

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.



Frank Sartor MP
Minister for Planning

C.H.C.C.
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SCHEDULE 1

Application No: 06_0285

Proponent: Coffs Harbour City Council

Approval Authority: Minister for Planning

Land: Lot 2 DP 1083920, 140 Upper Orara Road, Karangi, Coffs Harbour local government area

Project: Construction and operation of a new Water Treatment Plant and transfer facilities to treat all potable water supply flowing to the Council's consumers from the existing Karangi Dam. Associated facilities include aboveground treated water storage and wash water holding tank, emergency storage containment lagoon, control building and pump station.

Major Project: On 10 November 2006, the Minister for Planning formed the opinion, pursuant to clause 6 of *State Environmental Planning Policy (Major Projects) 2005*, that the project is development of a kind described in clause 25 of Schedule 1 and is thus declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies.

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SCHEDULE 2

Act, the	<i>Environmental Planning and Assessment Act, 1979</i>
Ancillary Facility	Temporary facility for construction. Examples are an office and amenities compound, construction compound, batch plant (concrete or bitumen), materials storage compound, stockpile areas.
Conditions of Approval	The Minister's conditions of approval for the project
Construction	Includes all work in respect of the project 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 ancillary facilities such as site compounds, or other activities determined by the Environmental Representative to have minimal environmental impact (e.g. minor access roads, minor adjustments to services / utilities, etc.).
Council	Coffs Harbour City Council
DECC	Department of Environment and Climate Change
Department, the	Department of Planning
Director-General, the	Director-General of the Department of Planning (or nominee)
Director-General's Approval	A written approval from the Director-General (or delegate). Where the Director-General's Approval is required under a 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.
Dust	Any solid material that may become suspended in air
Minister, the	Minister for Planning
Operation	Means the Operation of the project, but does not include commissioning trials of equipment or temporary use of parts of the project during construction.
Project	The project to which this approval applies
Proponent	Coffs Harbour City Council
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 and 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.
Site	The land to which this approval applies.

1. ADMINISTRATIVE CONDITIONS

Terms of Project Approval

- 1.1 The Proponent shall carry out the project generally in accordance with the:
- Major Project Application 06_0285;
 - Coffs Harbour City Council Water Treatment Plant Environmental Assessment*, prepared by Coffs Infrastructure Alliance and dated June 2007;
 - Coffs Harbour City Council Water Treatment Plant Submissions Report*, prepared by Coffs Infrastructure Alliance and dated August 2007; and
 - the conditions of this approval.
- 1.2 In the event of an inconsistency between:
- the conditions of this approval and any document listed from condition 1.1a) to 1.1c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and
 - any document listed from condition 1.1a) to 1.1c) inclusive, and any other document listed from condition 1.1a) to 1.1c) inclusive, the most recent document shall prevail to the extent of the inconsistency.
- 1.3 The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of:
- any reports, plans or correspondence that are submitted in accordance with this approval; and
 - the implementation of any actions or measures contained in these reports, plans or correspondence.

Limits of Approval

- 1.4 This project approval shall lapse five years after the date on which it is granted, unless the works the subject of this approval are physically commenced on or before that time.
- 1.5 The processing capacity of the water treatment plant shall not exceed 42 megalitres per day.

Statutory Requirements

- 1.6 The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required with respect to the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals.

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Water Quality Impacts

- 2.1 The Proponent shall employ soil and water management controls to minimise soil erosion and discharge of sediments and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).
- 2.2 The Proponent shall design, construct, maintain and operate the project such that the water produced by the project meets the performance targets listed in Table 5.3 of the document referred to under condition 1.1b) of this approval and the water quality parameters within the *Australian Drinking Water Guidelines* (NHMRC, 2004).
- 2.3 The Proponent shall design, construct, maintain and operate the project such that there is no discharge of wastewater from the site to the surrounding environment during the operational life of the project. This condition does not apply to supernatant returned to

Karang Dam, wastewater directed to sewer or wastewater trucked from the site in the event of an emergency.

Noise and Vibration Impacts

Construction Hours

- 2.4 The Proponent shall only undertake site preparation and construction activities associated with the project (other than sheet piling, pile driving and any similar impulsive or tonal noise activities), that would generate an audible noise at any residential premises during the following hours:
- 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
 - 8:00 am to 1:00 pm on Saturdays; and
 - at no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.

- 2.5 The Proponent shall only undertake sheet piling, pile driving and any similar impulsive or tonal noise activities during the following hours:
- 9:00 am to 12:00 pm and 2:00 pm to 5:00 pm, Mondays to Fridays, inclusive;
 - 9:00 am to 1:00 pm on Saturdays; and
 - at no time on Sundays or public holidays.

Where these activities are undertaken for a continuous three hour period and are audible to noise sensitive receptors, a minimum respite period of at least one hour shall be scheduled before activities re-commence.

- 2.6 The hours of construction and impulsive/ tonal noise activities specified under conditions 2.4 and 2.5 of this approval may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction or impulsive/ tonal activities specified under conditions 2.4 and 2.5 shall be:
- considered on a case-by-case or activity-specific basis;
 - accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
 - accompanied by sufficient information for the Director-General to reasonably determine that activities during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.

Operational Noise Impacts

- 2.7 The Proponent shall design, construct, operate and maintain the project to ensure that operational noise contributions from the project at the most-affected residential receptor do not exceed an $L_{Aeq(15\text{-minute})}$ noise level of 35 dB(A) at any time. For the purpose of monitoring compliance with this condition, noise contribution from the project shall be measured in accordance with the *NSW Industrial Noise Policy* (EPA 2000).

Air Quality Impacts

- 2.8 The Proponent shall construct the project in a manner that minimises dust impacts generated by the construction works, including wind-blown and traffic-generated dust, on the receiving environment, including sensitive receivers and road users.
- 2.9 The Proponent shall not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, to be emitted beyond the boundary of the site at any time.

Hazards and Risk

- 2.10 Prior to the commencement of construction of the project (except for construction of those works that are outside the scope of the hazard studies), the Proponent shall submit for the approval of the Director-General, the following pre-construction studies:
- a) a **Hazard and Operability Study** for the proposed chlorination plant and associated alarm system chaired by an independent qualified person approved by the Director-General. The study shall be carried out in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 8 – HAZOP Guidelines* (DUAP, 1995). The study report shall be accompanied by an implementation program for all recommendations made in the report. If the Proponent intends to defer the implementation of a recommendation, justification shall be included.
 - b) a **Final Hazard Analysis** for the proposed chlorination plant prepared in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (DoP, 1992). If the final design is unchanged from the design at the project approval stage, the Proponent may request in writing an exemption from this condition from the Director-General.

Heritage Impacts

Aboriginal Heritage

- 2.11 The Proponent shall ensure that all artefacts recovered from the site are provided to the Coffs Harbour and District Local Aboriginal Land Council and Gumbula Julipi Elders and that those parties are permitted to redeposit the artefacts following completion of project-related disturbance works. The location(s) for redeposition of artefacts shall be identified by the Proponent in consultation with the DECC.
- 2.12 In the event that any material of potentially high cultural significance is uncovered during any stage of the project, all disturbance works in the vicinity of the object(s) shall cease immediately, and the DECC, the Coffs Harbour and District Local Aboriginal Land Council and Gumbula Julipi Elders contacted to determine an appropriate course of action prior to re-commencement of work in the vicinity of the object(s).

Non-Aboriginal Heritage

- 2.13 The area around the Dairy Bails building shall be fenced prior to commencement of construction works to avoid any construction impacts to the building. The Proponent shall prepare and implement a conservation and maintenance strategy for the Dairy Bails building to preserve the heritage significance of this building in accordance with NSW Heritage Office guidelines.

Urban Design and Landscaping

- 2.14 Prior to the commencement of construction of the project, the Proponent shall prepare and submit for the approval of the Director-General an **Urban Design and Landscaping Plan** to detail design treatments and landscaping measures for the project. The Plan shall be prepared in consultation with affected landowners surrounding the site, and shall include, but not necessarily be limited to:
- a) landscape elements and built elements, including proposed treatments, finishes and materials of exposed surfaces (including colour specifications and samples);
 - b) landscaping to be undertaken to provide visual screening of the site to affected properties and to revegetate areas affected by construction;
 - c) a schedule of species to be used in landscaping and revegetation;
 - d) identification of existing trees that will be retained on the site;
 - e) timing and progressive implementation of landscaping works; and
 - f) procedures and methods to monitor and maintain landscaped or rehabilitated areas.

Flora and Fauna Impacts

- 2.15 The large, hollow-bearing Sydney Blue Gum on the site shall be retained and protected during construction and operation of the project. The Proponent shall not destroy or otherwise affect the tree without the prior agreement of the Director-General, and only should the retention of the tree pose safety concerns to life and/ or property, as verified by a qualified arborist.

Waste Generation and Management

- 2.16 All waste generated by the project shall in the first instance be beneficially reused and recycled, otherwise the wastes shall be disposed to a waste facility lawfully permitted to accept the materials.
- 2.17 The Proponent shall ensure that all wastes generated as a consequence of the project are assessed and classified in accordance with *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (DEC, 2004).

3. COMPLIANCE MONITORING AND TRACKING

Compliance Tracking Program

- 3.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:
- provisions for periodic review of the compliance status of the project against the requirements of this approval;
 - provisions for periodic reporting of compliance status to the Director-General;
 - a program for independent environmental auditing at least annually, or as otherwise agreed by the Director-General, in accordance with *ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing*;
 - a program for compliance reporting and auditing for hazard related operational requirements; and
 - mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.

Independent Environmental Auditing

- 3.2 Within one year of the commencement of operation of the project, and then as may be directed or agreed by the Director-General, the Proponent shall commission an independent person or team to undertake an **Environmental Audit** of the project. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. The Audit shall:
- be carried out in accordance with *ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing*;
 - assess compliance with the requirements of this approval, and other licences and approvals that apply to the project;
 - assess the environmental performance of the project against the predictions made and conclusions drawn in the documents referred to under condition 1.1 of this approval; and
 - review the effectiveness of the environmental management of the project, including any environmental impact mitigation works.
- 3.3 An **Environmental Audit Report** shall be submitted to the Director-General within two months of the completion of the Audit, detailing the findings and recommendations of the Audit and including a detailed response from the Proponent to any of the recommendations contained in the Report.

