

WYONG SHIRE COUNCIL

11 January 2007

To Council

Prepared by:
Maunsell Australia Pty Ltd

TUGGERAH BEACH TEMPORARY DESALINATION PLANT

SCHEDULE: CONDITIONS OF CONSENT

Development details

1. The development shall be in accordance with the development application as described in:

- (a) *Wyong Shire Council Temporary Desalination Plant – Tuggerah Beach – Statement of Environmental Effects*, reference 22931 / R01, revision 1; prepared by Connell Wagner Pty Ltd, dated 27 September 2006.

Supported by the following assessment documents:

- (b) *Test Drilling, Bore Construction and Aquifer Testing Temporary Desalination Plants Gosford and Wyong Local Government Areas*, for Department of Commerce, prepared by Hydroilex, 5 July 2006
- (c) *Groundwater Flow and Potential for Groundwater Contamination - Southern Part of Magenta Shores Development Site, The Entrance North*, Letter to Department of Commerce, prepared by Hydroilex, 5 August 2006
- (d) *Detailed Conceptual Design of Beach Bore Intakes and Brine Discharge to Ocean – Temporary Desalination Plants, Wyong Area*, by Water Research Laboratory, August 2006.
- (e) *Dilution of Seawater Concentrate and Groundwater Level Drawdown Associated with a 4ML/day Temporary Desalination Plant*, Letter to Department of Commerce, prepared by Water Research Laboratory, 11 September 2006.

Amended by the following:

- (f) Revised 2 ML/D desalination compound layout prepared by NSW Department of Commerce, dated 8/11/2006, titled "*Typical 2 ML/D Temporary Desalination Plant Layout*" (reference: REVISION).
- (g) *Wyong Temporary Desalination Units – Budgewoi South (Site 2) Typical Beach Well Pipework* Drawing No. WYONG 550, Revision 1, 31/10/2006.
- (h) *Detailed Conceptual Design of Beach Well Intakes – 4 ML/Day Intake Model Scenario*, prepared by Water Research Laboratory, dated 7 November 2006.
- (i) Suggested Monitoring Programme for Temporary Desalination Plants (Finished Water), supplied by applicant 6 November 2006
- (j) Clarification received regarding vehicle numbers during construction and construction timeframe via email from applicant dated 10 November 2006
- (k) *Typical Pipe and Conduit Trench Details Across Sand Dunes*, Drawing Reference: WYONG 603, Revision 0, dated 13/12/2006
- (l) *Wyong Desalination Plants – Supplementary Information Figure 3 – Design Tuggerah Beach*. Reference: DESAL\22931\AMc\DESIGN_MAG\15-12-06\R1

- (m) *Draft Shore Bird Census – Proposed Temporary Desalination Plants Wyong Shire Council, Revision 0, dated 15 December 2006, prepared by Connell Wagner*
- (n) *Utility Services Investigation Desalination Site #5 Magenta, Barry Hunt Associates, Drawing Reference: 3270SERVICES*
- (o) *Greenhouse Gas Emissions and Mitigation – Temporary Desalination Plants Wyong Shire Council, Revision 1, Reference 22931.02, dated 15 December 2006, prepared by Connell Wagner.*

2. The pre-treatment plant containers shall be up to 23m in length, 2.5m wide and 2.5m in height (excluding footings).

Reason: To minimise visual impact and extent of influence of structures proposed

3. Fresh water delivery tank shall be a maximum of 2.5m in height and 5m in diameter.

Reason: To minimise visual impact and extent of influence of structures proposed.

4. Construction period for the temporary desalination plant shall be no longer than 3 months from commencement of construction to commissioning of desalination plant.

Reason: To minimise impacts on car parking and access to the coast.

5. The proposed desalination plant will have a maximum operational life of two years. The operational life will commence upon notification in writing to Council's Development Assessment Unit of the date of commissioning. No operations are to be commenced until such written notification has been received by Council's Development Assessment Unit. The operation is to cease within two years of the date of commissioning.

Reason: To ensure the proposed desalination plant is temporary and to provide Council's Development Assessment Unit with adequate notice in relation to commissioning and decommissioning of the plant.

6. After two years of operation the desalination plant shall be decommissioned and all infrastructure removed and the site returned to a pre-development state within three months of cessation of operations. Works to be removed comprise:

- (a) SWRO and pre-treatment process units;
- (b) all aboveground pipe work, holding tanks and other structures within the temporary desalination plant compound;
- (c) all fencing;
- (d) all beach infrastructure comprising all beach wells and connecting pipelines and the seawater concentrate return and outlet; and
- (e) all ancillary works associated with the above infrastructure.

Note to Condition: Any structures or services proposed to be retained permanently on site or the retention of temporary structures or services beyond the two year timeframe would be subject to a separate application. In this instance, separate application(s) for all necessary approvals from Government Agencies, including Council will be required.

Reason: To minimise potential for beach infrastructure to become exposed, which may impact visually, exacerbate impacts on beach and potentially compromise public safety.

Beach Infrastructure

7. Beach wells are to be constructed with the upper most portions at least 1 m below the 1 in 100 year ARI storm event (eroded) beach profile.

Reason: To minimise potential for bores to become exposed during a storm event.

Hours of Operation

8. Construction work may only be undertaken from 1 February to 30 November.

Reason: To minimise potential for conflict with beachgoers during the peak holiday season.

9. No construction work to the east of the crest of the foredune may take place on Saturdays, Sundays or Public Holidays during the months of February, March and November.

Reason: To minimise potential for conflict with beachgoers during the peak holiday season.

10. Construction work may only be undertaken in accordance with the provisions of the Environmental Protection Authority's 'Environmental Noise Control Manual-Guidelines for Construction Noise' as identified below :

- (f) Monday to Friday 7.00 am to 6.00 pm;
- (g) Saturday 8.00 am to 1.00 pm; and
- (h) Work is not to be carried out on Sundays or Public Holidays.

Reason: To minimise potential for conflict with beachgoers during the peak holiday season and to protect amenity of surrounding residences.

11. Decommissioning and restoration works to the east of the foredune shall not take place during the peak summer months (1 December to 28 February).

Reason: To minimise impacts on public access to the beach.

Approved Plans

12. A copy of the stamped approved plans and documents must be kept on site for the duration of site works and be made available upon request to either the Principal Certifying Authority or an officer of the Council.

Building Code of Australia

13. Compliance is required with the relevant provisions and requirements of the *Building Code of Australia*.

Record of Inspections Carried Out

14. In accordance with clause 162B of the *Environmental Planning and Assessment Regulation 2000*, the certifying authority responsible for critical stage inspections must make a record of each inspection as soon as practicable after it has been carried out. Where Council is not the PCA, the PCA is to forward a copy of all records to Council.

The record must include details of:

- (a) the development application and construction certificate number;
- (b) the address of the property at which the inspection was carried out;
- (c) the type of inspection;
- (d) the date on which it was carried out;
- (e) the name and accreditation number of the certifying authority by whom the inspection was carried out; and
- (f) whether or not the inspection was satisfactory in the opinion of the certifying authority that carried it out.

Inspections are to be arranged with Council as the Principal Certifying Authority. Notice of required inspection must be given 48 hours prior to inspection, by contacting Council's Customer Service Department on (02) 4350 5555.

Other authorities

15. Compliance in full with the General Terms of Approval stipulated by the NSW Department of Primary Industries (Fisheries), dated 6 October 2006 (Permit No. 06/293).

Reason: To advise of the requirements of other approval bodies.

16. Compliance in full with the General Terms of Approval stipulated by the Mine Subsidence Board, dated 13 October 2006 (Reference: Building Application No BA06-2506W5).

Note to condition: current approval by the Mine Subsidence Board limits the life of the structure proposed until January 2009. Due to delays in timeframe the applicant must submit an amendment to the Mine Subsidence Board to extend the life of the temporary desalination plant beyond January 2009, if required.

Reason: To advise of the requirements of other approval bodies.

17. Compliance in full with the General Terms of Approval stipulated by the NSW Department of Natural Resources under Part 5 of the *Water Act 1912*, dated 21 November 2006.

Reason: To advise of the requirements of other approval bodies.

18. Requirements of the *Waste Avoidance and Recovery Act 2001* shall be met during construction and operation.

Reason: To advise of the requirements of other approval bodies.

Certificates / Engineering Details

19. A Construction Certificate is to be issued by the Certifying Authority prior to commencement of any works. The application for this Certificate is to satisfy all of the requirements of the *Environmental Planning and Assessment Regulation 2000*.

Reason: To satisfy the requirements of the Environmental Planning and Assessment Regulation 2000.

20. A Construction Certificate application for this project is to include a list of fire safety measures proposed to be installed in the structures and / or on the land and include a separate list of any fire safety measures that exist on the site. The lists must describe the extent, capability and basis of design for each measure.

Reason: To provide appropriate measures to prevent or minimise damage in the event of fire.

21. The obtaining of a Certificate of Compliance under the *Water Management Act 2000* for water and sewer requirements from Wyong Shire Council as the Water Supply Authority. Design plans are to be approved by Council prior to the issue of a Construction Certificate.

Reason: To ensure the development is consistent with the requirements of Council in relation to water and sewer.

22. Satisfactory structural plans prepared by a suitably qualified Structural Engineer must be submitted to and approved by Council for the placement of containers and construction of tanks within the desalination plant compound prior to the issue of a Construction Certificate.

Reason: To ensure the containers are structurally sound.

Environmental Management Plan

23. A **Construction Environmental Management Plan** must be submitted to Council's Development Assessment Unit for approval prior to commencement of construction. The Plan shall incorporate all relevant management plans and relevant requirements as described in the development application documents and these conditions of consent.

Reason: To formulate and implement strategies for minimising or mitigating impacts on the environment and communicate these actions to staff and contractors.

24. An **Operational Environmental Management Plan** must be submitted to Council's Development Assessment Unit for approval prior to commissioning the temporary desalination plant. The Plan shall incorporate all relevant management plans and relevant requirements as described in the development application documents and these conditions of consent.

Reason: To formulate and implement strategies for minimising or mitigating impacts on the environment and communicate these actions to staff and contractors involved in operating the facility.

25. The management protocols and requirements associated with the following matters shall be included in all contract documentation, plans and specifications used by each civil contractor and sub-contractors (as a minimum):
- (a) aquatic and terrestrial ecology conditions relating to tree and vegetation retention, protection and rehabilitation;
 - (b) erosion and sediment controls; and
 - (c) risk and safety management measures and protocols.

In addition, the consultant specialists in ecology, erosion and sediment control and risk and safety are to induct each civil contractor and sub-contractor in relation to the relevant protocols and requirements. Evidence of compliance with this condition is to be provided to Council's Development Assessment Unit on an ongoing basis.

Reason: To ensure contractors are aware of all key environmental and public safety management requirements.

Acid Sulphate Soils

26. An **Acid Sulphate Soil Management Plan** shall be prepared by a suitably qualified person in accordance with the *Acid Sulfate Soils Assessment Guidelines* and the *Acid Sulfate Soil Manual* (Acid Sulfate Soils Management Advisory Committee, 1998). The ASSMP shall be submitted to Council's Development Assessment Unit and the Department of Natural Resources for approval prior to issue of the Construction Certificate. The Plan shall determine the potential for acid generation arising from the disturbance of acid sulfate soils and implement measures to avoid or minimise acid generation, which includes (but not limited to):
- (a) whether any excavation works will result in the exposure of acid sulfate soils; and
 - (b) whether lowering of the water table will result in the drainage of subsurface acid sulfate soils and the potential leaching of acid laden groundwater.

