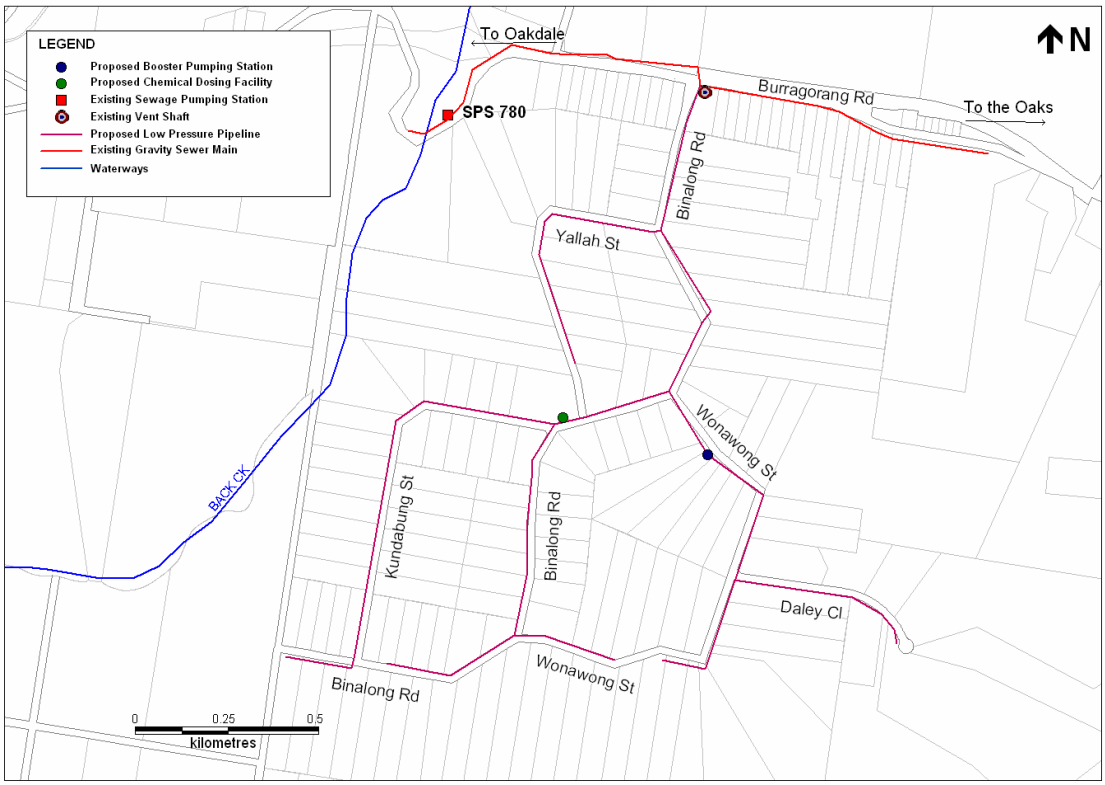

Figure 2.1 – Indicative layout of LPSS in Belimbla Park

Associated with the new LPSS is a redesign of the reticulation system where the majority of collection pipelines have been relocated into the streets. The Belimbla Park LPSS would connect to the main transfer on Burragorang Road. Associated with the LPSS is the installation of a chemical dosing facility. The house services, reticulation services and chemical dosing facility that make up the key elements of the LPSS are discussed below.

2.1.2 House Services

Wastewater from the household would drain via the house service line to the collection tank. Two types of collection tanks would be installed depending on number of bedrooms and household size, the smaller tank with 370L capacity and the larger tanks with 570L capacity. The tanks would usually be installed close to the house and usually adjacent to the existing septic tank to minimise connection costs. The majority of the collection tank would be situated underground with a lid of approximately 0.7m diameter protruding approximately 100mm above ground.

Within the collection tank would be a grinder pump unit which would automatically turn on when waste water levels reached a pre-controlled height within the collection tank. The remainder of the collection tank would be available for emergency storage capacity. The grinder pump would be barely audible and is not expected to impact on households. The REF stated that a long period of disuse of the pump may lead to sewage in the collection tank becoming septic and a short duration of localised odours could result as the pump started again.

The grinder pump would be connected to the household power supply by a separate circuit. A control/alarm panel would also be installed on each property, usually on the side of the house. If the sewage in the collection tank exceeds the alarm level as a result of pump failure an alarm (flashing light and siren) would be activated to alert the householder to a problem. The audible alarm can be switched off by the householder and the householder would need to contact SWC for a service or repair of the unit.

The collection tank and pump would be connected via a small pipeline to a collection line in the street.

SWC would install and be responsible for maintaining the collection tank and the grinder pump; the alarm control system and the pipeline from the collection tank to the street collection pipeline. The householder would be responsible for installing the connection of their house service link to the collection tank and ensuring that the plumbing and electrical systems conform to SWC standards. The householder would also be responsible for the ongoing cost of power for the grinder pump which was estimated at approximately $30 per year for the average sized family.