The Director-General may require the Proponent to undertake reasonable works to address the findings or recommendations presented in the Report in relation to

compliance with this approval. Any such works shall be completed within such time as the Director-General may require.

Hazards Compliance and Auditing

- 3.4 Three months after the commencement of operation of the project, the Proponent shall submit a **Hazards Study Compliance Report** to the Director-General detailing compliance with conditions 2.10 and 5.4 of this approval. The Report shall include:
- a) dates of each hazards study, and commencement of construction and commissioning;
 - b) actions taken or proposed to implement the recommendations made in each hazards study;
 - c) responses to any requirement imposed by the Director-General under condition 1.3 with respect to each hazards study;
 - d) verification that the Emergency Plan required under condition 5.4a) is effectively in place and that at least one emergency exercise has been conducted;
 - e) verification that the Safety Management System required under 5.4b) has been fully implemented and that records required by the system are being kept;
 - f) certification by the Proponent that the each hazards study has been undertaken or prepared in accordance with the relevant Hazardous Industry Planning Advisory Paper;
 - g) certification by the Proponent that all recommendations in each hazards study have been implemented; and
 - h) certification by the Proponent that all safety systems have been implemented and are being maintained.
- 3.5 Within one year of the commencement of operation of the project, or within such further period as the Director-General may agree, the Proponent shall commission an independent person or team to undertake a comprehensive **Hazard Audit** of the project. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. The Hazard Audit report shall be submitted to the Director-General within one month of the completion of the audit. Hazard Audits shall be carried out at the Proponent's expense, and in accordance with the Department's *Hazardous Industry Planning Advisory Paper No 5 – Hazard Audit Guidelines* (DoP, 1991). Further audits shall be carried out every three years, or as directed or agreed by the Director-General, and a report of each audit shall be submitted to the Director-General for approval within one month of the completion of the audit.

4. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

Complaints Procedure

- 4.1 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (including construction and operation):
- a) a telephone number on which complaints about the project may be registered;
 - b) a postal address to which written complaints may be sent; and
 - c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the email address shall be advertised in a newspaper circulating in the locality on at least one occasion prior to the commencement of construction and six-monthly intervals thereafter until conclusion of construction works. The telephone number, the postal address and the email address shall also be provided on the website or dedicated web pages referred to under condition 4.3 of this approval.

- 4.2 The Proponent shall record details of all complaints received through the means listed under condition 4.1 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

- a) the date and time, where relevant, of the complaint;
- b) the means by which the complaint was made (telephone, mail or email);
- c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- d) the nature of the complaint;
- e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Director-General upon request.

Provision of Electronic Information

4.3 Prior to the commencement of construction of the project, the Proponent shall establish and maintain a new website, or dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to:

- a) information on the development and the current implementation status of the project;
- b) a copy of this approval;
- c) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project;
- d) a copy of each monitoring program and each environmental management plan required under this approval, or details of where a member of the public may inspect those documents;
- e) details of environmental performance of the project;
- f) details of the outcomes of reviews and audits of the project; and
- g) details of a contact point(s) to which community complaints or inquiries may be directed, including a telephone number, a postal address and an email address.

5. ENVIRONMENTAL MANAGEMENT

Environmental Representative

5.1 Prior to the commencement of site preparation works, the Proponent shall nominate a suitably qualified and experienced Environmental Representative(s) whose appointment is to receive prior approval of the Director-General. The Proponent shall employ the Environmental Representative(s) on a full-time basis, or as otherwise agreed by the Director-General, during construction of the project. The Environmental Representative shall be:

- a) the primary contact point in relation to the environmental performance of the project;
- b) responsible for all construction related Management Plans and Monitoring Programs required under this approval;
- c) responsible for considering and advising on matters specified in the conditions of this approval, and all other licences and approvals related to the environmental performance and impacts of the project;
- d) responsible for receiving and responding to complaints during construction in accordance with conditions 4.1 and 4.2 of this approval; and
- e) given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

The Proponent shall notify and seek the approval of the Director-General to any changes to that appointment that may occur during construction of the project.

Construction Environmental Management Plan

- 5.2 The Proponent shall implement the **Construction Environmental Management Plan** (CIA-WTP-CEMP-001, dated 28 August 2007), prepared by the Coffs Infrastructure Alliance throughout the construction of the project.

Operation Environmental Management Plan

- 5.3 An **Operation Environmental Management Plan** shall be prepared and implemented in accordance with the Department's publication *Guideline for the Preparation of Environmental Management Plans* (DoP, 2004) or its latest revision. The Plan shall include but not necessarily be limited to:
- identification of all statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all approvals, licences, approvals and consultations;
 - a description of the roles and responsibilities for all relevant employees involved in the operation of the project, including a management organisational chart illustrating the reporting relationships;
 - overall environmental policies and principles to be applied to the operation of the project;
 - standards and performance measures to be applied to the project, and a means by which environmental performance can be periodically reviewed and improved, where appropriate; and
 - management policies to ensure that environmental performance goals are met and operation complies with the conditions of this approval.

The Plan shall be submitted for the approval of the Director-General no later than one month prior to the commencement of operation of the project, or within such period otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General.

- 5.4 As part of the Operational Environmental Management Plan for the project required under condition 5.3 of this approval, the Proponent shall prepare and implement the following plans and documents:
- a comprehensive **Emergency Plan** detailing emergency procedures for the proposed water treatment plant. The plan shall include detailed procedures for the safety of all people outside of the project site who may be at risk from the development. The plan shall be in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 1, 'Industry Emergency Planning Guidelines'*; and
 - a document setting out a comprehensive **Safety Management System**, covering all on-site operations involving hazardous materials. The document shall clearly specify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to the procedures. Records shall be kept on site and shall be available for inspection by the Director-General or nominee upon request. The Safety Management System shall be developed in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'*.

6. ENVIRONMENTAL REPORTING

Incident Reporting

- 6.1 The Proponent shall notify the Director-General of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable and within 24 hours after the occurrence of the incident. The Proponent shall provide full written details of the incident to the Director-General within seven days of the date on which the incident occurred.

- 6.2 The Proponent shall maintain a register of accidents, incidents and potential incidents with actual or potential significant off-site impacts on people or the biophysical environment. The register shall be made available for inspection at any time by the independent qualified person or team conducting a Hazard Audit or Environmental Audit, the Director-General or nominee.
- 6.3 The Proponent shall meet all reasonable requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 6.1 of this approval, within such period as the Director-General may require.
-

MAJOR PROJECT ASSESSMENT:
Coffs Harbour Water Treatment Plant

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

September 2007

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1 EXECUTIVE SUMMARY

Coffs Harbour City Council (the Proponent) is seeking the Minister for Planning's approval for the construction and operation of a new water treatment plant (WTP) and transfer facilities to treat all potable water supply flowing to the Council's consumers from the existing Karangi Dam. The project site is in Karangi, about 11 km inland from Coffs Harbour, as shown in Figure 1.

Figure 1: Locality Plan



Council determined that a modern water treatment facility is needed because Coffs Harbour's existing drinking water supply does not always achieve the requirements of the *Australian Drinking Water Guidelines* (ADWG, 2004). Council also considered that the water quality risks would increase as further development occurs and/or increased use is made of its water resource areas (Orara River and Nymboida River), and as the potential poorer quality water from the future Shannon Creek Dam becomes progressively relied on in the future. The proposed design capacity of the WTP is up to 42 megalitres per day of treated water.

The Project is located wholly within the Coffs Harbour local government area and has a capital value of approximately \$32 million. An estimated 80 persons would be employed during the construction period, and 3 - 4 persons during the operation of the project. Construction of the project is expected to take 18 months.

A total of 10 submissions were received from the public exhibition of the Environmental Assessment. Half of these were from neighbouring properties who objected or raised issues about the project, and from local action groups who are opposed to the proposed fluoridation of the water supply. The rest of the submissions were from government agencies which generally endorsed the proposed environmental management measures in the Environmental Assessment. The Proponent's Submissions Report addressed the issues raised in the submissions.

The key issues raised in the submissions are:

- project justification – concerns about the need for the project and the proposed scale;
- site suitability and Ecologically Sustainable Development – perceived incompatibility of the proposed WTP with the rural character of the area and future agricultural and tourism value of the Coffs Harbour hinterland area;
- hazards and risks – concerns about the volume of chemical use and storage at the proposed facility and associated potential risks to the surrounding environment;
- construction noise – concerns regarding the prospect of construction noise for 18 months;
- visual impact – concerns about the cumulative visual impact of the proposal and the adjoining TransGrid Substation (completed in 2006), including potential impact on property values;
- traffic impact – concerns about visibility and vehicular safety of the access point to the site from Upper Orara Road; and
- water fluoridation – concerns about the safety aspects of fluoridation and the associated ongoing additional costs from this practice.

Following consideration of the Environmental Assessment, public submissions and associated reports, the Department is satisfied that the Proponent has sufficiently demonstrated the need for the project, including the appropriateness of the chosen water treatment system. The Department also considers that the overall impacts are likely to be minimal with the implementation of the recommended conditions, and the residual impacts of the project can be adequately managed and mitigated.

Recommended conditions of approval cover both construction and operational management issues, including compliance monitoring and auditing. Council has already prepared and submitted a Construction Environmental Management Plan, which details how construction impacts will be managed. The Department considers that the document adequately deals with management of construction stage issues.

The Department considers that the proposed fluoridation of the water supply is outside the scope of environmental assessment for the project and is essentially a matter between the Council and NSW Health, which regulates the fluoridation of public water supplies under the Fluoridation of Public Water Supplies Act 1957.

Approval of the proposed Coffs Harbour Water Treatment Plant is recommended subject to the implementation of the Proponent's Statement of Commitments and the Department's recommended Conditions of Approval.

2 BACKGROUND

2.1 Project Overview

The proposed water treatment plant (WTP) would treat all reticulated water supplies flowing to Coffs Harbour consumers from the existing Karangi Dam, which is supplied by inflows from both the Orara and Nymboida River Catchments. Shannon Creek Dam, currently under construction, is intended to augment the current water supply sources in the future. The Proponent envisaged that the quality of the raw water from these combined sources would fall below an acceptable standard for consumption from time to time. Thus, a catchment to tap water quality risk assessment was undertaken in 2006 on both the current and future raw water sources.