Any recommendations of the management plan must be implemented in the construction and operation of the plant.

Note to Condition:

Particular matters that must be addressed in the investigations and management plan include:

- *Confirmation, or otherwise, of the presence of Potential ASS at depth under the beach and any required mitigation*
- *Confirmation, or otherwise, of the presence of Actual ASS or Potential ASS in areas affected by the groundwater drawdown (as shown in the groundwater modelling provided as part of this application and any required mitigation).*

Reason: To avoid or mitigate the potential for disturbing or generating acid sulphate soils.

Signage

27. Engineering details must be submitted to Council regarding structural adequacy of signage, prior to issue of the Construction Certificate.

Reason: To ensure the stability of signage proposed.

Ecologically Sustainable Development

28. The drinking water produced by this desalination plant shall be priced to reflect the true cost associated with the supply of water including projected greenhouse emission costs associated with electricity supply in accordance with any requirements of the Independent Pricing And Regulatory Tribunal (IPART). Details are to be provided to and approved by Council's Development Assessment Unit.

Reason: To meet the intent of ESD principles, in particular the principle of "improved valuation, pricing and incentive mechanisms".

29. The most recent and the most energy efficient technology possible must be selected for the temporary desalination plant. Details are to be submitted to Council's Development Assessment Unit prior to order of the temporary desalination plant. All monitoring of the process must be independently verified by a suitably qualified person prior to submission to Council.

Reason: To minimise use of energy.

30. The proponent shall mitigate the plant's actual greenhouse gas emissions by purchasing enough GreenPower accredited renewable energy to offset 100% of the desalination plant's energy use. Further, monitoring and documentation of the plant's actual energy use shall be undertaken over the two year life of the temporary plant. Evidence of calculations and identification of green energy options to be used to meet this greenhouse gas emissions criterion, including an implementation plan, are to be provided to Council's Development Assessment Unit for approval within six months of commencement of the operation of the plant. The offsetting of each year's energy use through the purchase of green energy, as well as all calculations and documentation submitted to Council, must be independently verified by a suitably qualified person.

Reason: To mitigate 100% of the greenhouse gas emissions (and hence, significantly reduce greenhouse intensity) of water supplied for the duration of the proposed temporary desalination plant, avoiding long term greenhouse impacts.

31. The proponent must monitor and report (and where necessary calculate using published emission factors) the greenhouse emissions from other non-electricity sources associated with the temporary desalination plant, for the life of the temporary desalination plant, in order to develop a comprehensive inventory of greenhouse emissions covering all gas types and emission sources. This monitoring is to be submitted to Council's Development Assessment Unit at least at least once per annum and be disclosed publicly.

Note to Condition: To give effect to this Condition of Consent, the following emission sources are to be specifically addressed:

- *Vehicle fuel types and the amount of each used during construction, operation and decommissioning is to be documented, with the greenhouse emissions associated with fuel use calculated and added to the inventory of greenhouse emissions.*
- *The types and quantities of waste generated during construction, operation and decommissioning and final destination of the waste are to be documented. If waste is sent to a landfill, the use of methane capture and flaring by the landfill is to be documented. The greenhouse emissions for each type of waste are to be calculated and added to the inventory of greenhouse emissions.*

- *The operator shall monitor SF₆ (Sulphur Hexafluoride) gas levels in switchgear, if used, in order to identify any leakage of this gas. If leakage does occur, the amount lost is to be reported and the greenhouse emissions associated with this loss are to be calculated and added to the inventory of greenhouse emissions.*
- *The proponent is required to determine, calculate and document the extent of greenhouse emissions from the water treatment processes used to convert the desalinated water to drinking water standard as part of the Construction Environmental Management Plan. Where greenhouse emissions are identified, they are to be added to the inventory of greenhouse emissions.*

Reason: To provide a comprehensive inventory of the non-electricity related greenhouse emissions of the proposal in order to determine greenhouse intensity of the desalination plant(s) water.

32. The operator shall monitor SF₆ (Sulphur Hexafluoride) gas levels in switchgear, if used, in order to identify any leakage of this gas. Measures taken to minimise loss of gas and the monitoring results must be documented in the Construction Environmental Management Plan. Details of monitoring are to be submitted to Council's Development Assessment Unit at least every six months.

Reason: To avoid long term greenhouse impacts by mitigating greenhouse gas emissions.

Erosion and Sediment Control

33. An **Erosion and Sediment Control Management Plan** must be submitted to and approved by Council's Development Assessment Unit prior to commencement of construction.

Reason: To minimise erosion and sedimentation.

34. The control of soil erosion on the site and the prevention of silt discharge into drainage systems and waterways in accordance with *Council's Policy E1 - Erosion and Sediment Control from Building Sites and Development Control Plan No. 67 – Engineering Requirements for Development*. The design plans must be approved by the Principal Certifying Authority prior to issue of the Construction Certificate. The plan must also address the guidelines (where appropriate) for construction, operation and rehabilitation contained in:

- (c) Landcom, 2004, *Managing Urban Stormwater: Soils and Construction* ("The Blue Book") revised fourth edition, reprinted July 2006; and
- (d) NSW Department of Land and Water Conservation, 2001, *Coastal Dune Management: A Manual of Coastal Dune Management and Rehabilitation Techniques*, Coastal Unit, DLWC, Newcastle.

Reason: To promote best practice management of development in mitigating erosion and sedimentation.

35. The Erosion and Sediment Control Management Plan shall specify details of how the seawater return pit (outlet) and pipeline would be constructed, with consideration of the erosion/accretion status of the beach.

Reason: To minimise potential for impacts on erosion of the beach as a result of the seawater return infrastructure.

36. Where clearing of vegetation is necessary, it must be demonstrated to the satisfaction of Council's Development Assessment Unit that damage to dunal vegetation will be minimised. Where vegetation needs to be removed, appropriate measures for preventing soil erosion must be implemented.

Reason: To protect dune stability during construction and operation

37. On completion of construction in each currently vegetated work area, revegetation of disturbed areas shall be undertaken with appropriate native species. This revegetation is to be completed as soon as practicable after the completion of construction.

Reason: To minimise potential for erosion of dunes.

38. Erosion and sediment control is to be conducted according to Best Management Practice and include aspects of:

- (a) Work scheduling, such that protective measures are installed prior to earthworks commencing
- (b) Works shall cease during rain
- (c) Deployment of protective measures (e.g. site drainage, separation of 'clean' and 'dirty' water, silt stop fencing, hay bales, sediment traps, etc.);
- (d) Constant maintenance of those measures (e.g. replacement of torn or fallen or silt stop fencing, removing accumulated sediment etc.) including overnight and on weekends or prior to RDO's (rostered days off); and
- (e) Maintenance required must minimise disturbance to the dune vegetation.

Reason: To promote best practice management of development in mitigating erosion and sedimentation.

39. The provision of a single all weather access way incorporating a vehicle shake down or wheel wash device, as appropriate, within the property, extending from the kerb and gutter to the building under construction so as to provide appropriate access to the site which will reduce the potential for erosion to occur and for materials to be tracked onto the road by vehicles in accordance with the requirements of Council's Policy E1 - Erosion and Sediment Control from Building Sites. **Note: On-the-spot fines may be imposed by Council for non-compliance with this condition.**

40. Sand and other materials that could potentially be washed off the site during rain periods are to be stored behind the silt control barrier. **Note: On-the-spot fines may be imposed by Council for non-compliance with this condition.**

41. Any beach stabilisation works (including steps and fencing) that are removed must be replaced immediately upon completion of works and a suitable board and chain arrangement shall be installed along the full length of the accessway across the dune used for laying the pipeline. These works are to be completed and approved by Council's Development Assessment Unit prior to the commissioning of the plant.

Reason: To provide protection of the pipeline infrastructure buried below the dune against the effects of wind and storm erosion.

42. The following monitoring shall be described in the Erosion and Sediment Control Management Plan and be undertaken during construction and operation:
- (a) ground levels across the dune shall be monitored by regular (at least weekly) visual inspections;
 - (b) the beach well area shall be inspected regularly (at least weekly) to ensure that erosion has not exposed the well heads and pipelines;
 - (c) ground levels along the accessway shall also be surveyed at intervals no greater than eight weeks; and
 - (d) additional inspections and surveys of all surface and subsurface infrastructure locations are to be undertaken immediately following coastal storms.

The proposed programme of monitoring is to be submitted to and approved by Council's Development Assessment Unit. Copies of records of monitoring are to be provided to Council's Development Assessment Unit every three months.

Reason: To monitor and respond to performance of management measures.

43. Ground survey data and digital photographs from the inspections shall be stored securely and compared against previous data to ensure that the risk for infrastructure exposure is minimised.

Reason: To provide ongoing monitoring and recording of erosion near temporary desalination works.

44. Detailed design of the temporary desalination plant and associated works shall be in accordance with the recommendations of the publication *Coastal Dune Management*, 2001, prepared by the Department of Land and Water Conservation.

Reason: To promote best practice design of works to protect dune system.

Water Quality

45. A **Supplementary Water Quality Analysis Report** must be submitted for the approval of Council's Development Assessment Unit prior to commencement of operations. Once approved, the Report must become part of the Operational Environmental Management Plan.

Reason: To document results of the water quality analysis.

46. The Supplementary Water Quality Analysis Report must demonstrate that the proposed bio-fouling environmental management methodology does not result in harmful traces of chemicals used by the development being introduced into the ocean via the seawater return (brine) stream. The Operational Environmental Management Plan shall contain clear indication of the anti-scalant to be used and provide evidence that the discharge of anti-scalant to the ocean would have minimal effect on the environment. Details must be submitted and approved by Council's Development Assessment Unit prior to commencement of operations.

Reason: To identify and formulate effective mitigation measures to minimise potential impacts of chemicals used and the potential for bio-fouling impacts on water quality as part of detailed design.

47. The Supplementary Water Quality Analysis Report must demonstrate that the seawater (brine) concentrate does not have adverse environmental impacts when discharged (*Note: this may include comparison with the ANZECC Water Quality guidelines*). The required quality shall be dictated by the conditions of a discharge licence to be obtained from the Department of Environment and Conservation.

Reason: To advise of the requirements of other approval bodies.

48. The Supplementary Water Quality Analysis Report must demonstrate that the proposed membrane cleaning methodology does not result in harmful traces of the chemicals being introduced into the ocean via the seawater (brine) stream.

Reason: To minimise impacts on water quality associated with the seawater return.

49. The Supplementary Water Quality Analysis Report must include a programme of testing brine dispersion over a range of wave and wind conditions to monitor impacts of the proposed development. This monitoring must commence immediately following commissioning. If the monitoring finds the dense brine is settling within beach parallel gutters during calm conditions, relevant mitigation measures must be incorporated into the Operational Environmental Management Plan and implemented to the satisfaction of Council's Development Assessment Unit.

Reason: To provide more certainty regarding the impacts of discharge into the swash zone.