2.1.3 Reticulation

The adoption of the LPSS has led to a redesign of the reticulation system in Belimbla Park where, in the majority of cases, the collection pipelines could be situated in the road reserve avoiding the constraints of a gravity based system where many collection pipelines transverse private properties. The pressurised system also allows for shallower trenching and a small 110mm diameter polyethylene pipeline to be used. It was stated that the LPSS reticulation would result in fewer construction impacts than the approved gravity based system. The Proponent has also committed to using underground boring techniques to limit disturbance in sensitive areas.

The reticulation system relies on the 'head pressure' from household pumps to move sewage along the pipelines. However, at a location in Wonawong Street the gradient is very steep and the need for a booster pumping station was identified. It was envisaged in the REF that the booster pump arrangement would consist of a larger tank containing several grinder pumps. The tank would be installed in the road reserve and the tank lid would be the only part of the booster station visible on the surface.

Small air valves (approx 25mm in diameter) would be installed at high points in the system to allow the 'purging' of any air. Flushing points consisting of a one way valve would also be installed as part of the reticulation system allowing potable water to be pumped into the system for the purposes of flushing lines or other maintenance.

2.1.4 Chemical Dosing Facility

To reduce the potential formation of odours in the LPSS and escape of these odours at the vent shaft located at the corner of Burragorang and Binalong Roads, the Proponent proposes the installation of a chemical dosing station. The chemical dosing unit would consist of pumps, a metering device, electrical kiosk and collection tank with a capacity of 4,500 litres (later revised to 2,000 litres) (refer to Figure 2.2 for example). The unit would have dimensions of approximately 5m x 10m and associated facilities would include a chemical shower, truck access road, bunding and a security fence around the facility.

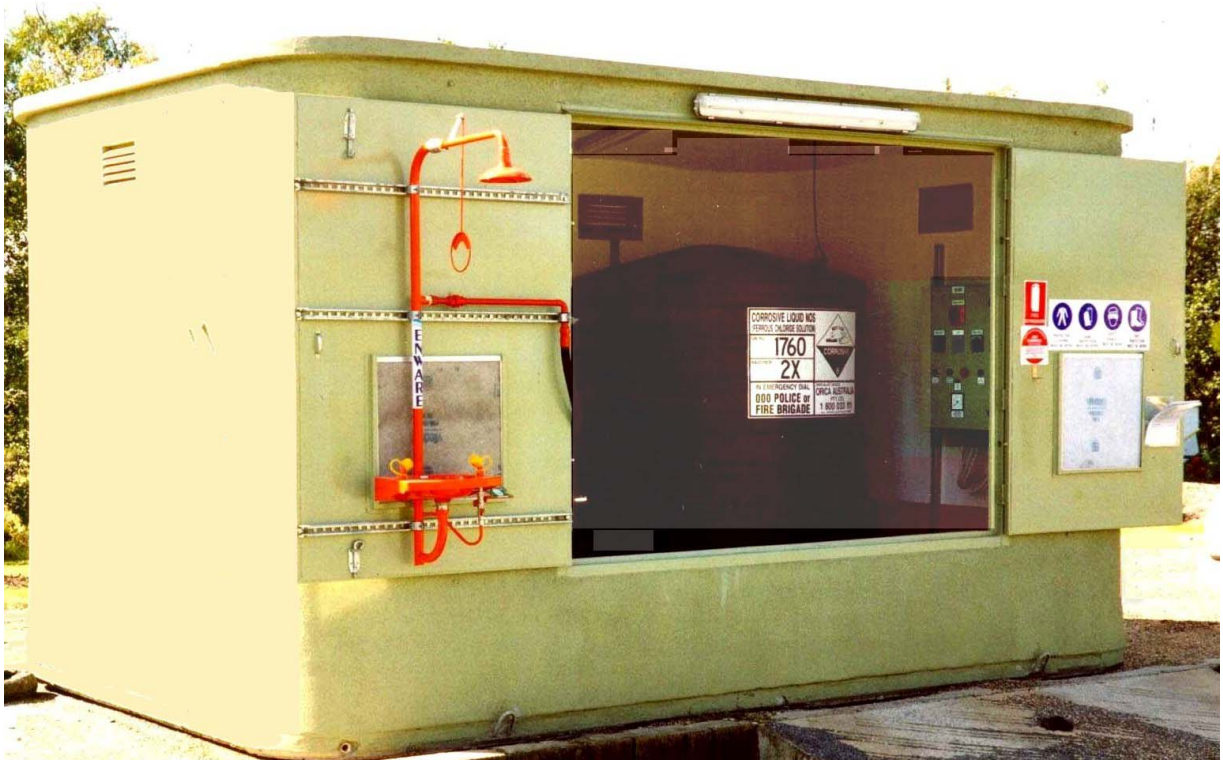

Figure 2.2 – Example of a Typical Chemical Dosing Facility

Ferric chloride has been selected by the Proponent as the chemical for dosing and has been preferred over Nutriox for this location due to its fast reaction time. Ferric chloride is a corrosive material requiring a dangerous goods approval and a licence from WorkCover for its use and storage. Road tankers would refill the dosing facility.