The risk assessment process identified high and very high risks from the continued use of water supplies from both the existing and future sources. These water quality risks were:

- cryptosporidium contamination from cattle, septic tanks and sewage treatment plant discharges;
- other micro-organisms from either chlorination failures and/or high turbidity;
- high turbidity events from various sources;
- poor water quality due to dissolved manganese and/or iron;
- contamination due to "chlorinated organics" (the by-products of the disinfection of organic matter through the use of chlorine); and
- taste and odour issues stemming from either blue green algal blooms in the source water or from variable levels of chlorine "residual" in the treated water.

A range of options for water treatment were considered in the context of the identified water quality risks, resulting in the selection of a dissolved air flotation-filtration (DAFF) plant followed by ultra violet and then chlorine disinfection. In conjunction with the DAFF process, powdered activated dosing (PAC) at the plant inlet is also proposed for control of algae related water quality hazards. Both the DAFF and PAC options were chosen over other options on the basis of lower capital and operating costs and proven effectiveness commensurate with the nature and level of the targeted risks.

The proposed site for the WTP at 140 Upper Orara Road, Karangi was selected from eight potential sites based on a number of selection criteria, including:

- proximity to the water supply;
- proximity to existing and relevant infrastructure (eg trunk main connecting Karangi Dam to Red Hill balance tanks);
- topographic characteristics of the site;
- environmental constraints;
- distance from built up areas; and
- minimal clearing and size/capacity of the site to provide adequate buffer to sensitive surrounding land uses.

2.2 Project Need and Justification

The Proponent considers that the current level of treatment is insufficient to guarantee a quality that meets the *Australian Drinking Water Guidelines* in terms of water quality risk management and for achieving all water quality guideline limits.

Extraction of water from the Orara and Nymboida Rivers is currently limited due to licence requirements from the Department of Water and Energy that ensures environmental flows are allocated before extraction is permitted. Once Shannon Creek Dam becomes fully operational, the water available from these two existing sources would reduce as they would be subject to greater environmental flow requirements. The Proponent's options regarding selective extraction (integral to the existing water treatment process) are therefore constrained and consequently, the option of not constructing a new water treatment facility has been discounted. The requirement for water treatment is expected to increase as the Coffs Harbour area becomes increasingly reliant on waters from the Shannon Creek Dam in drier years due to the expected poorer water quality from this source.

The objectives of the project, as stated in the Environmental Assessment, are:

- provide a state-of-the-art water treatment facility that provides drinking water to Coffs Harbour consumers that meets current *Australian Drinking Water Guidelines* at all times;
- achieve adequate risk management of the high and the very high water quality risks identified in the water quality risk assessment; and
- achieve NSW Health Department requirements at all times.

2.3 Existing Water Treatment

The existing water supply system servicing Coffs Harbour currently uses selective extraction to minimise turbidity in water diverted from the Orara and Nymboida Rivers. Aeration at Karangi Dam and selecting a near surface outlet is also used to minimise manganese levels in the outgoing water. The existing system also includes other water quality management processes such as lime/carbon dioxide dosing (for pH adjustment and pipeline corrosion control at Karangi Dam) and chlorination.

Aeration in Karangi Dam provides an initial treatment process to minimise undesirable levels of algae, manganese and iron in the water supply. However, due to the absence of an appropriate filtering process, this has resulted in Council being required to implement routine (approximately every three months) pipeline flushing works throughout the entire Coffs Harbour reticulation system.

3 PROPOSED DEVELOPMENT

3.1 Approval Sought

The proposal involves the construction and operation of a filtered drinking water treatment plant (WTP) within a 3.5 hectares site at 140 Upper Orara Road, Karangi . The WTP has been designed to operate for 22 hours at 42 megalitres per day during peak demand periods in 2030 and would operate for shorter periods during the immediate future and lower demand periods. The Proponent intends to provide for future expansion in the plant's capacity via future addition of additional process units, if and when required. **Figures 2 and 3** illustrate the overall WTP site layout and aerial impression of the plant facility.

The proposed WTP would treat all potable water supplies flowing to Coffs Harbour consumers from the existing Karangi Dam, which is currently supplied with waters from both the Orara and Nymboida River catchments. In the future, the flows would be augmented with supplies from the Shannon Creek Dam, currently under construction at Coutts Crossing, south west of Grafton.

Figure 2: Water Treatment Plant Site Layout

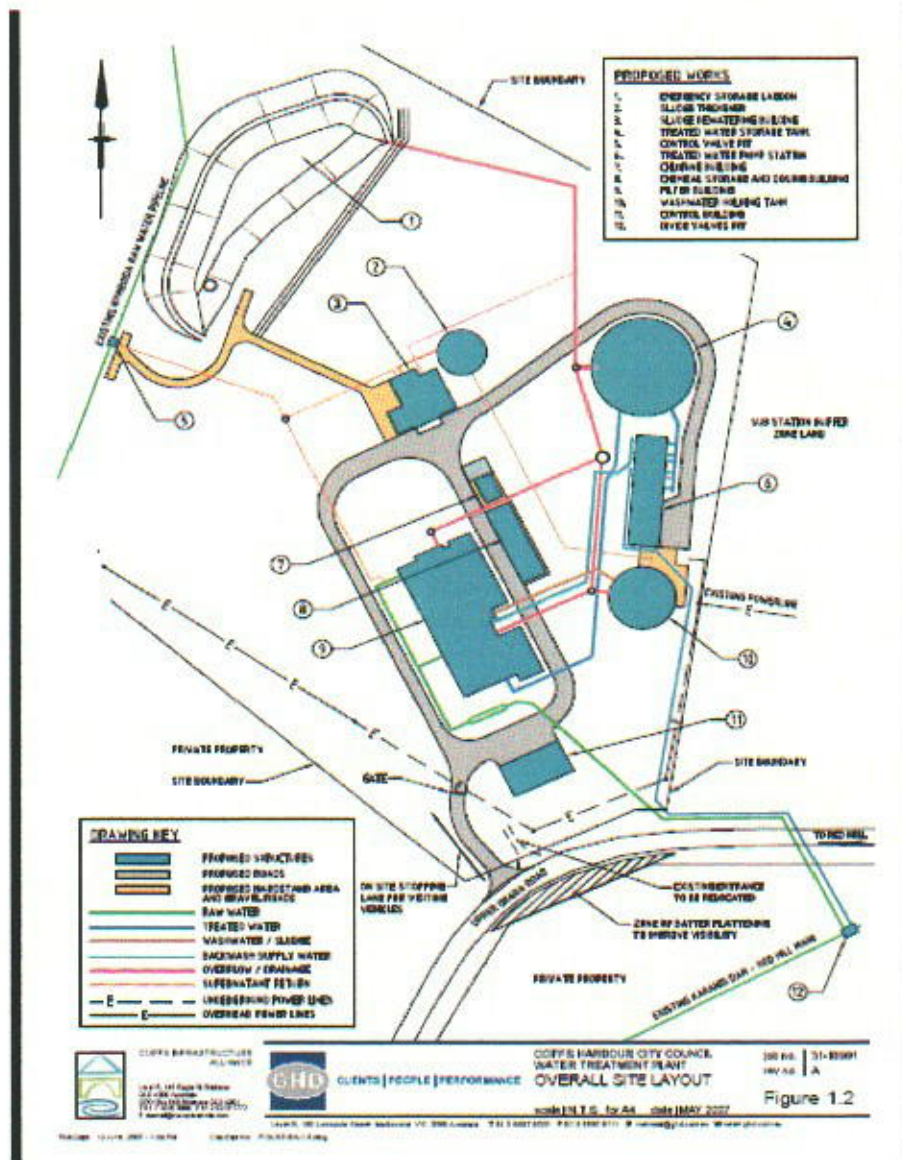
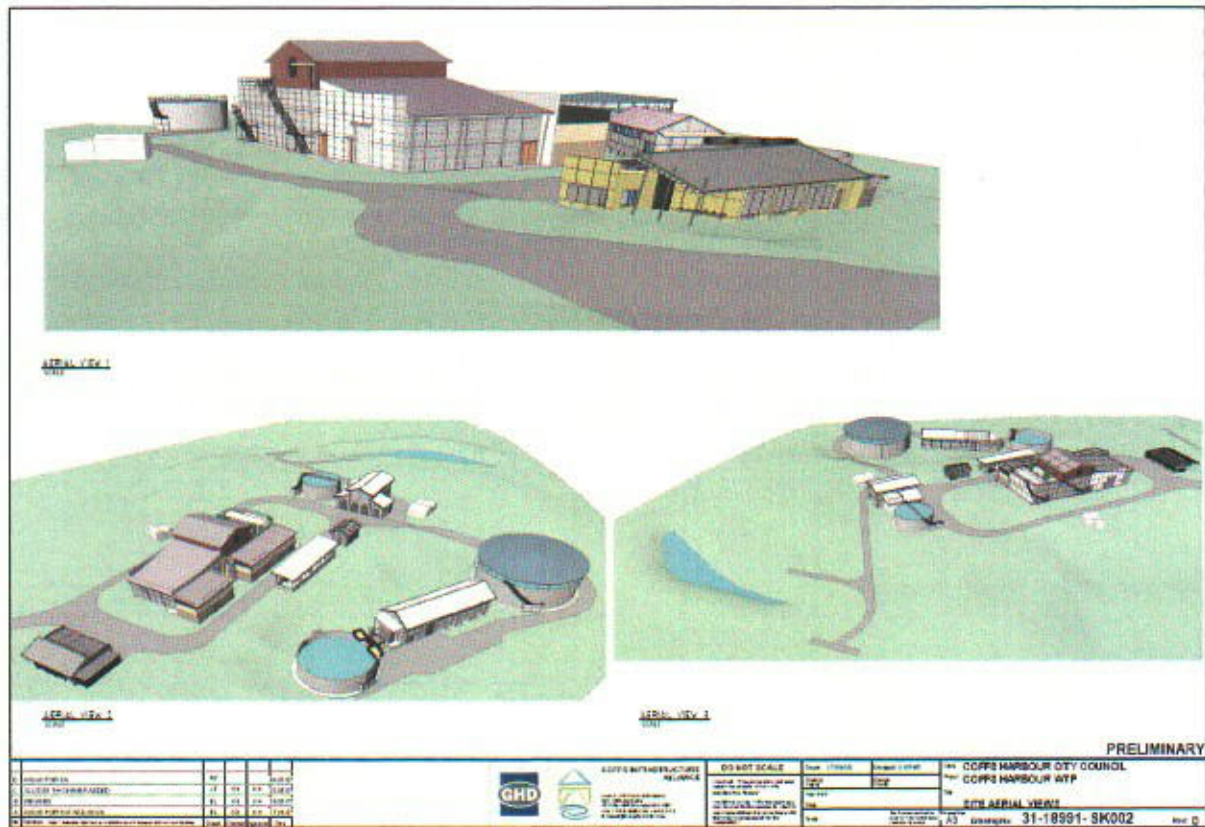