50. The Supplementary Water Quality Analysis Report must include a monitoring programme and mitigative management strategies for pipe leakage for the operational phase of the project.

Reason: To provide more details regarding the minimising of potential for pipe leakages.

51. Regular monitoring of ammonia, total dissolved solids and other potential landfill leachate contaminants within the intake feed water, at least on a weekly basis, throughout the operation of the proposed temporary desalination plant. Appropriate mitigation strategies shall be implemented if elevated levels of contaminants are evident.

Reason: To minimise the potential for impacts of contamination of the intake feed water.

Fine tuning of beach wells

52. Pilot testing must be carried out in accordance with the report entitled *Detailed Conceptual Design of Beach Bore Intakes and Brine Discharge to Ocean – Temporary Desalination Plans, Wyong Area*, prepared by Water Research Laboratory, dated August 2006 (reference WRL Technical Report 2006/19), which was submitted with the development application. This testing is to be used to fine tune spacing and yield of beach wells as well as establishing whether the resulting draw down of the water table is equivalent to that estimated in the development application documentation. Details of the testing carried out and the results, including any proposed amendments required as a result of the conclusions, are to be submitted to Council's Development Assessment Unit for approval prior to commencement of construction.

Reason: To demonstrate the beach wells are positioned to be most effective in minimising impacts associated with groundwater drawdown.

Note to condition: In the event that the beach wells are significantly modified as a result of pilot testing in terms of spacing, configuration, depth or number, additional impact assessment would be required as part of an application to modify to the development consent. Minor amendments may be considered and mitigation measures included as part of the Construction Environmental Management Plan.

Groundwater

53. Groundwater levels must be monitored at weekly intervals in the vicinity of the borefield, with details of the monitoring strategy to be included in the Operational Environmental Management Plan to the satisfaction of Council's Development Assessment Unit. This monitoring shall be of sufficient duration to establish the steady state draw down during ongoing operation of the plant. The monitoring strategy shall also identify potentially sensitive structural (such as roads, buildings, pipelines and the like) and ecological sites and establish appropriate draw down limits at such sites.

Reason: To monitor the performance of drawdown and associated impacts on the environment.

54. A network of monitoring points shall be established in the vicinity of the site to monitor groundwater levels, which will compare the groundwater levels to the draw down from the temporary desalination plant for the duration of the development. Details of the proposed monitoring strategy are to be provided to Council's Development Assessment Unit prior to commencing operations.

Results are to be tabulated and provided to Council's Development Assessment Unit every three months.

Reason: To monitor the performance of drawdown and associated impacts on the environment.

55. Undertake seasonal monitoring (four times per year) of the impact of groundwater extraction on coastal saltmarsh, swamp oak rushland forest and coastal wetland ecological communities within the zone of groundwater drawdown influence of the temporary desalination plant. This monitoring programme will measure the area of extent and health (indicators of diminishing health would be changes to species composition, decline in area of cover, reduction of plant density and plant die-off) of each community within the zone of groundwater drawdown influence of each

desalination plant and at replicated control sites outside this zone to allow a statistically robust assessment of the impact of saline groundwater extraction on these ecological communities. The comparison of ecological communities and findings must be published in appropriate scientific literature and made available to the wider community.

Reason: To establish the ongoing impacts on sensitive ecological communities.

56. Results of all monitoring shall be made available to the wider community, via webpage or newsletter, within one month of monitoring being carried out.

Reason: so future projects can benefit from the knowledge gained.

57. Monitoring wells shall be installed between the former landfill and the proposed extraction boreholes (including a location close to the southern boundary of the landfill site). Monitoring wells shall be sampled for the standard suite of analytes for monitoring of landfills of this type. This standard suite of analytes shall be those nominated in the NSW EPA (January, 1996) *Environmental Guidelines: Solid Waste Landfills*, Benchmark Technique No.5 – Groundwater Monitoring Program. Sampling shall be carried out, analysed and reported on a weekly basis. If concentrations of any analytes detected exceed those nominated in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, October 2000, Volume 1, Chapter 6 – Drinking Water, further investigation shall be conducted and mitigation measures implemented to ensure seawater return (brine) discharge and water supplies meet required standards (refer Condition 47 for seawater return discharge quality and Condition 61 for water supply quality).

Reason: To monitor groundwater for contaminants and enable adequate response in the event contamination is evident.

Flooding

58. The design of the development must comply with Council's Flood Prone Land Development Policy No F4, and in particular:
- (a) the underside of buildings is to be open with minimum obstructions in the direction of flow;
 - (b) the provision to Council of a satisfactory structural certificate from a qualified Engineer as to building stability in relation to horizontal loadings from flowing water and debris, buoyancy, overturning and sliding;
 - (c) open type fences are to be located in the direction of flow and are to be of such a height and type so as not to restrict the flow of water or cause an accumulation of debris;
 - (d) floor levels for the desalination and water treatment containers are to be located at least 300mm above the 1 in 100 year flood level; and
 - (e) the location of all electrical fixtures, gas outlets, all toxic, pollutant or other hazardous substances stored on the property are to be at a minimum height of 500mm above the designated flood level.

Reason: To minimise impacts of flooding on infrastructure.

59. Locations of chemical storage and electrical facilities shall stipulated in the Operational Environmental Management Plan and must be appropriately located to minimise the potential for spilling at times of flood.

Reason: To minimise potential for chemical spills as a result of flooding.

60. Development consent is required for fill in excess of 100mm in height or any retaining walls not indicated on the approved plans which are:

- (a) 600mm or more in height;
- (b) on or within 900mm of a boundary; or
- (c) supporting the dwelling, fence, pool or ancillary structure.

Reason: To ensure filling is not undertaken without appropriate consideration of impacts.

Water supply

61. A **Water Supply Sampling Programme** shall be undertaken that is consistent with Wyong Shire Council's existing potable water quality monitoring programme to test water produced by the plant prior to being pumped into the mains water supply. A comprehensive description of the Water Supply Sampling Programme must be submitted and approved by Council's Development Assessment Unit prior to the commencement of operations. This programme must also be in accordance with the *Suggested Monitoring Programme for Temporary Desalination Plants (Finished Water)* described in the Independent Assessment Report for Tuggerah Beach Temporary Desalination Plant (prepared by Maunsell Australia, dated 23 November 2006). The Sampling Programme must ensure compliance with Council's existing drinking water quality standards and must be carried out and documented to the satisfaction of Council's Development Assessment Unit.

Reason: To ensure water supplied to the community from the temporary desalination plant is of suitable quality.

Aquatic ecology

62. An **Aquatic Ecology Pilot Study** must be undertaken to determine the appropriate scale and methodology for a more detailed study that will determine the impacts of the discharge points on beach fauna and water quality. A pilot study and monitoring programme will be developed for implementation during design and operation of the plant to verify potential water quality and marine ecology impacts associated with the discharge of seawater concentrate. The pilot study will determine the vertical and horizontal distribution of beach fauna in and around the swash discharge zone and would be accomplished by:

- (a) two surveys collecting long (up to 40cm) sieved, sand cores at varying spatial scales away from the point impact source to depths of at least 15m via two days of field sampling and a week of laboratory identification work;
- (b) identification of the animals and their abundance and water quality measurements at various depths and spatial scales;
- (c) water quality sampling (particularly for temperature, turbidity and salinity) would be conducted using a portable multi-probe instrument so as to avoid processing in a chemical laboratory; and

- (d) determining the appropriate depth, spatial scale and replication level for sampling fauna in the main monitoring programme to ensure adequate statistical power to detect impacts.

Results of the Pilot Study are to be submitted to Council's Development Assessment Unit.

Reason: To establish the intensity, spatial location and temporal frequency of monitoring required in the Detailed Monitoring Programme so that any impacts will be statistically identifiable.

63. Undertake a **Detailed Aquatic Ecology Monitoring Programme** that will determine the impacts of the discharge points on beach fauna and water quality. The monitoring programme will include the following:

- (a) a spatially replicated, 'before-after, control-impact' experimental design using the gradient approach of measuring impacts on benthic fauna and water quality at set distances away from the point source at the impact zone;
- (b) three control sites with similar ecosystems as the impact sites but well clear of the potential impact zone in order to adequately, statistically compare with the three impact sites;
- (c) temporally (for at least the two year operation of the desalination plant and at least one year after decommissioning) and spatially replicated surveys at each site of a frequency and location determined in the pilot study that will ensure adequate statistical power to detect impacts;
- (d) at least two samples must be taken before the desalination plant is operational (and submitted to Council's Development Assessment Unit) and subsequent operational sampling must occur at the frequency determined in the pilot study which must include samples taken in the same season(s) as the initial two samples;
- (e) discharge water quality monitoring will involve:
 - monitoring (when flowing) of discharge volume, turbidity, total dissolved solids (salinity) and dissolved oxygen (DO);
 - toxicity testing of discharge of treatment chemicals in discharge water; and
 - the water sampling results of monitoring programme shall be compared to ANZECC and ARMCANZ *Guidelines for Fresh and Marine Water Quality 2000*. Where the level is in excess of the guideline value, this must be reported to the DEC and contingency plan implemented; and
- (f) dissemination of results for access by the wider scientific and general community, via a peer-reviewed publication.

If potentially significant aquatic or terrestrial ecological impacts are identified by any monitoring results, appropriate mitigation measures must be formulated and incorporated into the Operational Environmental Management Plan to the satisfaction of Council's Development Assessment Unit. If potentially significant impacts are encountered as a result of these studies that, with current knowledge, cannot be mitigated, desalination plant operations shall cease until such time as measures can be implemented to avoid such impacts (Note: this requirement has no effect on the life of the temporary desalination plant specified elsewhere in these conditions of consent).

Reason: To establish the impacts of the proposed desalination plant on aquatic ecosystems and provide appropriate responses to potentially significant impacts.

64. The Pilot Study, Detailed Aquatic Ecology Monitoring Programme methodology proposed and submitted to the satisfaction of Council's Development Assessment Unit prior to commencement of construction and associated results shall be documented and submitted to Council's Development Assessment Unit at least once every four months.

Reason: To ensure Council's Development Assessment Unit is made aware of results of surveys and studies.

Terrestrial ecology

65. No clearing of native vegetation, apart from vegetation within the area proposed for the temporary desalination plant compound as shown in Appendix A of the Statement of Environmental Effects (dated September 2006), particularly dunal vegetation, is to occur unless approved by Council's Development Assessment Unit.

Reason: To protect the integrity of the dune system.

66. Works are to be restricted to the existing tracks and cleared area using temporary fencing and signage clearly identifying 'no-go' areas. All vehicles must be driven and parked in designated areas, not on vegetation or beneath the canopy of tall vegetation, unless the existing drip zone is paved or suitably sealed. Fencing to be in place and approved by Council's Development Assessment Unit prior to the commencement of construction.

Reason: To protect the integrity of the dune system.

67. Spread of weeds on site shall be minimised by minimising clearance of vegetation and ground disturbance and the application of suitable revegetation techniques in accordance with the Landscape and Rehabilitation Management Plan required by Condition 71. Ongoing control of weeds during construction shall be conducted in consultation with Council's Development Assessment Unit and shall include:

- (a) identification of noxious or other problematic weeds on site;
- (b) treatment of all weeds including identified noxious weeds; and
- (c) disposal of weeds as appropriate.