The REF proposed that the dosing facility would be located on private land near the corner of Yallah Street and Binalong Road. The proposed location of the chemical dosing unit was relocated to Gundungurra Park near the corner of Binalong Road and Kundabung Street in the Representations Report. Issues in regard to the chemical dosing facility are discussed further in Section 4.4.

2.1.5 Construction Activities

The extent of work required during construction would be reduced for the LPSS compared to a gravity system. The work would include:

- site establishment;
- surveying and pegging;
- clearing the pipeline route;
- conventional trenching in streets and on properties;
- installation of collection tanks on properties;
- electrical connections to properties; and
- testing.

Standard working hours would be used and it is expected that the construction of the LPSS reticulation system would take 6 months. The on-site property reticulation and installation of collection tanks would occur progressively as customers request connection with most connections estimated to be complete within 12-18 months after completion of the reticulation system. Installation of the collection tank at each property would take no more than a day.

2.2 Justification for Proposed Modification

The REF indicated that the LPSS is preferred over a gravity system because of:

- reduced connection costs to residents, as the collection tank can be located close to the dwelling, reducing the length of connecting pipework property owners need to install (SWC estimates connection costs on average would be $2,000-$3,000 less for LPSS);
- reduced construction impacts to residents as a result of small, shallow pipes used;
- collection pipes located in road reserves, rather than private property;
- the system minimises wet weather infiltration reducing downstream impacts on West Camden STP; and
- reduced construction timeframes and costs to SWC.

2.3 Modifications to Conditions of Approval Suggested by Proponent

The Proponent suggested changes to Condition No. 1 to accommodate a description of the revised proposed scheme in Belimbla Park. No other changes were proposed to the MCoA.

3. SUMMARY OF REPRESENTATIONS

3.1 Representations Made in Relation to the REF

Sixteen (16) representations were received in response to the notice of public exhibition of the REF. Twelve representations were received from individuals and two representations from groups in a petition-style representation objecting to the proposal containing 80 signatories. The Environment Protection Authority (now DEC) and Sydney Catchment Authority sent the other representations.

3.2 Identification of Key Issues

The key issues identified in the representations included concerns:

- that residents would receive an inferior service and a request for a gravity based system;
- in regard to household impacts including costs, maintenance responsibilities and power outages; and
- with the location and impacts of the chemical dosing facility.

These issues are discussed further in the following Chapter of this report.

4. ASSESSMENT OF KEY ISSUES

This Section of the Report provides an assessment of the key environmental impacts of the Proposal based on an examination of the REF, issues raised in representations made during the exhibition period and the Proponent's response to these issues presented in its request for approval and during further consultation with the Department.

4.1 Gravity Versus LPSS

4.1.1 Background

The modification consists of the construction of a LPSS instead of a traditional gravity system. The Proponent stated that a LPSS was suited to Belimbla Park due to large block sizes and steep terrain. Similar systems are being installed or proposed by SWC as part of the Stanwell Park, Coalcliff, Otford and Jamberoo schemes and potentially as part of the Brooklyn and Dangar Island scheme. A number of LPSS have operated in the United States of America (USA) for up to 30 years.

4.1.2 Key Issues

A number of representations were received, including those from the group petition style representations requesting that the area of Belimbla Park be serviced by a gravity system rather than the LPSS. Several of these representations raised concerns that the LPSS was an inferior, high maintenance scheme and that SWC should test the viability of the system in a less environmentally sensitive area. Some representations suggested that they would not connect to a LPSS.

4.1.3 Consideration of Key Issues

In response to the issues raised, SWC stated that there were considerable advantages to a LPSS compared to a gravity system such as reduced costs for connection for households (estimated by SWC on average to be $2,000 - $3,000 per household), reduced infiltration potential as well as reduced costs of construction to SWC (estimated to be approximately 25% less than a gravity system in Belimbla Park). SWC stated that in its opinion the scheme was not inferior to a conventional gravity system. They referred to LPSS schemes in use in the USA for over 30 years which had proved to be reliable and relatively maintenance free.

In response to the suggestion that a number of residents would not connect to a LPSS if installed, SWC undertook an extensive door knock of residents in Belimbla Park. The door knock reached about half of the residents in Belimbla Park and found that approximately 50% of those surveyed intended to connect to the LPSS within two years of installation with a further 31% undecided. 14% stated that it depended on finances and 7% stated they would not connect. After being provided with more information from SWC on a LPSS, only 24% of those interviewed were opposed to the LPSS scheme although a number of these indicated they may connect.