Figure 3: Water Treatment Plant Aerial Impression



Construction of the WTP, including transfer and delivery facilities would take 18 months and involve the following components:

- supply and return pipelines to the proposed WTP via a connection to the existing Karangi Dam to Red Hill Balance Tanks main;
- new lime dosing facilities at the project site should the existing lime dosing facilities on the Karangi Dam site be abandoned;
- relocation of the existing carbon dioxide dosing facilities from the Karangi Dam site to the project site;
- modifications to the Karangi Dam outlet pumping station to enable pumping of raw water to the proposed WTP inlet;
- dissolved air flotation and filtration (DAFF) treatment plant incorporating above-ground concrete water retaining structures;
- facilities for washwater recycling, sludge thickening and sludge dewatering;
- above ground tanks for treated water storage (5.8 megalitres) and washwater storage (1.5 megalitres);
- earth walled emergency storage containment lagoon to provide for the (unlikely) event of a plant overflow or sludge dewatering system failure;
- combined control building, testing laboratory and meeting room;
- treated water pump station to transfer treated water to the existing Red Hill tanks;
- provision of a range of chemical storage and dosing facilities for treatment of the raw water;
- provision of chlorination and ultra-violet disinfection facilities for the filtered water;
- provision of fluoridation facilities for the filtered water; and
- possible future ozone and granular activated carbon (GAC) treatment process downstream of the DAFF process if water quality deteriorates further due to future development in the catchments.

All water is currently transferred through the Karangi Dam storage which provides an important water quality barrier. This would continue to be the case for the proposed WTP and for the future water supply from Shannon

Creek Dam which will be routed by pipeline to Karangi Dam. However, bypassing of Karangi Dam would be an operational option at all times to cater for any emergencies.

Although the WTP has been designed to treat the water supply on its own to meet the water treatment performance targets contained in Table 5.3 of the Environmental Assessment, the Proponent would continue to use other safeguards available which include selective extraction of water supply and detention at Karangi Dam. The proposed targets satisfy water quality risk and water quality guideline requirements in the ADWG (2004).

No change is proposed to the volume of water being extracted from the various water sources as a result of the proposal. The actual output of the WTP would be dependent on the daily water demand as it is with the existing system.

3.2 Amendments to the Proposal

Minor changes were made to the proposal following the public exhibition of the Environmental Assessment. The changes generally involve adjustments to site plans and WTP operating system, as follows:

- various changes to plant design and operation that were recommended by the Major Hazards Unit of the Department of Planning, as documented in the Submissions Report;
- relocation of the sludge thickening tank from the eastern to the western side of the sludge dewatering building to avoid the removal of two hoop pines;
- relocation of an existing large shed to the eastern side of the sludge dewatering building;
- relocation of the security fence along the western boundary to three metres inside the site boundary to allow for screen planting between the boundary and the security fence;
- retention of camphor laurel trees that are currently providing screening of the TransGrid substation and associated electricity poles and towers until native plantings grow to a sufficient height. Some modification to the earthworks design would be required to retain these trees; and
- updating of the Statement of Commitments contained in Table 8.1 of the Environmental Assessment to reflect additional commitments resulting from community and stakeholder consultation.

4 STATUTORY CONTEXT

4.1 State Environmental Planning Policy (Major Projects) 2005

The Director-General, as delegate of the Minister for Planning, formed the opinion on 10 November 2006 that the Coffs Harbour Water Treatment Plant is a project to which Part 3A applies, as the project falls within Schedule 1, Group 8 and Clause 25 of the *State Environmental Planning Policy (Major Projects)*. This is due to the development being for the purpose of a water treatment works that has a capital investment value of more than \$30 million for drinking water supply.

4.2 Permissibility

The proposed development is located within the Coffs Harbour local government area and is subject to the provisions of the Coffs Harbour City Local Environmental Plan (LEP) 2000. The land is zoned 1A Rural Agricultural wherein the proposal, a "utility installation", is permissible.

4.3 Other Relevant Environmental Planning Instruments

A number of environmental planning instruments are directly relevant to the project and were considered in the Environmental Assessment. These instruments include:

- North Coast Regional Environmental Plan;
- State Environmental Planning Policy No 33 – Hazardous and Offensive Development;
- State Environmental Planning Policy No 44 – Koala Habitat Protection; and
- State Environmental Planning Policy No 55 – Remediation of Land.

4.4 Public Exhibition of the Environmental Assessment

The Department exhibited the Environmental Assessment in accordance with Section 75H(3) of the Environmental Planning and Assessment (EP&A) Act 1979 from 21 June 2007 until 23 July 2007 with 10 submissions received. The Proponent's responses to submissions are contained in the Submissions Report (see Appendix B to this report) which was received by the Department on 8 August 2007.

4.5 Director-General's Requirements

The Director-General's requirements for the preparation of an Environmental Assessment were issued on 18 December 2006. For the purpose of Section 75I(2)(g) of the EP&A Act 1979, the Environmental Assessment for the project complied with the Director-General's requirements on its second submission and the Proponent was notified of this compliance on 17 June 2007.

5 CONSULTATION AND ISSUES RAISED

5.1 Submissions Received

A total of 10 submissions were received from the public exhibition of the Environmental Assessment, as summarised in Table 1. The issues raised in the submissions are summarised in Table 2.

Table 1: Summary of Submissions Received

Submissions type	No of submissions
Government agencies <ul style="list-style-type: none"> • Department of Environment and Climate Change (DECC) – two submissions from Waters and Catchment and Aboriginal Heritage Units • Department of Primary Industries (Fisheries) • NSW Health (North Coast Area Health Service) 	4
Community groups	2
Individuals	4
Total	10

Three of the four individual submissions were from affected residences which either objected to, or raised concerns about the proposal. Submissions from the community action groups objected to the proposed fluoridation of the water supply. Submissions from government agencies generally endorsed the proposed environmental management measures contained in the Environmental Assessment.

Table 2: Summary of Issues Raised in Submissions

Issues	Details
Project Justification	<ul style="list-style-type: none"> • justification of the need for the project and the proposed scale of the project.
Site Suitability and Ecologically Sustainable Development (ESD)	<ul style="list-style-type: none"> • unsuitability of the site for the project and non-compliance with standards for ESD. • incompatibility of the proposed WTP with the rural character of the area and with future agricultural and tourism values of the Coffs Harbour hinterland area. • inadequate buffer zone to the Orara River. • the restrictive nature of the site prohibits the use of sludge drying beds. The plant has thus been designed with mechanical dewatering of wash water which is a capital and energy intensive design option. • need to select an alternative site that maintains land use compatibility, achieves ESD and has a lower risk of environmental impacts.
Hazards and Risks	<ul style="list-style-type: none"> • environmental threat posed by the project due to its intensive use and storage of chemicals. • potential contamination of the environment, including the Orara River which presents a significant and/or irreversible impact on the environment.
Noise Impact	<ul style="list-style-type: none"> • concerns regarding the prospect of construction noise for 18 months, and also with ongoing noise during the operation of the WTP.
Visual Impact	<ul style="list-style-type: none"> • concerns about the cumulative visual impact of the proposed WTP and the adjoining TransGrid Substation (completed in 2006) directly opposite a landowner's property, including the potential impact of these industrial installations on property values.
Traffic Impact	<ul style="list-style-type: none"> • safety concerns regarding the access point to the site at the apex of a blind corner of Upper Orara Road that has been the site of many

	<p>accidents. Need to upgrade this section of the road before commencing the project.</p> <ul style="list-style-type: none"> concerns about the significantly increased volume in traffic movements during construction and the impact this would have on people who regularly use the road. 	
Heritage	<ul style="list-style-type: none"> apparent contradiction between the initial report recommendations and the final version of the summary report. There seems to be no real attempt to try and preserve heritage, with no conservation options being put forward. 	
Flora and Fauna	<ul style="list-style-type: none"> concerns about damage to flora and fauna arising from potential chloride or chemical spill to Orara River as there are many bush turkeys and livestock that drink from the river as well as native fish and turtles. a neighbouring land owner seeks assurance that none of the trees (Cadagi gums) lining Upper Orara Road opposite the site will be damaged in the reshaping of the road embankment. 	
Fluoridation and Community Consultation	<ul style="list-style-type: none"> the lack of promotion of the project by the Council and the lack of appropriate reporting from the local media have made it difficult for the residents of Coffs Harbour to find out about the project. fluoridation goes against existing community views and the precautionary principle. Council has not carried out an adequate consultation process on the introduction of fluoride to the Coffs Harbour water supply. Fluoridation is an unsafe, unproven and unethical practice. the cost of the fluoridation units which form part of the WTP have not been made available. Coffs Harbour's ratepayers are entitled to know that not one cent of ratepayer funds will be spent contributing to the capital costs of the fluoridation plant. 	

6 ASSESSMENT OF ENVIRONMENTAL IMPACTS

6.1 Project Justification

Issues

The Proponent conducted a water quality risk assessment which identified potential high risks to consumers from the continued use of water supplies from both the existing sources (Orara and Nymboida River catchments) and a future source, Shannon Creek Dam, which is presently under construction. The risks relate to the land uses within each of the catchments being cattle grazing, agriculture, residential areas, sewage treatment plants, etc. The major potential risks identified were:

- cryptosporidium contamination from cattle, septic tanks and sewage treatment plant discharges;
- other micro-organisms from either chlorination failures and/or high turbidity;
- high turbidity events from various sources;
- poor water quality due to dissolved manganese and/or iron;
- contamination due to "chlorinated organics" (the by-products of the disinfection of organic matter through the use of chlorine); and
- taste and odour issues stemming from either blue green algal blooms in the source water or from variable levels of chlorine "residual" in the treated water.