Reason: To avoid spread of weeds as a result of the works.

68. A **Pre-construction Shorebird Survey** of threatened birds is to be conducted a week prior to construction and results submitted to Council. The shorebird survey will target threatened and migratory species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The shorebird survey is to be conducted by a shorebird specialist. The Shorebird Survey must comprise a targeted survey for nesting shorebirds for five days in the week prior to commencement of construction.

Reason: To protect threatened shorebirds from any detrimental impact associated with the proposed works.

69. If the results of the pre-construction shorebird survey indicate that the study sites are a significant nesting habitat for shorebirds, then:
- (a) a referral shall be submitted to the Department of Environment and Heritage if impacts to Migratory Shorebirds listed under the *Environment Protection and Biodiversity Conservation Act 1999* are expected;
 - (b) where possible, construction shall occur between the months of March to August to avoid impacts to migratory shorebirds;
 - (c) an annual shorebird monitoring programme shall then be conducted for a minimum of two years following construction to assess construction and operational impacts; and
 - (d) if active wading birds nests are located and deemed by the shorebird specialist to be potentially impacted, then delaying the construction works at that site until the young have fledged will be necessary.

Reason: To minimise impacts on shorebirds (if found on or near subject site).

70. An outline of the proposed monitoring programme and results of the survey(s) shall be documented and submitted to the Council's Development Assessment Unit.

Reason: To ensure Council's Development Assessment Unit is adequately informed of potential impacts and to review mitigation measures proposed, as appropriate.

71. A **Landscape and Rehabilitation Management Plan** shall be prepared by a suitably qualified person (referred to as a 'landscape designer' for purposes of these conditions) that describes a strategy for suitable plantings using native species to minimise visual impact of the temporary desalination compound and for restoration of the site upon cessation of desalination operations. This Plan must be submitted to Council's Development Assessment Unit for approval prior to commencement of operations. The Tuggerah Beach Landscape and Rehabilitation Management Plan shall address, as a minimum:

- (a) landscaping along the Wilfred Barrett Drive (west) elevation to screen the compound from view from the roadway;
- (b) landscaping shall be undertaken using endemic native species sourced from local provenance (i.e. sourced within the local bio-region) in consultation with a suitably qualified rehabilitation specialist (e.g. Greening Australia);
- (c) landscaping shall be of suitable native species and maturity that, upon cessation of operations, will be integrated into a restoration planting regime that maintains or enhances the natural character of the site;
- (d) revegetation methods and materials to be used in each distinct area (i.e. coin matting and jute mesh and the like); and
- (e) ongoing maintenance of rehabilitated areas to ensure successful establishment of all plantings, which includes consideration of:
 - (i) watering requirements, including recycling and use of waste water;
 - (ii) replacement of dead or dying plants;
 - (iii) weed management; and
 - (iv) removal of seedling protection sleeves if appropriate.

Reason: To document an appropriate landscaping design and management regime.

72. The landscape designer must provide a compliance certificate to the Principal Certifying Authority certifying that landscaping has been implemented in accordance with the approved landscape plan, prior commencement of the use. Where Council is

not the Principal Certifying Authority, a copy of the certificate must be provided for Council's records.

Reason: To ensure landscaping works are properly completed.

73. During periods of high bush fire risk to the site a water tanker will be stationed on site for the purposes of fighting bush fires.

Reason: To protect the temporary desalination plant from the threat of bushfire, while minimising the need for clearing of vegetation.

74. The protection of significant vegetation retained on site by fencing or other accepted protection method in accordance with Council's Development Control Plan No 67 - *Engineering Requirements for Development*. Such protection measures must be installed prior to issue of construction certificate and maintained in good order for the duration of the works. No cement wastings, materials or vehicles are to be stored within the protective fence area.

Reason: To ensure protection of significant vegetation.

75. Any approved excavation or filling within a retained tree's canopy perimeter shall be in accordance with *Development Control Plan No 67 - Engineering Requirements for Development*, as excavation or filling can lead to tree instability or death.

Reason: To avoid significant impacts on trees.

76. The Applicant is to engage a suitably qualified and experienced consulting ecologist and coastal soil erosion consultant to supervise the construction of each stage of the development and to ensure and certify to Council's Development Assessment Unit that the trees and vegetation on the site are adequately retained, protected and, if necessary, rehabilitated during construction. Evidence of this engagement is to be forwarded to Council's Development Assessment Unit prior to the issue of a Construction Certificate. The consultant ecologist or arborist is to provide reports to Council's Development Assessment Unit for review certifying how the proposal is meeting tree retention and protection requirements following completion of the following stages of development:

- (a) following induction of each civil contractor and subcontractor;
- (b) following provision of services; and
- (c) following completion of each construction phase (including those stages involving delivery of containers and laying of pipelines through the dune).

Reason: To protect the integrity of the dune and dunal vegetation during construction.

77. Council's Development Assessment Unit is to be notified as soon as practicable (and not more than 24 hours after) if a significant breach of these ecological protection conditions occurs. A final certification of each stage of the development from the ecologist or arborist is to be forwarded to Council's Development Assessment Unit for review detailing the level of compliance with these ecological protection conditions and prior to the commencement of operation.

Reason: To allow Council's Development Assessment Unit to respond to potentially significant impacts on ecological habitats.

78. All services, including water and electricity, must be located, designed and installed to minimise or prevent root damage to retained trees and other dunal vegetation. Methods for the installation of services within the tree canopy perimeter are contained within *Development Control Plan No 67 - Engineering Requirements for Development* and include underboring or excavation by hand.

Reason: To minimise impact on vegetation.

Access, Transport and Traffic

79. A **Construction Traffic Management Plan (CTMP)** shall be prepared for the construction, decommissioning and restoration phases of the development to appropriately manage all vehicle movements (including use of car parking by public vehicles). This plan must be prepared by a suitably qualified person and submitted to Council as Roads Authority for approval prior to commencement of construction. All construction, decommissioning and restoration works must be conducted in accordance with this plan. The CTMP is to include measures for any works or deliveries that impact the normal travel paths of vehicles, pedestrians or cyclists or where any materials are lifted over public areas. The CTMP shall also include (but is not limited to):

- (d) details of the additional number of parking spaces that will not be available to the public during construction, based on the circulation and manoeuvring requirements of heavy vehicles visiting the site;
- (e) details of any temporary works that may be required within the car park and/or at the car park access intersection to facilitate access by heavy vehicles; and
- (f) temporary traffic management measures that would be employed to allow safe access and egress for construction vehicles and public vehicles at the car park access intersection.

If amendments to the CTMP are proposed these are to be approved by Council's Development Assessment Unit prior to commencement of the decommissioning phase.

Reason: To minimise impact on car park users during the construction and decommissioning phases and provide for safe access to the site for all vehicles.

80. Prior to construction, the car park pavement shall be investigated to determine whether it will withstand construction and service movements. Evidence is to be provided to the satisfaction of Council's Development Assessment Unit prepared by a suitably qualified person. Should the pavement be deemed unsuitable, works shall be carried out by the proponent to make the surface suitable for expected vehicle movements and works.

Reason: To maintain adequate car park surfacing.

81. All works within a public road must be approved by Council under the *Roads Act 1993* as the Roads Authority. The Roads and Traffic Authority must provide its concurrence for each specific change to Wilfred Barrett Road as a classified road prior to commencement of any work.

Reason: To provide for safe access to the site for all vehicles and to advise the requirements of other approval bodies (NSW RTA).

82. A Community Liaison Plan is to be submitted as part of the CTMP that addresses matters such as public notification of noisy activities, temporary disruptions to access, alternative parking arrangements and complaints monitoring and management.

Reason: To keep the community informed of construction progress and minimise disruptions.

83. The entry/exit driveway width and internal road configuration is to be designed and constructed in accordance with AS 2890.2:2002: "Commercial Vehicle Facilities" so as to accommodate the swept turning path of the largest design vehicle accessing the development.

Reason: To provide for safe access to the site for all vehicles and to advise the requirements of other approval bodies (NSW RTA).

84. On site vehicular turning facilities are to be provided to enable all vehicles to exit the site in a forward direction.

Reason: To provide for safe access to the site for all vehicles and to advise the requirements of other approval bodies (NSW RTA).

85. Internal access and all parking facilities, where appropriate, are to be designed and constructed in accordance with Wyong Shire Council's DCP No. 61: Car parking and AS/NZS 2890.1:2004 Part 1: "Off-Street Car Parking". Certification of the design by a suitably qualified consultant is to be provided to Council prior to issue of the Construction Certificate.

Reason: To provide for safe access to the site for all vehicles and to advise the requirements of other approval bodies (NSW RTA).

86. Appropriate site works are to be constructed across the street frontage so as to comply with the minimum sight distance requirements and minimum sight lines for pedestrian safety set out in the RTA publication "Guide to Traffic Generating Developments" (1993) and AS/NZS 2890.1:2004 Part 1: "Off-Street Car Parking".

Reason: To provide for safe access to the site for all vehicles and to advise the requirements of other approval bodies (NSW RTA).

Note to condition: This condition does not affect Condition 65, which requires not clearance of vegetation.

87. No reliance is to be given to on-street parking on Wilfred Barrett Drive in the determination of parking needs relating to the proposed development.

Reason: To maintain safe operation of vehicle movements on Wilfred Barrett Road and to advise the requirements of other approval bodies (NSW RTA).

88. If any ground is to be disturbed, sediment control measures, in accordance with the RTA Road Design Guide (Section 8), Landcom publication "Managing Urban Stormwater – Soils and Construction" 4th edition March 2004 (reprinted July 2006) Volume1 or Council's internal policy documents shall be incorporated in any future consent.

Reason: To maintain safe operation of vehicle movements on Wilfred Barrett Road and to advise the requirements of other approval bodies (NSW RTA).

89. Upon cessation of operations, the site shall be restored to pre-development conditions including re-establishment of the car park surface, line marking and any landscaping removed during the construction or operation phases must be replaced.

Reason: To minimise the long term impacts of the temporary desalination plant on the existing car park and vegetation.

Acoustic

90. All recommendations contained in the acoustic report *Acoustic Assessment for Proposed Temporary Desalination Plans North Entrance Peninsula, Wyong Shire*, prepared by Hunter Acoustics, dated 28 August 2006 (Report Ref Desalination plants assessment report Final.doc), accompanying the application, which requires specialised acoustic treatment in which the use must operate, shall be complied with.

Reason: To ensure reasonable acoustic amenity for surrounding properties is maintained and to ensure compliance with the appropriate noise criteria, which is that noise from the operation of the desalination plant must not exceed 40 dB(A) at the nearest residence and 50 dB(A) at a distance of 50m from the plant site boundary.

Air quality

91. Appropriate measures shall be employed during demolition, excavation and construction works to prevent the emission of dust and other impurities into the surrounding environment. All such measures shall be co-ordinated with site sedimentation controls to ensure polluted waters do not leave the site.

Reason: To minimise potential for air quality impacts.

92. A **Construction Air Quality Management Plan** must be prepared as part of the Construction Environmental Management Plan that includes appropriate management measures to minimise the impacts of air borne emissions.

Reason: To formulate and implement appropriate air quality mitigation measures.

93. A degassifier must not be used.

Reason: To avoid potential for significant impacts to air quality.