It should be noted that more than half of those residents that signed the petition objecting to the LPSS were interviewed by SWC. Over 40% of these residents indicated that they would connect to the scheme within two years and a further 30% were undecided.

The Department notes the concerns of a number of residents about the provision of a LPSS in Belimbla Park. The Department is also aware that such schemes have been introduced in Tooradin, Victoria and

is being installed by SWC in some suburbs of Otford, Stanwell Park and Coalcliff as part of the Northern Towns of Illawarra Sewerage Scheme.

The LPSS appears to offer a number of advantages over a gravity system in terms of reduced connection costs, reduced potential for infiltration and less disturbance during construction. Given the large block sizes and undulating topography the installation of a gravity system in Belimbla Park would be relatively difficult and expensive. It is noted that the representation from DEC acknowledges the apparent benefits of the LPSS scheme.

In principle, the Department has no objection to the provision of a LPSS for Belimbla Park. Based on SWC surveys, it appears that the majority of residents will eventually connect to the LPSS. The Department recommends modification to Condition of Approval No. 30 requiring SWC to detail the results of any comparative assessment of relative energy use between LPSS and gravity systems in the Environmental Impact Audit Report. Issues remain with regard to the requirements of the householder, however, on the whole these appear to be manageable and are discussed further below.

4.2 Impacts at the Household

4.2.1 Background

The LPSS requires that the householder monitor the operation of the system and inform SWC if alarms are triggered and/or there is a need for maintenance. Although SWC would own and maintain the collection tank, grinder pump and service pipeline from the road to the collection tank, the onus would be on the householder to report any malfunctions in the system to SWC.

4.2.2 Key Issues

A number of representations raised concerns about the impacts on the householder from the installation of an LPSS. The issues included concerns about:

- the alarm system and monitoring;
- long term power outages (ie. over 12 hours) and potential overflows;
- the operational electricity costs and the impacts on existing power board;
- the implications on potential development; and
- the long term maintenance requirements.

4.2.3 Consideration of Key Issues

Alarm System

In the event of a breakdown of an individual pump an alarm installed at households would be triggered. The onus is on the property owner to monitor the alarm and contact SWC to organise a maintenance visit. SWC stated in the REF that if a householder was away and the alarm was tripped then neighbours would be responsible for informing SWC.

A number of representations raised concerns about the way the alarm system would work. Some representations stated that it was unreasonable to expect householders to monitor the alarm and contact SWC and that telemetry should be installed to immediately advise SWC of alarm. Another representation suggested that given the large block sizes, relying on neighbours if residents were away was not reasonable. One representation stated that being hearing impaired meant that the alarm

system would not be suitable for them. It was also suggested that a battery backup system be installed to the alarm system in the event of a power outage.

In response to these representations, SWC stated that it did not believe that the reliance on householders to monitor the alarm and inform SWC was unreasonable and that a telemetry system would be cost prohibitive. SWC has advised that the systems installed in the US do not operate with household telemetry. Similarly, SWC stated that battery backups were considered for the alarm system but discounted due to the cost (refer to further discussion on power outages below).

SWC stated that if a homeowner is away from the house it is unlikely that any wastewater would be generated and limit any potential for the alarm to be activated. SWC stated that it would work with individual customers with special needs (i.e. hearing impaired) to ensure that the alarm system meets their needs. SWC also stated that it would prepare a Homeowner's Manual for residents detailing the system and their responsibilities.

The Department is satisfied that alarms are rarely likely to be triggered in a well maintained system. Residents are well placed to monitor alarms and inform SWC so long as they are educated in how to monitor the system. The Department therefore recommends the inclusion of a new Condition of Approval requiring that the Proponent prepare a focussed Information and Education Program including a Homeowner's Manual prior to operations. The Manual must detail the system, responsibilities of the householder and how to contact SWC. The Manual must also be tailored to individual householder needs. As part of an audit process following an appropriate period of operation, SWC would be required to review the effectiveness and reliance on householders to respond to alarms and respond to any serious issues raised.

Power Outages

A number of representations raised concerns that common long term power outages (ie. during bushfires) and brown outs during peak times in the area would lead to frequent household overflows. The Department and other representations also asked what emergency responses SWC would undertake in the event of a long term power outage.

In response SWC stated that the LPSS collection tank proposed for Belimbla Park has sufficient storage space for up to 12 hours of normal household usage. It stated that during a long term power outage storage capacity would likely be longer as many of the appliances that use water (eg. dishwashers, washing machines, electric hot water heaters) would not be working. SWC also stated that experience from the USA indicated that people reduced their water usage in the event of a power outage and that initiatives for the householder would be detailed in the Homeowner's Manual.