Submission

One private submission, on behalf of Fluoridation Is Not Democratic (F.I.N.D), a local action group opposed to water fluoridation, questioned the need for the project, as well as the proposed scale. Specifically, the submission questioned the following:

- in what areas does the current drinking water supply fall below the Australian Drinking Water Quality Guidelines?
- where is the proof that water from Shannon Creek will deliver inferior quality?
- are the potential water quality hazards serious enough to warrant an immediate health warning for Coffs Harbour residents?
- how are the key objectives of the WTP proposal met?;
- only 15 megalitres of water currently services Coffs Harbour 67,000 population whereas the proposed capacity of the new WTP (42 megalitres per day) could conceivably cater for 188,000 people, and noting that the projected population for the local government area is 91,800 in 2031.

Consideration

The Proponent's justification for a new water treatment facility for Coffs Harbour was discussed in section 2 of this report. A summary of typical water quality and risks from Coffs Harbour's existing and future water sources was presented in Figure 5.1 of the Environmental Assessment.

In response to the above questions, the Proponent indicated that the current water supply does not meet the *Australian Drinking Water Guidelines* (ADWG) because it falls below the guidelines' aesthetic requirements (colour, taste and odour) primarily due to high iron and manganese levels which cannot be removed from the water using the existing treatment methods. Currently, the water quality of Karangi Dam has not been adversely affected partly due to the practice of selective extraction (not sourcing water after heavy rainfall when the water is turbid and containing contaminants from runoff) and also due to no water being drawn from Shannon Creek Dam. However, the water quality risks are expected to increase when Shannon Creek becomes operational as more stringent environmental flow requirements would then apply to the Orara and Nymboida Rivers that would reduce water extraction from these cleaner, existing sources.

The 'proof that Shannon Creek Dam will deliver an inferior water quality is predicated on the catchment to tap risk assessment conducted by the Proponent's key water management personnel in consultation with external stakeholders. The assessment found that the dispersive soils and land uses in the catchment of this dam would

have the effect of increasing turbidity and the likelihood that pathogens could be shielded from the existing disinfection process.

The Proponent argued that the development of the project demonstrates that it has been able to plan in advance and avoid the prospect of issuing the Coffs Harbour residents with a health warning. The plant has been designed to treat the raw waters to a standard that would be acceptable to consumers in terms of no adverse health effects and no colour, taste or odour (aesthetic) issues. The proposed treatment process (dissolved air flotation - filtration followed by ultra-violet disinfection and then chlorination) would result in the achievement of the key objectives of the proposal.

The Department acknowledges that the selected treatment process is an established technology with known consequences and effects that would produce water quality that meets the ADWG. The Department also acknowledges the importance of good planning in advance such that potential water quality risks are avoided and the issue of health alerts or notices should not happen.

In relation to the proposed processing capacity of the plant relative to the population numbers it would cater to, the Proponent indicated that the 188,000 figure cited by the submitter has been calculated using incorrect information. Although the current population of Coffs Harbour is 67,000, the number of people currently connected to the distribution system is approximately 61,050 who use between 15 and 25 megalitres per day of drinking water. When the higher usage rate is interpolated, a 42 megalitres per day design capacity would cater for approximately 102,500 people. The WTP needs to be adequately sized to accommodate the peak daily demand times and not the average daily demand, and also to cater for the expected population of 91,800 in 2031. The processing capacity has been selected to cater for this future population with an additional amount to allow for potential errors in any projections. The capital cost associated with the installation of extra capacity now would be significantly less than having to mobilise a second construction team at a later stage. The Department considers these arguments to be reasonable and justified.

The Environmental Assessment indicated the possibility that the plant's processing capacity may be increased in the future, should it be required, with space provided on site to accommodate additional processing units. A condition is recommended setting the processing capacity of the plant to 42 megalitres per day, as proposed in the Environmental Assessment. Should the plant's capacity be increased in the future, this may require a modification of the project and associated test of consistency and/or environmental assessment process.

In conclusion, the Department considers that the Proponent has sufficiently justified the need for and scale of the project, and the appropriateness of the proposed treatment process to achieve the project objectives.

6.2 Site Suitability and ESD

Issues

A submission from an adjacent residence expressed concerns that the proposed WTP is prohibited under the Rural 1A Agriculture zoning of the site, is considered a hazardous and/or offensive development under SEPP 33, and would cause a severe land use conflict. The submission also claims that the project does not comply with standards for Ecologically Sustainable Development (ESD) on the following grounds:

- environmental threat – the proposal involves intensive use and storage of chemicals with potential to contaminate the local environment, including the Orara River;
- excessive environmental footprint – risk mitigation and the topographical characteristics of the site have resulted in additional life cycle costs and energy usage;
- mechanical dewatering of the sludge – the restrictive nature of the site prohibits the use of sludge drying beds, and thus mechanical dewatering has been adopted which is a capital and energy intensive option;
- hydraulic energy losses – the proposed site at 115m ADH has low elevation relative to the Karangi Dam (144m AHD) and Red Hill balance tanks (135 m AHD), resulting in significant hydraulic energy loss from Karangi Dam down to the WTP. The subsequent pumping of treated water from the WTP back up to the trunk main and Red Hill balance tanks will result in substantial energy usage and greenhouse emissions.

Consideration

The project site is a largely cleared area, surrounded by a small number of residential dwellings. A map of the adjacent residential areas is shown in **Figure 5**. The site was selected following consideration of eight potential sites (including the Karangi Dam site), using a number of selection criteria or 'desirable outcomes'. It was assessed to be the most preferable site based on social, environmental and financial aspects of each location. Among the key attributes of the site are proximity to Karangi Dam (700-800 m to the south-west) and existing pipelines, elevation above flood prone areas, minimal clearing and minimal impacts on neighbours. Other sites were considered to have a high environmental risk. Section 6.3 of the Environmental Assessment provides a summary of the findings of the site options analysis.

The Proponent considers that the proposed WTP is not incompatible with the surrounding residential development, including the nearby Orara River (zoned Environmental Protection), on the following grounds:

- the proposal is classified as a "utility installation" under the Coffs Harbour City Local Environmental Plan (LEP) 2000 and is a permissible use under the site's 1A Rural Agriculture zoning;
- any impacts on the rural character of the area would be mitigated through a plant design sympathetic to its setting and with proposed tree planting and landscaping works. A 50 metre buffer (at the closest point) between the WTP and the Environmental Zone would be maintained; and
- although there would be some construction impacts such as noise and traffic, the operation of the plant would have low or negligible impact in terms of noise, odour and traffic. The plant will operate on a zero discharge basis (no discharges to Orara River) and all chemicals will be used and stored in accordance with standard procedures to contain any spill or release.

Once built, the WTP would obviously be a dominant feature of the area along with the nearby TransGrid substation and alter the outlook of the area. Extensive tree planting and retention of several trees are proposed by the Proponent to provide strategic visual screening of the plant and reduce its visual impact. The Department envisages that the proposed landscaping once sufficiently established would screen the plant from the roadside and affected residences. The visual impact of the proposal is discussed in Section 6.4 of this report.

Regarding concerns about the potentially hazardous nature of the facility, a detailed assessment of potential risks from the operation of the plant was conducted via a Preliminary Hazards Assessment (PHA). The PHA concluded that the operation of the plant would meet the three measures of risk under the NSW land use safety regulations (ie individual fatality, individual injury, and individual irritation risks). Hazards and risks are further discussed in Section 6.5 of this report.

Given the above considerations, the Department is confident about the suitability of the site for proposed WTP and considers that the project is not incompatible with the surrounding rural residential environment.

In response to the resident's concerns that the proposed facility does not comply with ESD standards, the Proponent, in its Submissions Report, stated that:

- all of the proposed construction and operational processes are established and well recognised and any spills likely to contaminate the environment can be adequately managed through established methods. Accordingly, the Proponent considers that the proposal would be consistent with the precautionary principle;
- the use of sludge drying is preferred over mechanical dewatering due to higher construction, installation and operating costs and greenhouse gas emissions of mechanical dewatering. The decision not to utilise sludge drying beds was not based specifically on the site constraints but on the regional constraint of high humidity. The high humidity levels in the Coffs Harbour region have the potential to increase the time required to adequately dry sludge from hours or days to years and would not be an operational alternative.
- the potential hydraulic energy loss was an important factor in the selection of the most appropriate site. Water is currently required to be pumped from Karangi Dam to the Red Hill balance tanks. The proposed option of gravity feeding water from Karangi Dam to the project site and then pumping to the Red Hill balance tanks is not significantly different from the existing situation. The slight difference in energy consumption between the Dam site and the proposed WTP site was more than outweighed in the triple bottom line analysis by the other selection criteria.

The Department accepts the validity of the Proponent's response and considers that the proposal is not inconsistent with ESD principles (Precautionary Principle, Intergenerational Equity, Conservation of Biological Diversity and Ecological Integrity, and Improved Valuation and Pricing of Environmental Resources) in that:

- the proposed management measures would satisfactorily protect the environment during both the construction and operational phases of the project;
- the technology adopted for the WTP is an established technology for water treatment, thereby reducing the potential for unknown impacts;
- there would be no significant impacts on threatened or endangered species as a result of the proposal; and
- there are no identified long term impacts that would result in degradation of the environment.

6.3 Noise

Issues

The noise modelling in the Environmental Assessment predicted that construction noise impact would exceed the relevant DECC construction noise criteria at the identified sensitive receivers. The nearest receivers are five residential dwellings located to the west and south of the project site. The closest property is 100 metres away from the site, and the others are between 180 - 270 metres distant. Other rural residential dwellings are approximately 2 km to the east.

Two of these residences raised concerns about the prospect of noise during the 18 months construction period, and also during the operation of the WTP.

Consideration

The noise impact assessment was conducted in accordance with relevant DECC guidelines and noise levels were predicted for both the construction and operational phases of the project. A Computer Aided Noise Abatement (Cadna-A) program was used for the calculation and assessment of noise exposure and propagation.