Heritage

94. A **Cultural Heritage Management Plan** (CHMP) must be prepared by a suitably qualified person and be submitted to Council's Development Assessment Unit for approval prior to commencement of construction, addressing the following key matters:
- (a) the relevant mitigation measures listed in the Statement of Environmental Effects, prepared by Connell Wagner (dated 28 September 2006);
 - (b) a schedule for further consultation with the Darkinjung LALC that identifies their role in the construction process;
 - (c) detailed site history information for the subject land that, as far as possible, accurately describes the extent and location of impacts due to previous land uses (with the intent of focusing management activities in lesser disturbed areas, should they be present);
 - (d) a site inspection to 'ground truth' the absence of Aboriginal objects; and
 - (e) documentation of risk management processes and responses (including the need for statutory permits) should any Aboriginal objects be encountered during construction.

Reason: To minimise potential for impacts on Indigenous heritage values.

95. If Aboriginal objects are encountered during construction, all work is to cease immediately and the National Parks and Wildlife Service must be notified. Works may only recommence following endorsement for such from the National Parks and Wildlife Service.

Reason: To preserve Indigenous heritage values.

Visual impact

96. All finishes are to be non-reflective and of recessive colouring to minimise impacts on the surrounding visual landscape.

Reason: To minimise visual impacts by matching as far as practical the natural tones of the surrounding environment.

97. Chain wire mesh fencing shall be coloured black.

Reason: To minimise visibility of fencing.

98. Any signage shall be of simple design and must reflect the character of the site. This condition does not apply to any sign that is required as a warning sign for public safety.

Reason: To avoid signage that causes visual clutter or is contrary to the character of the coastal area, while allowing signage required for managing public safety to be clearly visible.

99. No advertisement shall be erected on or in conjunction with the development.

Reason: To avoid advertising that is inappropriate in the coastal area.

100. All signage must be maintained in a presentable and satisfactory state of repair.

Reason: To maintain visual quality.

101. All lighting shall be designed so as to ensure that glare does not adversely impact upon any adjoining property. No lighting shall be established outside the fenced temporary desalination plant compound. Lighting shall be low level and directed down and towards the centre of the compound to avoid light spillage.

Reason: To avoid lighting impacts on surrounding areas.

Social Impact in the Locality

102. A dedicated webpage must be established as soon as practical after approval of this development application and prior to issue of a construction certificate that provides publicly available information regarding the development. The contents of the web page shall also be available in hard copy newsletter format at Council's offices and public library. The web page shall contain information of relevance to the project, including updates on construction, monitoring data and investigations in to water supply and efficiency measures.

Reason: To inform the community of progress and promote community ownership of the works.

Note to condition: Use of existing web page or web site would comply with this condition, provided the information presented is clear and conveniently accessed by the public.

103. A free call telephone number shall be operated by the proponent during construction, operation and decommissioning. All advertising material produced shall contain reference to a free call number. A suitably qualified communications person is to be responsible for responding to telephone enquiries.

Reason: To allow the community to comment on progress and provide input into ongoing management of the facility.

104. Signage is to be located adjacent to the compound that clearly communicates the temporary nature of the facility.

Reason: To communicate the purpose of the facility to non-residents.

Safety, Security and Crime Prevention

105. A 24 hour free call telephone number shall be maintained for the duration of the project (combined for all three sites) that allows the public to report damage or incidents directly to the desalination plant operator or the Police. This number must be displayed near the site and on newsletters, internet and other advertisements.

Note to Condition: Public must be notified to call emergency services (000) for major incidents or emergencies.

Reason: To facilitate rapid response to incidents.

106. A **Risk and Safety Management Plan** shall be prepared and submitted to Council's Development Assessment Unit for approval prior to commencement of construction and/or investigation works to the east of the crest of the foredune (including subsurface and surface infrastructure associated with beach wells and seawater return). The Plan shall demonstrate adequate consideration of risks associated with the temporary

desalination plant and identify actions to implement measures to minimise those risks. In particular, the Plan shall consider (but not limited to):

- (a) measures to protect public safety in the event of further exposure of beach infrastructure, including seawater outlet infrastructure and sand bags;
- (b) measures to protect public safety in the event of seawater outlet burial (which may result in beach liquefaction in the vicinity of the outlet); and
- (c) pro-active monitoring of predicted ocean storm conditions to ensure timely response to events where infrastructure is exposed on the beach.

Note to Condition: Visibility of infrastructure and potential for injury are important considerations to be managed by the Risk and Safety Management Plan.

Reason: To avoid, reduce or manage risks associated with the temporary desalination plant.

107. The Risk and Safety Management Plan must be prepared by persons who have suitable experience in assessing risk of the nature presented by the proposed development (including public safety). The process for formulating the Risk and Safety Management Plan must include a safety and risk workshop, which is to include participation by:

- (a) the operator;
- (b) Council (if different from operator);
- (c) person(s) suitably qualified in assessing risk;
- (d) key stakeholders (e.g. Surf Club);
- (e) construction groups; and
- (f) a suitably experienced facilitator (can be the risk specialist if appropriate).

The findings of this workshop (including risk identification and suitable mitigation measures) shall be incorporated into the Risk and Safety Management Plan prior to submitting the Plan to Council's Development Assessment Unit for approval (in accordance with Condition 106).

Note to condition: As only typical details are provided with the application, a preliminary workshop using typical details would necessitate a follow-up workshop to clarify risks identified once detailed engineering and construction issues are more highly understood.

Reason: To ensure all reasonable mitigation measures are included in the Risk and Safety Management Plan and to ensure measures are site-specific.

108. The Construction Environmental Management Plan must provide for the safety of beachgoers during the construction period. The Plan must include provision of a hoarding or safety fence between the work site and the public place in accordance with Work Cover Authority requirements, for the duration of the project.

Reason: To minimise potential for risks to public safety during construction.

109. Construction will be conducted using progressive drilling and restoration of the beach areas, starting from the northernmost well and progressing south.

Reason: To minimise extent of worksites during construction.

Utilities

110. The impact on the local electricity network of the additional load from the plant and cumulatively across all three sites is to be determined and actions implemented to minimise adverse impacts on network losses. Such actions are to be documented in the Construction Environmental Management Plan.

Reason: To minimise network losses.

111. A comprehensive services search is to be carried out before any construction and/or investigations to identify any services that may be impacted and appropriate measures undertaken to avoid damage to such services.

Reason: To avoid damage to existing services.

112. Any services that are required to connect to the western side of Wilfred Barrett shall be bored or jacked under Wilfred Barrett Road.

Reason: To avoid disturbing the road surface of Wilfred Barrett Road.

113. Backwash from the Desalination Plant shall not be discharged to the ocean.

Reason: To avoid the potential for water quality impacts resulting from backwash discharge.

114. A Trade Waste Agreement must be obtained from Wyong Shire Council prior to commissioning of the Desalination Plant.

Reason: To manage the level of trade wastes being discharged to sewer.

115. Contingency measures shall be identified within the Trade Waste application to implement appropriate mitigation measures in the event that the discharge to sewer exceeds the approved Trade Waste Agreement limits.

Reason: To manage the level of trade wastes being discharged to sewer.

Hazardous materials and waste

116. Storage of chemicals on site shall be in accordance with the following requirements:

- (a) EPA's (DEC) *Bunding and Spill Management Guidelines contained within the EPA Environmental Protection Manual for Authorised Officers*;
- (b) *Occupational Health and Safety Regulation 2001 (as amended)*;
- (c) *WorkCover NSW Code of Practice for the Storage and Handling of Dangerous Goods 2005*; and
- (d) Appropriate Australian Standards, in particular *AS 3780 – The Storage and Handling of Corrosive Substances*, and *AS/NZS 4452 The Storage and Handling of Toxic Substances*.

Reason: To minimise potential for spills and other risks associated with storage of chemicals.

117. A **Spill Control Plan** shall be developed and implemented as part of the Environmental Management Plan for both the construction and operational phases of the project.

Reason: To enable effective response to chemical spills.

118. An **Emergency Response Management Plan** must be prepared and submitted to Council's Development Assessment Unit for approval prior to the commencement of construction. The Plan shall include the following:

- (a) list of chemicals and maximum quantities to be stored at the site;
- (b) identification of potentially hazardous situations;
- (c) procedure for incident reporting;
- (d) details of spill stations and signage;
- (e) containment and clean-up facilities and procedures; and
- (f) the roles of all staff in the Plan and details of staff training.

Reason: To enable effective response to chemical spills and other incidents.

119. Stormwater shall be prevented from entering any areas where it may become contaminated.

Reason: To minimise potential for chemical contamination.

120. Cleaning using water, detergents, solvents, caustics or acids must not be carried out where untreated wastes can enter waterways.

Reason: To minimise potential for chemical contamination.

121. Adequate quantities of suitable material such as sand to contain spillage, will be readily available on site.

Reason: To minimise potential for chemical contamination.

122. Chemical, fuel and lubricant storage areas would be suitably located and protected to minimise impacts from spills or overland flow during extreme rainfall events.

Reason: To minimise potential for chemical contamination.

123. A **Waste Management Plan** shall be developed as part of the Construction and Operational Environmental Management Plans for both the construction and operational phases, respectively, and submitted for approval of Council's Development Assessment Unit prior to commencement of construction.

Reason: To appropriately manage waste generated by the development during construction, operation and decommissioning.

124. Compliance with the Waste Management Plan submitted with the application, or as modified by Council's Development Assessment Unit, in accordance with Development Control Plan No 69 - *Controls for Site Waste Management*.

Reason: To advise of the requirements of approval bodies.

125. Sealed waste bins shall be provided for site waste during construction and operation to discourage animal pests.

Reason: To discourage animal pests.

Attachments

- General Terms of Approval stipulated by the NSW Department of Primary Industries (Fisheries), dated 6 October 2006 (Permit No. 06/293).
- General Terms of Approval stipulated by the Mine Subsidence Board, dated 13 October 2006 (Reference: Building Application No BA06-2506W5).
- General Terms of Approval stipulated by the NSW Department of Natural Resources, dated 21 November 2006.

ATTACHMENTS TO CONDITIONS – GENERAL TERMS OF APPROVAL



16 October 2006

Wyong Shire Council
PO Box 20
Wyong, NSW, 2259

Dear Council,

RE: Permit for dredging and reclamation works at a desalination plant at Tuggerah Beach

Please find enclosed a permit under Part 7 of the Fisheries Management Act 1994 for works the installation of a temporary weir in an existing culvert structure at Porters Creek, Wyong.

Please carefully read and note the conditions included in the permit. **If you agree that all the conditions are reasonable, appropriate and achievable, you must sign and date the attached sheet (Acceptance of Conditions) and return it to the Contact Officer as soon as possible. If you believe that you cannot comply with all the conditions then you must not commence work.** Instead, you should contact the Contact Officer listed on the first page of the permit so that your concerns can be considered.

If you intend to have the work undertaken by a contractor, please ensure that the contractor receives a full copy of the permit and understands the importance of abiding by the conditions. As the permit holder, Council are responsible for ensuring that all conditions are fully adhered to. **Breaching a condition of a permit may incur a \$200 on-the-spot fine under the provisions of Clause 337A of the Fisheries Management (General) Regulation 2002.**

The extent of work is to be restricted to that outlined in the application and plans submitted to the Department. If for any reason, other works are required, or the works need to be extended to other areas, you must seek specific approval beforehand. We will require information as to why these variances are required.