SWC stated that crews with portable generators would be sent to Belimbla Park to pump out critical holding tanks in the event of a long term power outage. The crews would be available 24 hours a day, 7 days a week. SWC indicated that the crew would be put on stand-by after a power outage lasting four hours and mobilised if the power outage extended beyond six hours. A generator connection point would be installed near the control box for each pump and SWC stated that due to the low number of households and the speed at which pump outs could occur, overflows were unlikely. SWC also stated that contact from residents or telemetry associated with the downstream pumping stations would alert SWC to extended power outages.

It appears apparent that power outages, some for lengthy periods, are currently common in Belimbla Park. It is important that SWC prepare detailed contingency procedures to deal with a long term power

outage. The Department therefore recommends the inclusion of modifications to Condition of Approval No. 28, part (g) requiring, as part of the EMP (Operation Stage), detailed contingency procedures and emergency responses in consultation with relevant energy providers to avoid overflows at households in the event of long term power outages.

Electricity Costs

Several representations objected to having to pay for the ongoing electricity costs generated by the LPSS household pump and it was suggested that this charge be offset by SWC from resident's annual sewer service fee. Some representations also raised doubts about the estimated annual electricity costs and concerns about electricity cost increases in the future.

In response SWC stated that the significant reductions in household connection costs (on average by about $2,000 - $3,000 per household) would more than offset the estimated $30 per year in electricity costs. SWC recognised that the price of electricity may increase in the future but that this was subject to approvals from the NSW Independent Pricing and Regulatory Tribunal (IPART).

SWC stated that the $30 per annum estimate was based on usage of the same type of system in the USA and was likely to be higher than the cost for most households. It was suggested that the energy use for the pump was on average less than running a 60W light.

The Department is satisfied that the estimated electricity costs for households does not appear to be a major impost and would be more than offset by reduced connection costs. It should be further noted that the cost of providing the priority sewerage programme is in effect being subsidised by the SWC existing customer base through higher charges.

IPART would be responsible for determining whether the additional electricity cost should be offset by lower SWC user charges in Belimbla Park. The Department understands that IPART has not yet finalised its decision on the need for an offset and may consider the issue during the next round of future SWC pricing due to occur later this year.

Future Development

A few representations requested further information on how a LPSS in Belimbla Park would accommodate future growth or subdivision of existing blocks. One representation requested details of what would happen if household size increased and another representation requested how a bed and breakfast business would be accommodated.

SWC stated in the Representations Report that as Belimbla Park is situated in a Special Uses 5(c2) – Water Catchment zoned area future development or subdivision would be severely limited. Infill development within the existing urban areas would be accommodated in the design of the LPSS, however, should rezoning occur in the future the developer would be responsible for financing additional expansions of the LPSS.

SWC stated that increased flows resulting from increased household sizes would result in the pump operating for longer periods in a day. It would not normally require an increase in collection tank size or duplication of tanks. However, in response to the representations from the bed and breakfast establishment, SWC stated that as a commercial operation SWC would identify with the owner the best way to service the business which may involve larger or more collection tanks.

Maintenance

Questions raised in representations in regard to maintenance included:

- How SWC would ensure that maintenance was undertaken promptly?;
- Whether SWC would be undertaking preventative maintenance on the systems and if so how often?; and
- Where residents would be responsible for maintenance charges?

In response, SWC stated that it would be utilising the best LPSS available produced by the 'E-one' company in the USA. SWC presented in the Representations Report statistics from the USA indicating that in areas where the 'E-one' system had been installed for some time the mean time between service callouts at households was between six and ten years. SWC therefore stated that with correct installation it believed that the LPSS could be installed as a 'set and forget' rather than requiring scheduled periodic maintenance. A maintenance crew would be available to respond quickly to any required repairs or maintenance detected by householders.

SWC clarified that it would cover the full costs of maintenance or repairs to the LPSS. Only in the event of wilful damage to the system would a householder be responsible for the associated repair or replacement costs.

On the basis of the information presented by SWC the Department is satisfied that preventative maintenance is not necessary for the LPSS in Belimbla Park. It is essential that SWC responds quickly to householder requested maintenance and repairs to prevent overflows and the Department therefore recommends modifications to Condition of Approval No. 34 requiring maintenance procedures be detailed in the Asset Management Plan to be prepared by SWC.

4.3 Flora and Fauna

4.3.1 Background

Extensive areas identified as the threatened community Shale Sandstone Transition Forest (as listed in Schedule 1 of the *Threatened Species Conservation Act 1995* (TSC Act)) are present in Belimbla Park. Several populations of the flora species *Acacia pubescens* (also listed in the TSC Act) are also located in Belimbla Park, often on the disturbed fringes of the Shale Sandstone Transition Forest in road verges.

The approved activity included Conditions requiring that areas of Shale Sandstone Transition Forest and *Acacia pubescens* be avoided during construction. In places this meant small scale boring and drilling gravity pipelines under areas of threatened communities and flora species.

SWC stated in the REF that these conditions would be complied with for the modified activity. It stated that an advantage of the LPSS was that pipelines would generally be within the road corridor and could be positioned to avoid existing vegetation. The booster pumping station would be situated in a cleared area.