Construction Noise

Noise monitoring was undertaken day, evening and night over an eight-day period at two representative locations near the project site to establish background noise levels. Construction noise criteria were established (based on the *Environmental Noise Control Manual*) using the measured background noise levels and applying a conversion factor based on the expected duration of the construction period. Since this period is expected to take longer than 26 weeks, 35 dB(A) was adopted as the construction noise goal (background noise level of 30 dB(A) + 5 dB(A)). The project site is located in an area that typically has very low background noise and this is reflected in the construction noise objective established for the project.

A worst case noise scenario from the construction activities was assessed whereby:

- noise was modelled with all the machinery operating at full power at the same time;
- the machinery was assumed to be operating within construction areas located closest to the sensitive receivers; and
- the dominant high noise generating machinery (grader and scraper) are proposed to be used during the initial 8 week period for earthworks and clearing, but would not be used throughout the entire construction period.

The noise assessment predicted significant exceedances of the adopted noise objective by as much as 20 d(BA) at the closest receiver, this being the property at 146 Upper Orara Road.

Table 3: Construction Noise Levels at Nearest Receivers

Receiver Location and distance to project site	Calculated Noise level (dBA)	Construction Noise Objective (dBA)
R1 - approx. 100 m southwest	55	35
R2 - approx. 270 m south	48	35
R3 - approx. 80 m southwest	49	35
R4 - approx. 190 m southeast	50	35
R5 - approx. 220 m southwest	50	35

Source: Table 7.6 of the Coffs Harbour WTP Environmental Assessment.

The Department recognises that the noise predictions are conservative, based as they were on a worst case scenario. The worst case construction noise impacts are likely to occur during the initial 8 week period for earthworks and clearing when various types of noisy equipment are likely to be operated simultaneously. In practice, equipment being used simultaneously at full power is only likely to occur for very short periods. Additionally, the equipment will move around the site and this would reduce the impacts on any one receiver. The net result is that any noise exceedance, if it occurs, is likely to be short lived.

To ensure that construction noise impact would be minimal, the Proponent has committed the following measures, as reflected in its Statement of Commitments and CEMP:

- ensure that all workers are made aware of the potential noise impacts for local residents and encouraged to minimise noise during the course of their activities;
- maintain all construction equipment in good condition with all combustion engine plant to be fitted with residential grade exhaust silencers;
- minimise movements; and
- keep the neighbouring residences informed of the construction program throughout the construction period.

The Department is satisfied that the noise impacts during the construction period would be limited and within acceptable bounds with the implementation of best practice measures and prompt response to neighbours' reasonable concerns.

Operation Noise

The operational noise assessment was conducted in accordance with DECC's *Industrial Noise Policy*. The noise modelling was based on 24 hour operations and considered topography, weather conditions, reflection, ground absorption, site sources and the location of the receiver areas to predict received noise levels from the proposed WTP. A number of modelling scenarios with differing meteorological and operational conditions were conducted. This included a worst-case scenario where all noise sources are to operate continuously at any one time and there is no structure over the rapid mix and flocculator tanks with wind towards the southwest in the direction of the closest residential receiver. The results of this scenario, illustrated in **Figure 4**, indicated that the sound levels at the nearest receivers would be in the range of 23–31 dB(A). Based on this modelling, the Environmental Assessment concluded that the operational noise is unlikely to exceed the project specific noise goal of 35 dB(A).

Figure 4: Operational Noise Assessment

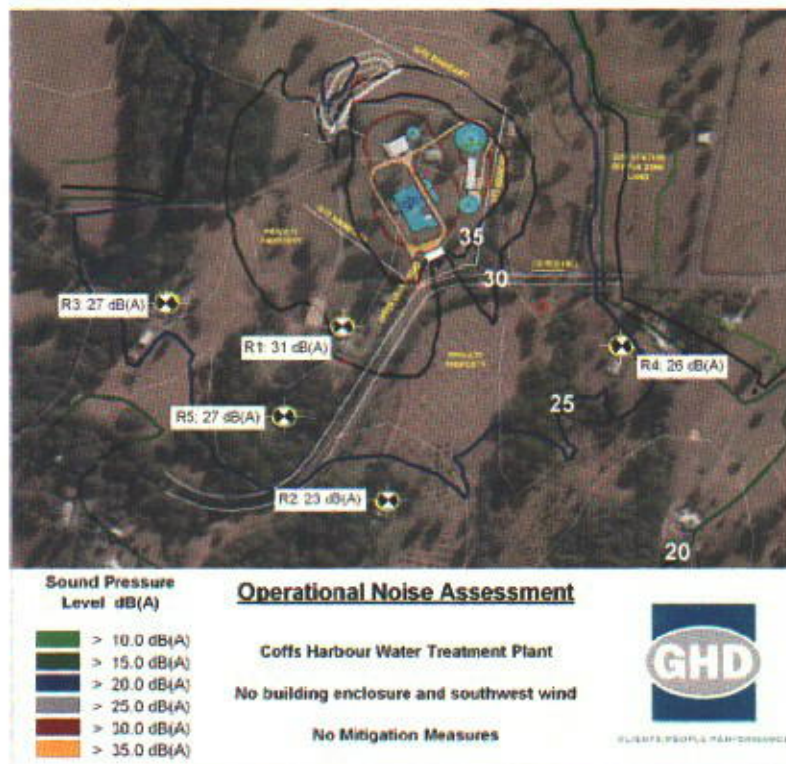


Figure 11 Scenario 6 Noise Contours

The Proponent's Statement of Commitments indicated that all noise sources will be located within buildings and acoustically treated rooms to provide the noise attenuation modelled in the noise impact assessment. The conservative nature of the noise modelling and the application of this mitigation measure would ensure that operational noise would not be an issue for the adjacent residences. The Department is satisfied that operational noise would be low and would meet the project's adopted operational noise goal.

To ensure that operation noise from the new WTP does not exceed 35 dB(A) at the nearest and most affected property boundary, the Department recommends a condition that requires the plant to not exceed this noise goal for the life of the project. Noise monitoring is required to be undertaken in accordance with Section 11.1 - Monitoring Environmental Noise of the *NSW Industrial Noise Policy*.

6.4 Visual Impact

Issues

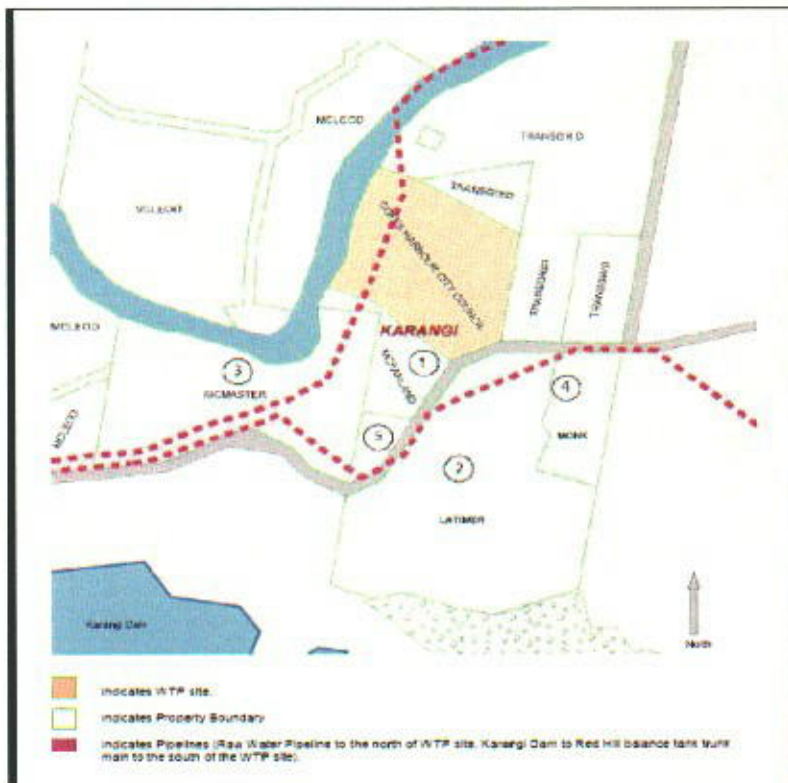
Five residential dwellings are located along Upper Orara Road with varying proximity to the project site. The nearest dwelling (No 146 Upper Orara Road) lies approximately 100 metres southwest of the site.

One neighbouring residence expressed concerns at the cumulative visual impact of the proposed facility and a recently constructed TransGrid substation at Casuarina Lane. A related concern is the transformation and domination of this rural setting with industrial type installations, including potential impact on future agricultural and tourism values of the Coffs Harbour hinterland area.

Consideration

The visual impact assessment undertaken in the Environmental Assessment identified the potentially affected properties (as shown in **Figure 5**), considered the existing views to the project site, the visual character of the surrounding landscape, sensitivity of the landscape to alteration by the proposed facility, visual character and extent of the facility, and 'viewer-sensitivity' to alteration of the existing visual environment by the project.

Figure 5: Locality of Adjacent Residences



The neighbouring properties were visited by the consultants to assess the presence or absence of views from each property to the project site. Where views to the project site exist, the views were assessed against a set of criteria which include:

- that the construction phase of the project should not cause any long-term visual impacts (ie visual impacts that would continue to exist after the construction of the WTP and associated infrastructure);
- that the WTP facility should not interrupt the view from any public location or nearby property towards any landscape feature;
- that the WTP facility should not detract from the visual amenity of an important visual or cultural element, or landscape;
- that the WTP facility should be of a scale that is appropriate to the setting, when viewed from a nearby property or a public location; and
- that the WTP facility should be constructed of materials and comprise only built forms that are sympathetic to the surrounds.

The view from the roadways at Upper Orara Road and Casuarina Lane were also assessed. **Table 4** provides a summary of findings for affected properties and public locations based on the above criteria.

Table 4: Visual impact rating

Viewing Site	Potential Impact
Upper Orara Road	Medium impact
Casuarina Lane	No impact
146 Upper Orara Road, Karangi	Medium impact
147 Upper Orara Road, Karangi	Low impact
186 Upper Orara Road, Karangi	Medium impact
121 Upper Orara Road, Karangi	Low impact
156 Upper Orara Road, Karangi	No impact

Of the surrounding properties, only two (Nos 146 and 186 Upper Orara Road) were identified as having partial views to the project site and would experience medium visual impact. **Figures 6 and 7** provide a visual impression of the proposed WTP from these properties. The Department notes that for No 146, the illustrated views of the plant are from within the property but not from the house itself where existing trees provide a screen of the plant site.