The Department of Primary Industries places particular importance upon the need to minimise the harm to the natural environment both at the work site and downstream. We expect implementation of Best Management Practice with respect to erosion and sediment control. This includes aspects of:

- work scheduling (eg installation of protective measures before earthworks commence, suspension of works during rain etc),
- deployment of protective measures (eg site drainage, separation of "clean" and "dirty" water, silt stop fencing, hay bales, sediment traps etc) and
- constant maintenance of those measures (eg replacing torn silt-stop fencing, replacing silt-stop fencing which has fallen down or been knocked over, removing accumulated sediment etc) including overnight and weekends.

If you have any queries please call me on 0419 185 508.

Yours faithfully

Scott Carter
Senior Conservation Manager

Cc: Warren Winter DFO/Hunter
Micheal Piontek FO/Hunter



**Acceptance of Conditions specified in Permit No. 06/291 issued
under Part 7 of the Fisheries Management Act 1994**

In reference to Permit No. 06/291

I the undersigned, acknowledge that I have read and understood and agree to comply with the conditions specified. I understand that penalties can be imposed for non compliance with conditions.

Permittee's name: _____

Permittee's signature: _____

Date: _____

Please mail or fax to:

Scott Carter
Port Stephens Fisheries Centre
Locked Bag 1
Nelson Bay NSW 2315
Phone 4982 1232
Fax 4982 1107



**Permit under Part 7 of the
FISHERIES MANAGEMENT ACT 1994**

Permit Number: 06/291

Permit Holder: Wyong Shire Council
PO Box 20
Wyong, NSW, 2259
Phone (02) 4350 5555

Permit Area: Tuggerah Beach - Magenta

Permit Activity: Dredge and reclamation works associated with construction of brine dissipator pits at Tuggerah Beach , Magenta as proposed in your application of 25th July 2006.

Contact Officer: Scott Carter
Port Stephens Fisheries Centre
Locked Bag 1
Nelson Bay NSW 2315
Phone 4982 1232
Fax 4982 1107
Mobile 0419 185 508
Email scott.carter@dpi.nsw.gov.au

**Unless cancelled or suspended sooner, this permit shall remain in force until:
3rd August 2008.**

This permit is subject to the following conditions:

1. The completed **Acceptance of Conditions** form must be returned to the nominated Contact Officer before any works commence.
Reason – To remove any doubt that the Permittee understands and accepts the Conditions before work commences.
2. The Fisheries Officer at Swansea (Phone 4971 1201, fax 4971 2986, mobile 0419 185 524) **and** the Contact Officer (contact details listed above) are both to be notified at least three (3) days BEFORE the commencement of works.
Reason - To ensure that local Department of Primary Industries (DPI) staff are aware that works are about to commence.
3. The Fisheries Officer at Swansea (contact details listed above) **and** the Contact Officer (contact details listed above) are to be notified at least three (3) days BEFORE works are complete or machinery is removed from the site.
Reason - To provide an opportunity for local Department of Primary Industries (DPI) staff to inspect the site whilst machinery is still on site and available to do any remedial work that may be necessary.
4. The permit holder must ensure that all works associated with this permit are restricted to the permit area and are undertaken in a manner consistent with those described in the application made to Department of Primary Industries dated 25th July and the Review of Environmental Factors. In particular, all the safeguards listed in the application and REF are to be implemented. Other works, which have



not been described, are not to be undertaken.

Reason – This permit has been granted following an assessment of the potential impacts of the described works upon the aquatic and neighbouring environments. Other works, which were not described in the application have not been assessed and may have significant adverse impacts.

5. This permit (or a true copy) must be carried by the permit holder or sub-contractor operating on-site at all times during work activity in the permit area.
Reason – A Fisheries Officer may wish to check compliance of works with imposed conditions.
6. Erosion and sediment mitigation devices are to be erected in a manner consistent with currently accepted Best Management Practice to prevent the entry of sediment into the waterway prior to any earthworks being undertaken. These are to be maintained in good working order for the whole duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal.
Reason – To ensure that sediment generated by the exposure of soil is not transported into the main water body.
7. On completion of the works the site is to be rehabilitated and stabilised. Surplus construction materials and temporary structures (other than silt fences and other erosion and sediment control devices) installed during the course of the works are to be removed.
Reason – To ensure that habitats are restored as quickly as possible, public safety is not compromised and aesthetic values are not degraded.
8. Machinery is not to enter, or work from the waterway unnecessarily.
Reason – To ensure minimal risk of water pollution from oil or petroleum products and to minimise disturbance to the streambed substrate.
9. Works are to be conducted during periods of low river flow. If water levels rise, work is to be suspended until levels fall again.
Reason – To minimise the potential for erosion and transport of soil and other material into the water body.
10. No snags (large woody debris) are to be removed, realigned or relocated without first consulting the contact officer.
Reason – “Removal of large woody debris” is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994. This approval has been granted on the basis that snags are not to be removed.
11. Damage to riparian vegetation is to be minimised and any damage caused is to be restored.
Reason – “Decline in native riparian vegetation” is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994. This approval has been granted on the basis that riparian vegetation will not to be removed or degraded.
12. The Department of Primary Industries is to be notified immediately if any fish kills result from the works. In such a case all works are to cease until the issue is rectified and approval is given to proceed.
Reason – The Department of Primary Industries needs to be aware of fish kills so that it can assess the cause and mitigate further incidents in consultation with relevant authorities. They are also potentially contentious incidents from the public



perspective. Work practices may need to be modified to reduce the impacts upon the aquatic environment.

IMPORTANT NOTE:

A Fisheries Officer who has reasonable cause to suspect that the conditions of this permit have not been complied with, may order the work to stop immediately. The order may be given to the permit holder or any person who informs the officer that they are acting in any capacity on behalf of the permit holder. Any damage caused to the habitat outside the specified permit area, or the carrying out of works not in accordance with the conditions specified and agreed to in the application, could result in a breach of the *Fisheries Management Act 1994 or Regulations*, and penalties of up to \$110,000 may apply. Orders may also be made requiring work to rectify any damage caused by unauthorised works. Failure to abide by one or more Conditions may incur a \$200 on-the-spot fine pursuant to clause 337A of the Fisheries Management (General) Regulations.

A handwritten signature in black ink, appearing to read 'Scott Carter'.

Scott Carter
SENIOR CONSERVATION MANAGER
Authorised delegate of the Minister for Primary Industries
16 October 2006



NSW Government

DEPARTMENT OF NATURAL RESOURCES

Contact: Andrew Philippa
Phone: (02) 4904 2500
Fax: (02) 4904 2503
Email: andrew.philippa@dlwc.nsw.gov.au

Our Reference: ER7081, ER7081A, ER7081B,
ER7081C

Your Reference: DA 1665/2006, DA 1667/2006 and
DA 1668/2006

Wyong Shire Council
PO Box 20
Wyong NSW 2259

Attention: Danielle Dickson

21 November 2006

Dear Danielle,

Subject: DA 1665/2006, DA 1667/2006 and DA 1668/2006, Temporary Desalination Plants.

With respect to correspondence of 9 October 2006, the Department has considered the documentation submitted in support of the development applications (DA1665/2006, DA1667/2006 and DA1668/2006). The Department has two areas of responsibility in these matters, namely activities that will require a licence under Part 5 of the Water Act 1912 for the extraction of groundwater, and potential impacts on the Coastal Environment as determined by a hazard assessment and possible application of the Coastal Protection Act 1979.

Water Act 1912.

The assessment of the activity as proposed has found that licences under the Water Act would be required. Please find attached General Terms of Approval for the proposed desalination plants.

Coastal Protection Act 1979.

Ministers Concurrence.

The Department of Natural Resources advised the Minister for natural Resources of his concurrence role under the Coastal Protection Act 1979. In this instance a review of the proposed works as set out in the concept drawing provided with the relevant development application shows that the Minister for Natural Resources has no role in determining concurrence for the activities as proposed. This is best explained as follows;

The regulation applies to the offshore marine water of the state below the open coast mean high water mark. However, the provisions of a regulation made pursuant to section 39(2) Coastal Protection Act, 1979 do not apply in respect of an area that is subject to an environmental planning instrument within the meaning of the Environmental Planning and Assessment Act 1979. Of relevance here is that the Wyong LEP (1991) applies to all land within the local government area of Wyong, which pursuant to clause 205, Local Government Act 1993, extends to the low water mark.

Therefore this project if it remains consistent with the conceptual drawings submitted for review, do not trigger the need for Ministers concurrence.

General Comments.

At present the Department of Natural Resources which also has the responsibility for providing advice on coastal hazards, is still assessing this aspect to the proposed works. When that assessment is complete, comments will be forwarded to Council as a matter of priority.

With respect to the licences for groundwater works associated with the desalination plants, if development approval occurs, upon written notification of the approval, the Department will be able to finalise those applications and issue the licences within a short timeframe thereafter.

Should you have any further questions concerning this correspondence, please do not hesitate to contact Andrew Philippa in the first instance on 4904 2562.

Yours sincerely

Mark Mignanelli

Newcastle



**ER7081, ER7081A, ER7081B, ER7081C, Wyong Shire Council
Temporary Desalination Plants, Tuggerah, Budgewoi and Magenta
Part 5 of the Water Act 1912.**

GENERAL TERMS OF APPROVAL

For a Licence pursuant to Part 5 of the Water Act 1912

Standard

1. The general terms of approval (GTA) relate to the above development within the proposed development site.
2. The GTA do not constitute an approval under the *Water Act 1912 (WA)*.
3. If the consent authority determines to grant consent, the GTA are to form part of the development consent.
4. Any amendments to the development application may void these GTA.
5. The approval holder must submit, to Department of Natural Resources (DNR) Newcastle Office, a completed application form for a licence under Part 5 of the *WA* prior to the commencement of any development / works.
6. The licence application is required to accord with the GTA.

Note: Construction Project Schedules should make provisions for time for the processing of licence applications.

Licence Application

7. The approval holder must provide the following with the licence application:
 - a) A copy of the development consent.
 - b) A copy of approval from the Department of Environment and Conservation under the *Protection of the Environment Operations Act 1997* for discharge of brine/hyper saline water,
 - c) A licence fee of \$151 for each licence application (by cheque made out to DNR).

Relevant Plans and Documents

8. The approval holder must ensure that approved works are completed in accordance with the concept drawings attached to the Statement of Environmental Effects (SEE) relevant to each development application.

Works

9. The approval holder must ensure that bore/s are constructed in accordance with *Minimum Construction Requirements for Water Bores in Australia* (Agriculture and Resource Management Council of Australia and New Zealand : Edition 2 Revised September 2003).

10. The approval holder must ensure that all drilling operations are carried out by a licensed driller.

11. The approval holder must, within two (2) months of completion or after the issue of the licence if the work is existing, furnish to DNR:

- a) Details of the work as set out on Form "A" attached to the licence.
- b) A plan showing accurately the location of the work in relation to property boundaries.
- c) Details of any water analysis and/or pumping tests.

12. The approval holder must allow DNR, or any duly authorised officer, unrestricted access to the works either during or after construction, for the purpose of carrying out any inspection or test of the works and its fittings.