The proposed chemical dosing facility was situated in a cleared area in the REF. The amended placement of the facility in the Representations Report to Gundungarra Park is within the vicinity of identified areas of Shale Sandstone Transition Forest. SWC stated that vegetation in the Park would

not be impacted by the construction of the dosing facility. Further discussion on the placement of the facility is contained in Section 4.4.

4.3.2 Key Issues

Given that the LPSS reticulation lines follow roads closely and this is where stands of *Acacia pubescens* are generally found, the Department sought clarification from SWC as to how this species would be avoided.

4.3.3 Consideration of Key Issues

SWC committed in the Representations Report to undertaking detailed flora surveys in advance of construction work to ensure that the pipelines avoid areas of *Acacia pubescens*. Where necessary horizontal drilling would be used to avoid the species and minimise other vegetation impacts.

The Department is satisfied that the existing Conditions of Approval, requiring SWC avoid impacts on Shale Sandstone Transition Forest and *Acacia pubescens*, and the commitment to detailed flora surveys in advance of construction are sufficient to minimise impacts on flora and fauna.

4.4 Chemical Dosing Facility

4.4.1 Background

As detailed in Section 2.1, to reduce potential odour formation in the LPSS in Belimbla Park, SWC proposes to install a chemical dosing station. Ferric chloride has been selected by SWC as the chemical for dosing and has been preferred over Nutriox for this location due to its fast reaction time. Ferric chloride is a Class 8 (corrosive) Dangerous Good as defined under the *Dangerous Goods Act 1975*. Whilst storage of ferric chloride at these volumes does not require the preparation of a preliminary hazard analysis (PHA) a qualitative risk assessment was done as part of the REF.

The REF proposed that the dosing facility would be located on private land near the corner of Yallah Street and Binalong Road. The proposed location of the chemical dosing unit has since been relocated by the SWC to Gundungurra Park near the corner of Binalong Road and Kundabung Street. The Representations Report included an environmental assessment of the revised location for the facility and concluded there would be no significant impacts.

4.4.2 Key Issues

The key issues raised in regard to the chemical dosing facility included:

- request for further details on the facility;
- concerns about the location of the facility; and
- concerns over the risks of ferric chloride and why this was preferred as the dosing agent rather than nutriox.

4.4.3 Consideration of Key Issues

The Department requested SWC provide further details of the design of the chemical dosing facility. In response SWC stated that the facility would likely be of a fully contained unit (the size of a small electricity substation) that could be 'dropped' into place. The unit would be situated within a concrete

bund designed to contain 110% of stored liquid to ensure spills are contained. Although the REF had indicated that some of the facility could be placed underground the Representations Report clarified that the facility would be totally above ground for safety reasons and to reduce costs.

Within the unit would be a 2000 litre storage tank, several small pumps and a metering device. It is envisaged that between 350 and 900 litres of ferric chloride would be dosed each month. A tanker delivery of ferric chloride would therefore need to be delivered every two to four months. To accommodate these deliveries a sealed driveway would need to be constructed. SWC also stated that the facility may need to be fenced depending on requirements of WorkCover and Wollondilly Shire Council.

As stated earlier, SWC changed the location of the chemical dosing facility to Gundungurra Park in response to some of the concerns raised in representations. SWC stated that the precise location of the facility within the Park would be subject to discussions with Wollondilly Shire Council, however, preliminary investigations indicated the facility could be established adjacent to trees approximately 15 metres off Binalong Road.

SWC stated that the revised location was more remote from surrounding residents than the previous location and could be more easily screened by existing vegetation and additional landscaping. SWC stated that the seven closest properties to the revised facility had been sent letters advising them of the change and detailing where submissions could be made. No submissions were received by SWC in regard to the letter. SWC has also been liaising with Wollondilly Shire Council about use of the Park.

Several representations including those from the Sydney Catchment Authority and Environment Protection Authority requested additional details and raised concerns about the risks associated with the use of ferric chloride. In response, SWC stated that all work would be carried out in accordance with WorkCover requirements and a licence would be obtained covering the use of ferric chloride. The site would be bunded to ensure spills are contained and would be secure.

The Department is satisfied that the revised location for the chemical dosing facility reduces impacts as it is located further from residents and can be more easily screened reducing visual impacts. The Department understands that it is not uncommon for SWC to use ferric chloride within its systems, particularly at its SPSs and that appropriate procedures and licence requirements for the use of this chemical would be resolved with WorkCover.

The Department recommends the inclusion of the new Condition of Approval No. 78 requiring that detailed design of the facility is carried out in consultation with Council, WorkCover and surrounding residents. The condition also requires SWC ensure:

- that ferric chloride is stored at the facility in accordance with requirements of WorkCover and Australian Standards;
- the visual impacts of the facility are minimised;
- the need to fence the facility is negotiated with WorkCover and Council; and
- that areas of Shale Sandstone Transition Forest are not disturbed during construction.