The remaining properties were assessed to experience either no impact or low impact because of existing vegetation which restricts views to the site. However, it was noted in the Environmental Assessment that at Nos 147 and 121 Upper Orara Road, the existing screening includes deciduous trees which would render the WTP visible during winter months.

In response to concerns about the project's impacts on the rural character and future agricultural and tourism values of this hinterland area, the Proponent indicated that any impacts would be mitigated by architectural design and landscaping and implementation of all reasonable and practical measures. It was noted that the site has not been used for any substantial use since it was subdivided in 1986. The Proponent considers that the site's removal from grazing/dairy use would not significantly reduce Orara Valley's ability to provide agricultural services, and impact on tourism values would be negligible given the site's location away from National Parks and accounting for the proposed landscaping of the facility and expected low operational impacts.

To minimise the visual impact of the proposal from affected properties and surrounding rural landscape, the Proponent in its Statement of Commitments has proposed:

- the retention of certain trees (some camphor laurels and hoop pines) such that a view towards the substation site and some electricity poles and towers would not be opened;
- the installation of screen planting early in the development stage along the length of the western and southern boundaries (excluding the site entrance on the southern boundary). This may not reduce the visual impact on properties at 146 and 186 Upper Orara Road in the short term, but would be effective in the long term;
- providing screen planting comprising of trees, shrubs and ground cover to create a dense visual barrier;

- the planting of native vegetation between properties at 121 and 147 Upper Orara Road and the project site to provide ongoing visual screen of the facility from these properties; and
- the use of muted colours for the southern WTP buildings to minimise potential bulk of the buildings.

Figure 6: View of WTP from 146 Upper Orara Road (looking east)



Figure 7: View of WTP from 186 Upper Orara Road (looking east)



The Department considers that the visual illustration of the project in the Environmental Assessment provided only a basic impression of the design and appearance of the proposed facility. It also notes that none of the submissions commented on the architectural design and appearance of the plant. Based on the photomontages, there could be some impacts and therefore the Department requires further work to reduce such impacts. Conditions are recommended requiring the Proponent to prepare and submit an Urban Design and Landscaping Plan for the Director-General's approval before construction commences. The Plan is to be prepared in consultation with affected landowners and must contain details of the built elements (including proposed treatments, finishes, materials and colour of exposed surfaces) and landscape elements, including the timing and progressive implementation of the landscaping works.

The Department considers that the proposed plant would be a dominant built element in its rural setting, but with a sympathetic design and adequate landscaping, the facility should not detract from the visual amenity of the existing landscape. Once the proposed landscaping is sufficiently established, the facility should integrate well into its rural environment.

There would be a visual impact from construction activities for a few properties over an 18 month period. While this period is significant, the Department considers that impact should be not be unacceptable given its temporary nature and Council's commitment to accommodate residents concerns and individual needs during the construction period.

6.5 Hazards and Risk

Issues

The proposed water treatment process involves the use and storage of a range of potentially dangerous and hazardous materials. These include chlorine gas, powdered activated carbon and the combined storage of class

8 dangerous goods (sodium hydroxide, fluorosilicic acid, lime). A preliminary risk screening conducted by the Proponent determined that the proposed quantities of these goods would exceed the screening thresholds under SEPP 33 – Hazardous and Offensive Development. Consequently, a Preliminary Hazard Assessment (PHA) was undertaken to assess in detail the potential risks associated with the proposal.

A transport risk screening was also conducted to examine all movement of dangerous goods into and out of the project site. This screening determined that the number of generated traffic movements involving significant quantities of hazardous materials does not warrant a route evaluation study.

A submission from the nearest affected residence expressed concerns about the high volume of chemical use and storage and the risk this poses to the surrounding environment.

Consideration

The PHA identified potential hazards from the proposal and developed scenarios that could credibly have an offsite impact to public safety or the environment. It was determined that only a chlorine release incident resulting in a toxic cloud could generate public safety hazards extending beyond the site boundary.

Chlorine release scenarios (means of release, dispersion, toxic effect calculations, likelihood of occurrence) were modelled and assessed. This process concluded that the proposed WTP will meet the NSW land use safety criteria, predominantly that:

- the individual risk of fatality at the nearby residential dwellings is less than 1 in a million per year;
- the risk of injury at residential areas does not exceed 10 in a million per year; and
- the risk of irritation at residential areas does not exceed 50 in a million per year.

The Department has reviewed the PHA which demonstrated that the NSW published risk criteria relevant to the land uses in the vicinity of the site were not exceeded. The proposal is therefore acceptable with regard to hazards related aspects. However, clarifications were sought from the Proponent in relation to the operation of the chlorination system and the safety measures proposed. The technical clarifications are considered satisfactory. The response from the Proponent included a revised plant arrangement (documented in the Submissions Report) which will further reduce offsite risk.

To ensure that safety is optimised at the design stage and also to ensure the ongoing safe operation of the plant, the Department recommends conditions of approval that require the preparation of hazard-related studies and plans for the approval of the Director-General before construction of the project is commenced and also before the plant is operated. A Hazard and Operability Study and a Final Hazard Analysis (should there be changes to the project design as assessed in the PHA) are required before commencement of construction while a comprehensive Emergency Plan and Safety Management System are required before the plant is operated by the Proponent. Additional conditions require a hazard audit of the plant within one year of operation and future audits every three years over the operational life of the project.

The Department considers that the requirements for a Hazard and Operability Study, Emergency Plan and Safety Management System and periodic hazard auditing would ensure that the plant is designed, operated and maintained such that hazard-related incidences are avoided or minimised.

6.6 Heritage

Issues

The potential for the site to have previously been used by Aboriginal people was primarily due to the spur crest on the site. 19 Aboriginal sites have previously been registered on the DECC's Aboriginal Heritage Information Management System (AHIMS) within a five km radius of the study area. All of the registered artefact sites are associated with ridge and spur landforms. A subsurface archaeological testing was undertaken on the site which revealed no artefacts of special Aboriginal significance.

The full report on the subsurface testing was not completed before the Environmental Assessment was placed on public exhibition. One private submission objected to the exhibition of the archaeological report in a draft form and considers that proper assessment of Aboriginal cultural heritage cannot be undertaken until the report is in the final form.

The site contains a structure with potential European cultural significance, this being the original "Dairy Bails" building, which illustrates the history of the dairy industry within the Orara Valley.

Consideration

Aboriginal Heritage

The Environmental Assessment was exhibited using the information from the Aboriginal Cultural Heritage Assessment Report prepared by a consultant archaeologist. The report, prepared in conjunction with nominated representatives of the Coffs Harbour and District Local Aboriginal Land Council (LALC) and the Gumbula Julipi Elders Corporation, recommended that subsurface testing be conducted before development proceeds to investigate the possibility that the site may contain undetected evidence of past Aboriginal occupation. Although the full report on the subsurface investigation was not finalised prior to public exhibition, a summary of the findings was available and included within the Environmental Assessment.

The subsurface investigation report has since been approved for distribution by the Coffs Harbour and District Local Aboriginal Land Council (LALC) and the Gumbula Julipi Elders Corporation. A copy of that report is included in Appendix 1 of the Submissions Report.

The subsurface investigation was confined to the potentially sensitive spur crest and upper slopes. 40 artefacts were recovered, representing waste material. The test pit results indicate that the investigation site is highly disturbed, and that the artefacts are restricted to a low density of stone flakes mixed within the topsoil. The proposed WTP would not have an adverse impact on any known sites of mythological, ceremonial or other spiritual significance, nor would it affect any resource or unmodified sites/places of historical or contemporary attachment. It was thus concluded by the Aboriginal stakeholders that the project site is of low level cultural or social significance.

The Department is satisfied that the subsurface investigation has demonstrated the low cultural significance of the site, thus not precluding the development of the WTP. The following measures were recommended in the archaeologist's report, which are reflected in the Proponent's Statement of Commitments and CEMP:

- the Coffs Harbour and District LALC and Gumbula Julipi Elders be permitted to re-deposit artefacts recovered from the test pit investigation. The re-deposition location is to be agreed between the Proponent and DECC;
- in the unlikely event that Aboriginal burial(s) or any material evidence of potentially high significance is uncovered during construction, all disturbance work must cease in the vicinity of the find and DECC, Coffs Harbour and District LALC and Gumbula Julipi Elders contacted immediately for management advice; and
- Council to continue to liaise closely with the above Aboriginal groups in relation to cultural matters to maintain the positive relationship. These groups should be kept informed of the project timetable for construction works.

The above recommendations are supported by DECC, and embodied in the Department's recommended conditions of approval.

European Heritage

The Environmental Assessment indicated that the proposal is unlikely to impact on the Dairy Bails building (shown below in **Figure 8**) due to the WTP being sited north of the shed with a road between the shed and the plant. It was noted that although there are numerous intact timber Dairy Bails in the Orara Valley, they are in private ownership and mainly used as storage sheds, and will disappear over time.

The Department acknowledges the opportunity to retain the dairy bail building under Council's possession and to link it with the WTP for tourist use and interpretation. The Proponent has committed to preserve the building for historical purposes by conserving the galvanised roof sheet and timber wall cladding, waterproofing the roof and

implementing a maintenance strategy. Recommended conditions of approval require the fencing of the area around the Dairy Bails building before commencing construction works to avoid any construction impacts, and the preparation and implementation of a conservation and maintenance strategy to preserve the heritage significance of this structure.

Figure 8: Dairy Bails building



Photo 1 View from near front gate with the Orara River in the background

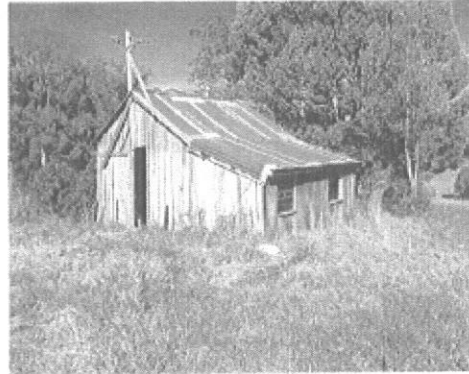


Photo 2 Front and side with cow bail slab at rear

6.7 Traffic and Access

Issues

The key issues with traffic and access involve the potentially unsafe access point from Upper Orara Road to the project site and the significant traffic movements that will be generated during the construction period.