13. The approval holder must carry out any work or make any alterations deemed necessary by DNR, for the protection or proper maintenance of the works, or for the control of the water extracted or prevention of pollution of groundwater.

14. If a work is abandoned at any time, the approval holder must notify DNR that the work has been abandoned and seal off the aquifer by:

- a) casing (lining) to the satisfaction of DNR; or
- b) such other methods as agreed to or directed by DNR.

15. The approval holder must ensure that works for the purpose of conveying, distributing or storing water are designed, constructed and operated to minimise obstruction to the passage of floodwaters flowing in, to, or from a stream, river or lake.

16. The approval holder must ensure that tailings or other materials are prevented from being washed into any stream, river or lake.

17. The approval holder must ensure that water is not pumped from the bore(s) for any purpose other than purpose authorised by the licence.

18. The approval holder must notify DNR of any proposed changes or modification to operations (eg. rate or duration of pumping).

Monitoring

19. The approval holder must install, to the satisfaction of DNR in respect of location, type and construction, an appliance(s) to measure the quantity of water extracted from the works. The appliance(s) is to consist of either a measuring weir(s) with automatic recorder, meter(s) or means of measurement approved by DNR.

20. The approval holder must ensure that the appliance(s) is maintained in good working order and condition.

21. The approval holder must ensure that a record of all water extracted from the works is formally maintained and supplied to DNR upon request.

22. The approval holder must provide a test certificate as to the accuracy of the appliance(s), prepared to a professional standard by an appropriately qualified person, is provided to DNR upon request.

23. The approval holder must maintain water quality records for the bore and provide reports to DNR upon request.

24. The approval holder must undertake remedial action if monitoring results indicate that the agreed standards or performance indicator levels are not being achieved due to failure or ineffectiveness of the management strategies.

Advisory Notes

1. For the purpose of the GTA, the term approval holder refers to the applicant for the integrated development application.

2. A licence will not give the approval holder the right to use and occupy any land without the consent of the registered owner/s of the property.

3. A licence will not relieve the approval holder of any obligations or requirements of any other acts, regulations, planning instruments or Australian standards.

In reply please send to: **Wyong**
Our reference: **FN73-01438W0 TH:LB**
Your reference: **DA/1665 &1667/2006**
Contact: **Tom Hole 43 521646**

Wyong Shire Council
DX 7306
WYONG

13 October 2006

Dear Sir

BUILDING APPLICATION NO BA06-2506W5
TEMPORARY DESALINATION PLANTS

The following Temporary Desalination Plants are proposed to be located within the Swansea/North Entrance Mine Subsidence District:

- Site 1 - Tuggerah Beach – is not within a Mine Subsidence District
- Site 2 – Budgewoi Beach
- Site 3 – Lakes Beach

The Mine Subsidence Board has granted approval for the erection of improvements and services in relation to the desalination plants on the following conditions:

1. All improvements being temporary in nature, sited at the locations for a two year period ending in January 2009.
2. Any permanent structures/services or the retention of the temporary structures/services after January 2009, would be the subject of a separate application. Approval would be considered at the time of submission and may be subject to design requirements.

Yours faithfully


T Hole
District Manager



HEAD OFFICE:

PO Box 488G
Newcastle 2300
Telephone: (02) 4908 4395
Facsimile: (02) 4929 1032

NEWCASTLE:

NSW Government Offices
117 Bull Street
Newcastle West 2302
PO Box 488G
Newcastle 2300
Telephone: (02) 4908 4300
Facsimile: (02) 4929 1032
DX 4322 Newcastle West

SPEERS POINT

143 Main Road
Speers Point 2284
PO Box 9 Boolaroo 2284
Telephone: (02) 4950 8088
Facsimile: (02) 4950 8101
DX 7820 Newcastle

WYONG:

Suite 3 Feldwin Court
30 Hely Street
Wyong 2259
PO Box 157 Wyong 2259
Telephone: (02) 4352 1646
Facsimile: (02) 4352 1757
DX 7317 Wyong

SINGLETON:

Coal Services Building
1 Civic Avenue
Singleton 2330
PO Box 524 Singleton 2330
Telephone: (02) 6572 4344
Facsimile: (02) 6572 4504

PICTON:

100 Argyle Street
Picton 2571
PO Box 40 Picton 2571
Telephone: (02) 4677 1967
Facsimile: (02) 4677 2040
DX 26053 Picton

EMAIL:

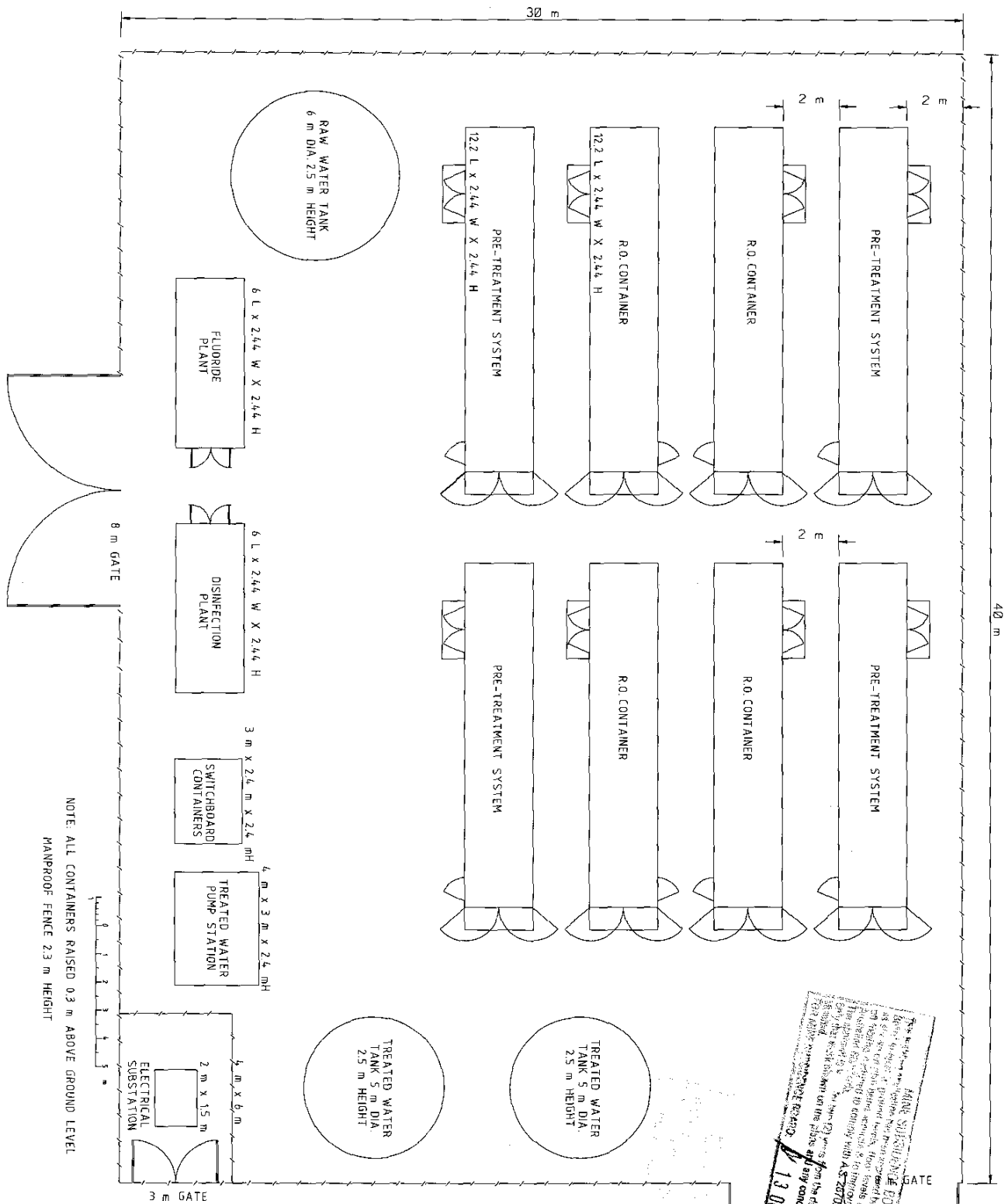
mail@minesub.nsw.gov.au

WEBSITE:

www.minesub.nsw.gov.au

I:\office files\ba06-2506w5 andrews neil (desalination plants).doc

473	0	ISSUED FOR REVIEW	DETAILS OF ARCHITECTS	ISSUED DATE
474	1	AS PER COMMENTS	DETAILS OF ARCHITECTS	ISSUED DATE
MICHAEL COOLES-PROCTOR Senior General - New Department of Commerce SUSTAINABLE WATER SOLUTIONS LEVEL 2/241 MARION PLACE SYDNEY NSW 2000 PHONE: 61 61 92372800 FAX: 61 61 92372877				
Name of Firm: MICHAEL COOLES-PROCTOR Project: WYONG SHIRE COUNCIL Client: WYONG SHIRE COUNCIL Designer: MICHAEL COOLES-PROCTOR Date: 13 OCT 2006				
WYONG SHIRE COUNCIL TEMPORARY DESALINATION PLANT TYPICAL 4 MW/D TEMPORARY DESALINATION PLANT LAYOUT				
Project No: 005 Issue No: 1 Revision: 1				



APPROVED FOR CONSTRUCTION
 13 OCT 2006
 The undersigned hereby certifies that the plans, specifications and conditions of approval for the above project have been approved by the Council of the Shire of Wyong on 13 October 2006. This approval is given on the basis that the applicant has provided all necessary information and that the project complies with the relevant provisions of the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000.