5. CONCLUSIONS AND RECOMMENDATIONS

The Oaks, Oakdale and Belimbla Park Sewerage Scheme was approved in July 2001. Connections to the system in The Oaks and Oakdale were available from late 2003.

SWC has sought to modify the approved project to allow for the installation of a LPSS in the Belimbla Park section. A LPSS operates under a pressurised system with a collection tank and grinder pump connected in each property. Associated with the LPSS would be a redesign of the reticulation system where the majority of collection pipelines have been moved into the streets and the installation of a chemical dosing facility to reduce the potential for odours. The cost savings of this modification have been estimated to be 25% lower than a gravity based system. SWC prepared a REF for the proposal which assesses whether the proposed modification would be likely to significantly affect the environment.

Sixteen (16) representations were received in response to the public exhibition of the REF including two representations from groups in a petition-style representation objecting to the proposal containing 80 signatories.

The provision of a LPSS in Belimbla Park would appear to have a number of advantages over a gravity based system, including reduced average connection costs for householders, reduced disturbance during construction (by being able to lay the reticulation pipes within the road reserve) and reduced ability for infiltration. As a relatively new type of system in Australia it is not unexpected that there are concerns raised about its effectiveness. It will be critical for the Proponent to ensure residents are informed and educated about the system and that it is operated effectively and any problems are responded to quickly and efficiently.

The Department's review has indicated that the advantage of the proposed LPSS would appear to outweigh any disadvantages. Uncertainty of householders about the system's operation and reluctance to connect to the new system would appear to be the biggest risk for its success. It is therefore imperative that Sydney Water continues an effective education and consultation strategy for the area and implements an appropriate contingency plan in the event of a long term power outage or other breakdown in the system. As part of an audit process following an appropriate period of operation, SWC would be required to review the effectiveness and reliance on householders to respond to alarms and respond to any serious issues raised.

Other issues investigated in the report have included the impacts on the threatened flora species *Acacia pubescens* and Shale Sandstone Transition Forest communities and the impacts of the proposed Chemical Dosing Facility.

Based on this assessment the Department has recommended modifications to existing conditions of approval including the development of detailed procedures for emergency response by SWC to any long term power outages. The Department has also recommended new conditions requiring SWC consult with Council, WorkCover and surrounding residents to minimise any potential residual impacts of the Chemical Dosing Facility and the development of a Homeowners Manual to inform residents of how the LPSS functions and their responsibilities.

The Department's assessment concludes that, provided the Recommended Modifications to the Conditions of Approval are adopted as detailed in Chapter 6, the proposal would reduce the overall environmental impact of the approved project and could be approved by the Minister.

6. RECOMMENDED CONDITIONS FOR MODIFICATION

This section provides the Department's recommended variations of the Minister's conditions of approval for The Oaks, Oakdale and Belimbla Park Sewerage Scheme, under Section 115BA(6) of the EP&A Act. These recommended variations of the Minister's approval conditions are based on the Department's assessment of the REF for the proposed modified activities and supplementary information and advice provided.

It is noted that the REF contains information on procedures and mitigation strategies to be implemented to ameliorate impacts of the proposed modification. The recommended conditions should therefore be implemented in conjunction with those mitigation strategies specified in the REF. Where there is an inconsistency with the recommendations in the REF, the recommendations in this report would prevail.

The Department recommends the following variations to the conditions of Approval. Insertions to conditions are presented in "italics" (eg. *italics*) and deletions are "struck through" (eg. ~~struck through~~).

Condition 1

1. The ~~proposal~~ *Project* shall be carried out in accordance with:

   - the proposal contained in the environmental impact statement (EIS), The Oaks, Oakdale & Belimbla Park Priority Sewerage Program prepared for the Sydney Water Corporation (SWC) by CH2MHILL Australia, dated September, 1999 *as modified by the Review of Environmental Factors – Low Pressure Sewerage System at Belimbla Park, dated August 2003 and the Representations Report for a Low Pressure Sewerage System at Belimbla Park, dated October 2003;*
   - all identified plans, safeguards and mitigation measures presented in the Representations Report prepared by SWC, dated August 2000 (including all measures outlined in Table 6.1) *as modified by the Review of Environmental Factors – Low Pressure Sewerage System at Belimbla Park, dated August 2003 and the Representations Report for a Low Pressure Sewerage System at Belimbla Park, dated October 2003*;
   - The Oaks, Oakdale & Belimbla Park Sewerage Scheme Director General's Report ~~(hereafter referred to as 'the Director General's Report')~~ *dated June 2001 as amended by The Oaks, Oakdale and Belimbla Park Sewerage Scheme – Proposed Modification – Low Pressure System at Belimbla Park Director General's Report dated January 2004*; and
   - the conditions of approval granted by the Minister.