A submission from a nearby resident raised concerns with the current entrance to the site as it is located near the apex of a blind corner which is claimed to have been the site of many accidents. The same submission also expressed concerns about the impact of the increased traffic flows on the regular users of this road.

Consideration

The Environmental Assessment includes a traffic impact assessment report which considered potential construction impacts in terms of the capacity and safety of the proposed traffic routes and also the potential damage for infrastructure. The report also assessed the potential traffic impact of future traffic movements during the operation of the plant.

Construction traffic

Construction of the project is expected to take 18 months. During this period, the primary transport route would be the Pacific Highway to Coramba Road and then proceeding on to the Upper Orara Road to the entrance to the site. Most project-generated traffic is expected to originate from and ultimately return to the Pacific Highway; Upper Orara Road currently experiences an Average Daily Traffic Volume of 690 vehicles per day and has an existing speed limit of 80 km per hour.

The traffic impacts during construction are associated with the traffic movements from construction crews and delivery of materials and equipment. The Environmental Assessment estimated that the project would involve approximately 60 employees, peaking at approximately 100 during short periods for specific aspects of the construction program. Truck traffic is expected to peak at 30 trucks per day (60 movements per day), with an average of 10 trucks arriving at the site over the construction period (ie an average of 20 truck movements per day in and out of the site). The highest frequency of truck movements is expected during concrete pours.

The Proponent recognises the crucial need to improve safety for traffic entering and exiting the site and will undertake and complete the following road and site access works before construction of the plant commences:

- reshaping the embankment on the southern side of Upper Orara Road adjacent to the access point; and
- relocation of the actual entry gate west (up the hill) a further 20 m inside the site's front property boundary, allowing for off-road parking, in the event that the access gate is blocked or closed on arrival.

During construction, the Proponent has committed to implement the following traffic management measures to deal with the increased volume of car and truck movements that will be generated by the proposal:

- installation of advance advisory signs on the approaches to the site's access point;
- provision of appropriate signage and qualified traffic controllers; and
- application of reduced speed limits to the work site when necessary.

The Department considers that safety concerns with traffic movements and accessing the site would be overcome by the road reshaping works which will be completed before construction commences. Although it is acknowledged that construction traffic would inconvenience the regular users of the road for a significant period of time, the impacts should not be unacceptable provided that traffic safety and control measures are properly implemented.

Operational traffic

Operational traffic would primarily be accessing the site during normal daytime working hours. The normal traffic movements would include the following:

- 3 vehicles daily for daily movements of operational staff;
- 76 truck movements per year for the delivery of chemicals required for the treatment process when operating at maximum capacity. Approximately half of this figure is expected during the early years of the plant's operation.

The Department considers that the improved site access conditions would enable safe vehicular/truck movements along this section of Upper Orara Road, and that operational traffic impact from the plant would be minimal given the low volume of traffic movements that would be generated by the plant.

6.8 Flora and Fauna

Issues

The proposal requires some tree clearing involving exotic species (Camphor Laurels), and Australian Natives, but not locally indigenous, are Black Bean and Macadamia trees. The only locally indigenous tree that would be cleared is a mature Flooded Gum on the site, which is a koala food tree.

A nearby property owner has requested the retention of the Gadagi trees on the southern side of Upper Orara Road, opposite the project site, during the reshaping of this section of the road.

Consideration

The Flora and Fauna Assessment undertaken in the Environmental Assessment found that no areas of the remnant native vegetation would be affected by the project. These patches of native vegetation (approx. 0.7 ha) consisting of scattered Flooded Gums adjacent to the Orara River and Tall Open Blue Gum – Tallowood forest at the south of the site entrance (see **Figure 9** below) are formally mapped as "Tertiary Koala Habitat" under Council's *Koala Habitat Plan of Management*¹

Threatened flora and fauna species, populations and EECs that are known to occur within a 10 km radius of the project site were investigated. The investigations found that the site contains potential habitat for 10 threatened plant species. However, a thorough site inspection failed to locate any threatened flora species.

The site was also identified as containing potential habitat for 36 threatened fauna species. The single Sydney Blue Gum on the site contains a large number of hollows that would provide potential breeding habitat for

¹ The requirements of SEPP 44 - Koala Habitat Protection do not apply to the proposal as Coffs Harbour local government area is not listed on Schedule 1 of the SEPP.

threatened species such as Glossy Black-Cockatoo, Large-footed Myotis, Eastern Freetail Bat, Hoary Wattled Bat, and Wood Duck. Although there were concerns about this tree shedding branches, the tree would be retained. A condition is recommended requiring the retention and protection of the tree during construction and operation of the project. The tree may only be removed if it poses safety concerns to life and/or property, as verified by a qualified arborist.

Figure 9: Site Vegetation and Koala Habitat



The grassy flats adjacent to the Orara River may also provide a seasonal forage for endangered and vulnerable species such as Giant Barred Frog, Stuttering Frog, Green-thighed Frog, Square-tailed Kite, Masked Owl and Stephens Banded Snake. This area would remain largely unaffected by the proposal.

Based on the above findings, the Department considers that the only significant impact on the trees presently on the site is the removal of the mature Flooded Gum which could be a habitat for threatened species. However, an Assessment of Significance conducted for this species concluded that its removal is not likely to place any extant local Koala population at risk of extinction, or have a significant effect on other threatened species. As a compensation measure, the Proponent has committed to plant locally indigenous trees (which include Flooded Gum, Sydney Blue Gum and Tallowwood) that would create a link with the remnant vegetation on the site. Through a recommended condition of approval, the Proponent will be required to prepare and submit an Urban Design and Landscaping Plan for the Director-General's approval detailing the landscaping to be undertaken and a schedule of species to be used.

In relation to aquatic species, fish or macroinvertebrates, the construction and operation of the WTP is unlikely to result in any significant impact on these species. Soil and water management controls would be employed during site preparation and construction activities, as contained in the Proponent's Statement of Commitments and CEMP, and also reflected in the recommended conditions of approval. The design and operation of the project does not involve any discharges of pollutants on the site or nearby Orara River, thus ensuring no off-site impacts.

In conclusion, the Department considers that the proposed tree planting would suitably compensate for the small number of trees that would be cleared for the construction of the project.

6.9 Water fluoridation

Issues

The proposed WTP incorporates fluoridation facilities to enable the fluoridation of the Coffs Harbour water supply. Submissions from two local action groups strongly objected to the proposed fluoridation on the following grounds:

- consider that fluoridation is an unsafe, unproven and unethical practice;
- the proposed dosage rate of 1.0 Mg/l of fluoride in a sub-tropical region being excessive and cannot be justified;
- concerns about the additional cost from ongoing fluoridation; and
- Council not having carried out an adequate consultation process for the introduction of fluoride to the water supply.

One of these submissions criticised the Proponent for the lack of promotion of the project, and specifically the inadequate consultation process regarding the introduction of fluoride to the Coffs Harbour water supply.

Consideration

The Department considers that the fluoridation issue is outside the scope of its environmental assessment of the project, as it is a matter between the Council as the water supplier and NSW Health as the health regulator of drinking water. The Fluoridation of Public Water Supplies Act 1957 and the associated Regulations and Code of Practice govern the community communication and implementation of the fluoridation risk control strategy. The Department also understands that the design and operational system of the fluoridating system in the proposed plant would be subject to the approval of the Department of Water and Energy. Consequently, the issues raised in the submissions are not addressed in this report.

7 CONCLUSION AND RECOMMENDATION

The need for a new, modern treatment plant was dictated by the Proponent's aim to provide Coffs Harbour residents with drinking water that meets the minimum requirements of the *Australian Drinking Water Guidelines* at all times. The current level of treatment is considered insufficient to guarantee a quality that meets these guidelines at all times.

The Department is satisfied that there is a need for the project based on the water quality risk assessment undertaken and expected changes in future extraction regime from Coffs Harbour's water supply sources which may result in further deterioration of existing drinking water quality.

The design of the facility incorporates a range of features and controls to minimise the potential for adverse impacts on the environment. The new plant will operate without any discharges of waste water (supernatant) on the site or the surrounding environment. Waste water will be routinely returned to Karangi Dam or to the plant's head works for recycling. The proposed treatment process (dissolved air flotation-filtration followed by ultra-violet disinfection and then chlorination) was chosen after consideration of a risk based approach in accordance with the *Australian Drinking Water Quality Guidelines*. The performance targets for the water treatment satisfy water quality risk and water quality requirements in these guidelines.

The main concerns of neighbouring residents are the construction impacts (noise and traffic), cumulative visual impact of the proposal with the adjacent TransGrid substation, and the use and storage of chemicals on site. The bulk of potential impacts will be at the construction stage. The Proponent has committed to a wide range of environmental management and mitigation measures in its Statement of Commitments and Construction Environmental Management Plan which, if properly implemented, would minimise potential impacts. In addition, the Department has recommended conditions that specifically address potential construction issues (noise, air quality and soil erosion and sedimentation) and operational issues such as safety management and emergency planning, and monitoring and auditing requirements. These conditions would ensure that the water treatment plan is operated safely and environmental impacts are acceptable to surrounding residences and environment.

The project will deliver significant improvements in the quality of drinking water supplied to Coffs Harbour and surrounding areas over the next three decades. The project would also enable the preservation of the historically significant Dairy Bails building on the site and the re-deposition to an appropriate location of the Aboriginal artefacts uncovered from the recent subsurface testing conducted on the site. The proposed extensive landscaping would over time provide effective visual screening and diminish the visual impact of the project.

Although surrounding residences and the local community would experience impacts during the construction period, the Department considers that these impacts can be mitigated and managed to achieve acceptable outcomes, provided mitigation measures committed by the Proponent are properly implemented.

Given the expected community benefits from the project and the proposed environmental measures during construction and operation, the Department recommends that the Project Application be approved subject to the conditions of approval set out in Appendix A.

APPENDIX A. RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B. STATEMENT OF COMMITMENTS

CONTAINED IN THE ATTACHED SUBMISSIONS REPORT (IN CD ROM)

APPENDIX C. ENVIRONMENTAL ASSESSMENT

CONTAINED IN THE ATTACHED CD ROM