Condition 2

2. Despite the above, in the event of any inconsistency with the proposal as described in the EIS, Representations Report, *Review of Environmental Factors – Low Pressure Sewerage System at Belimbla Park and/or the Representations Report for a Low Pressure Sewerage System at Belimbla Park*, the conditions of approval granted by the Minister shall prevail.

Condition 28

28. The EMP (Operation Stage) shall address, but not be limited to:

    (a) identification of the statutory and other obligations which the Proponent is required to fulfil

including all licences/approvals and consultations/ agreements required from authorities and other stakeholders, and key legislation and policies which control the Proponent's operation of the project;

(b) requirements of and compliance with relevant EPA guidelines;

(c) sampling strategies and protocols to ensure the quality of the monitoring program including specific requirements of the EPA and the DLWC;

(d) monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental performance of the project during its operation including description of potential site impacts, performance criteria, specific tests and monitoring requirements, protocols (eg frequency and location) and procedures to follow;

(e) steps the Proponent intends to take to ensure that all plans and procedures are being complied with;

(f) consultation requirements including consultation with relevant government agencies, the local community, Wollondilly Shire Council, Camden Council and the SWC customer complaint procedures;

(g) detailed contingency procedures *prepared in consultation with relevant energy providers* for dealing with: power failures *including, in Belimbla Park, protocols designed to avoid overflows at households and to provide emergency responses in the event of long term power outages*; sewer overflow following failures at the wastewater pumping stations and/or during extended periods of wet weather flows; structural failures in the wastewater transfer pipeline; and bushfires; and

(h) management strategies employed for: noise; access and traffic; water quality; air quality (including odours); health and public safety; landscaping and maintenance and issues relating to flora and fauna; security; waste/resource minimisation, management, removal and disposal; hydrology and flooding; monitoring of the reticulation system particularly in terms of identifying system leaks; chemical handling; hazards and risks and emergency response plans; energy use and measures for minimisation.

Specific requirements for some of the main environmental management elements referred to in (h) shall be as detailed under the conditions of this approval and/or as required under any licence or approval.

The EMP (Operation Stage) shall be made publicly available.

Condition 30

30. An Environmental Impact Audit Report shall be submitted to the Director-General, SCA, Wollondilly Shire Council, Camden Council and the EPA, and upon request by the Director-General, to any other relevant government authority 12 months, two and five years after commissioning of the project, or unless otherwise agreed by the Director-General, and at any additional periods thereafter as the Director-General may require. The technical studies required as part of the report shall be prepared by appropriately qualified, independent specialists. The Report shall assess the key impact predictions made in the EIS and any supplementary studies and detail the extent to which actual impacts reflect the predictions. *Where relevant, data from other SWC schemes in regard to low pressure energy use shall be detailed for comparative purposes.* The suitability of implemented mitigation measures and safeguards shall also be assessed. The Report shall also assess compliance with the EMP (Operation Stage).

The Report shall discuss results of consultation with the local community in terms of feedback/complaints on the construction and operation phases of the project and any issues of concern raised. *The Report shall include, for Belimbla Park, an overview of fault frequency experienced, fault response achieved, maintenance problems not within the normal expectations or experience of LPSS technology and how these problems were addressed.* The Proponent shall comply with all requirements of the Director-General with respect to any measure arising from, or recommendations in, the report.

The Report shall be made publicly available.

Condition 34

34. As part of the EMP (Operation Stage) specified in Condition 28, the Proponent shall prepare an outline of an Asset Management Plan designed to minimise the number and frequency of overflows *and to ensure adequate response to rectify collection tank and grinder pump faults at households*. The Plan shall include proposed monitoring, inspection and testing, incident management and ongoing monitoring and management strategies. A copy of the Plan shall be forwarded to the EPA and SCA.

New Condition 78

78. *During the detailed design process for the Chemical Dosing Facility at Gundungurra Park the Proponent must consult with Wollondilly Shire Council, WorkCover and surrounding residents and ensure that:*

    (a) the visual impacts of the facility are minimised including consideration of use of existing trees in the Park and/or additional landscaping to screen the facility;
    (b) the need to enclose the facility in a fenced enclosure is determined in consultation with WorkCover and Wollondilly Shire Council;
    (c) the ferric chloride shall be stored and handled according to the requirements/recommendations of WorkCover and relevant Australian Standards; and
    (d) native vegetation identified as Shale Sandstone Transition Forest in the Park is not disturbed during construction and other vegetation clearing is minimised.

New Condition 79

79. As part of the EMP (Operation Stage) the Proponent shall develop a focussed Information and Education Program including a Homeowner's Manual. The Manual must detail how the low pressure system works, the responsibilities of the householder and how to contact SWC for maintenance or in case of an emergency. The Manual must also be tailored to individual householder needs such as for people who are hearing impaired. The Manual shall be provided to householders at the time of connecting to the scheme and methods established to make the manual available where house ownership or tenure are transferred.