NO.	REVISION	DATE
1	ISSUED FOR REVIEW	

CONCEPT DESIGN

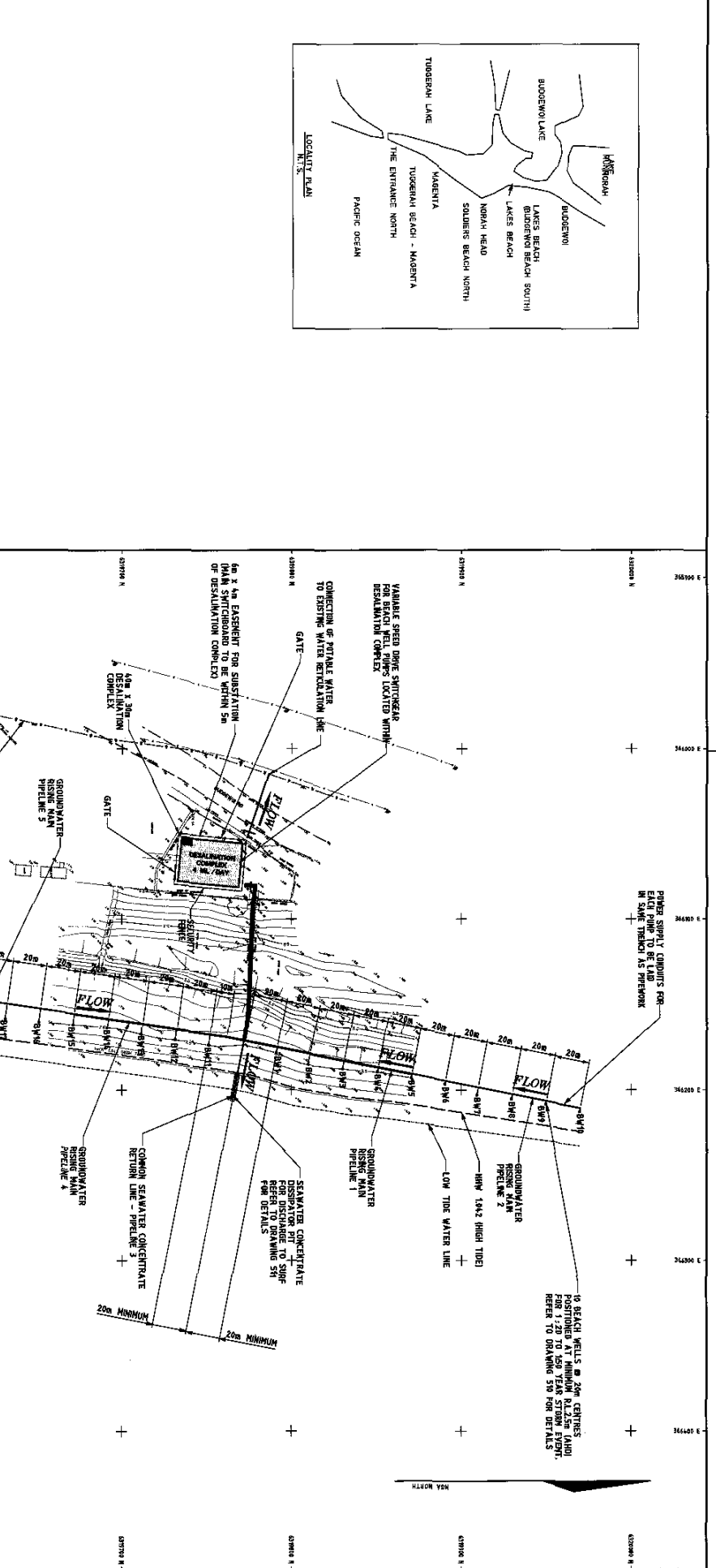
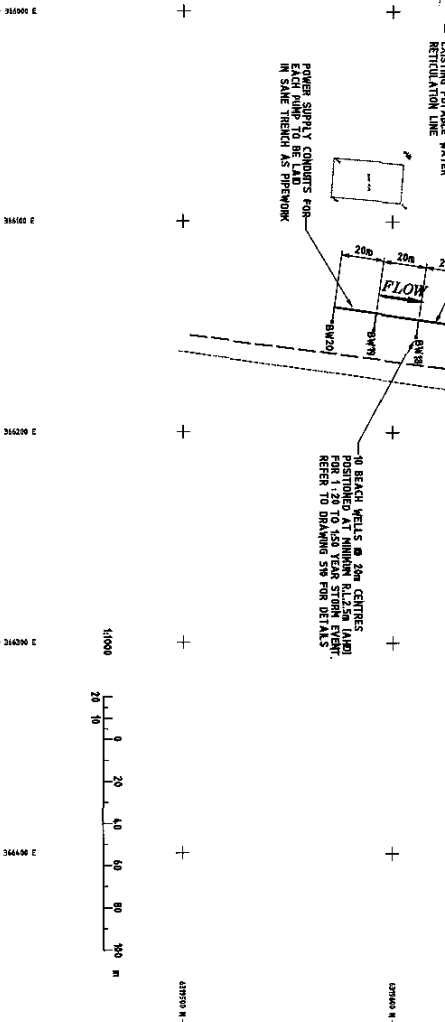
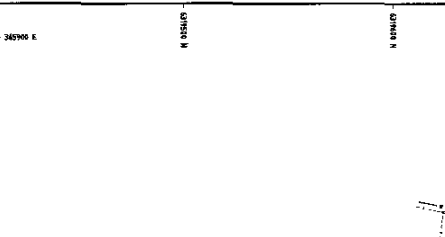
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CHECKED BY	CHAD COATES
DATE	15/09/06
PROJECT TITLE: WYONG LAKES BEACH DESALINATION UNITS	
CLIENT: WYONG COUNCIL	
DRAWING NO: WYONG-503	

PROJECT NO.	WYONG-503
SCALE	1:200
DATE	15/09/06
DRAWN BY	CHAD COATES
CHECKED BY	CHAD COATES
DATE	15/09/06
PROJECT TITLE: WYONG LAKES BEACH DESALINATION UNITS	
CLIENT: WYONG COUNCIL	
DRAWING NO: WYONG-503	

PROJECT NO.	WYONG-503
SCALE	1:200
DATE	15/09/06
DRAWN BY	CHAD COATES
CHECKED BY	CHAD COATES
DATE	15/09/06
PROJECT TITLE: WYONG LAKES BEACH DESALINATION UNITS	
CLIENT: WYONG COUNCIL	
DRAWING NO: WYONG-503	

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STATION	EASTING	NORTHING	HEIGHT	DESCRIPTION
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STN 2B	241664.135	641724.538	2.174	FLUSH CONC. STAIN GRAVE

SYMBOL	DESCRIPTION
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[Symbol]	DESALINATION UNIT
[Symbol]	DESALINATION UNIT
[Symbol]	DESALINATION UNIT

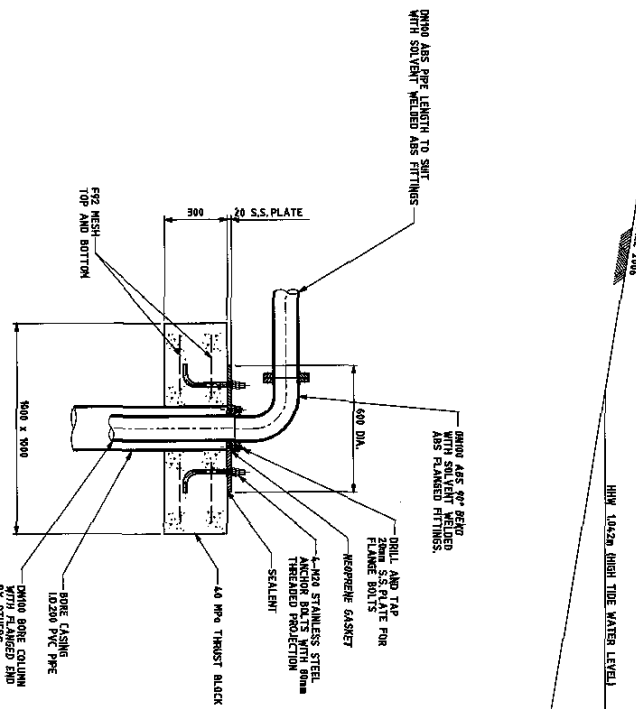
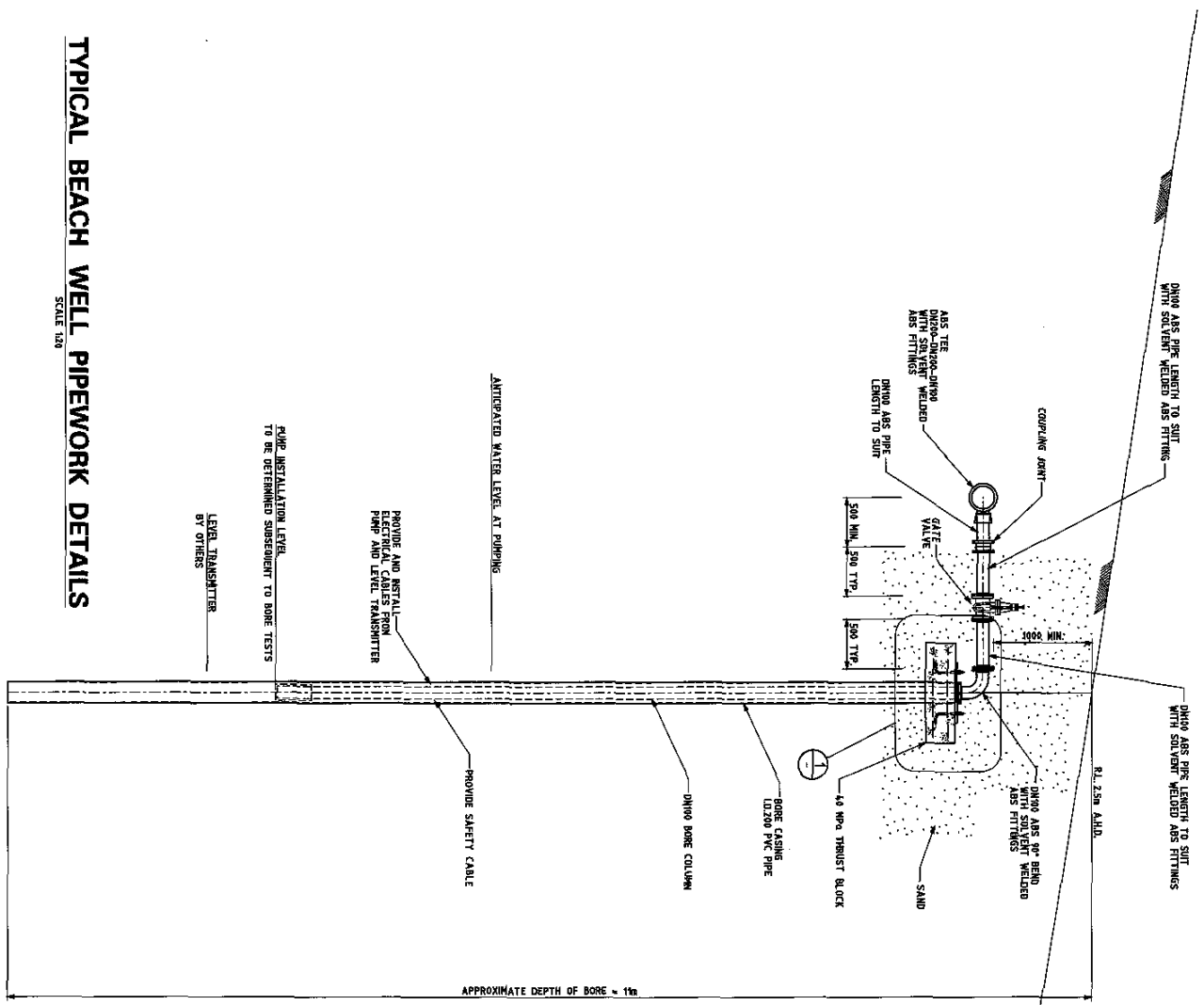


3	ISSUED FOR REVIEW		
4	ISSUED FOR CONSTRUCTION		
5	ISSUED FOR ASSEMBLY		
6	ISSUED FOR INSTALLATION		

TYPICAL BEACH WELL PIPEWORK DETAILS

SCALE 1:20

CONCEPT DESIGN



DETAIL 1 SCALE 1:10

- NOTES:-
1. ALL FLANGED PLASTIC PIPEWORK TO BE ABS CLASS 12.
 2. ALL FLANGES TO BE CLASS 14.
 3. ALL CONCRETE TO BE 40MPa STRENGTH.
 4. MINIMUM CONCRETE COVER TO BE 75mm.
 5. LIMIT OF CONTRACT FOR BORE PIPE COLUMN IS AT FLANGED INTERSECTION BETWEEN DN100 FLANGED BORE AND FLANGED BORE COLUMN.



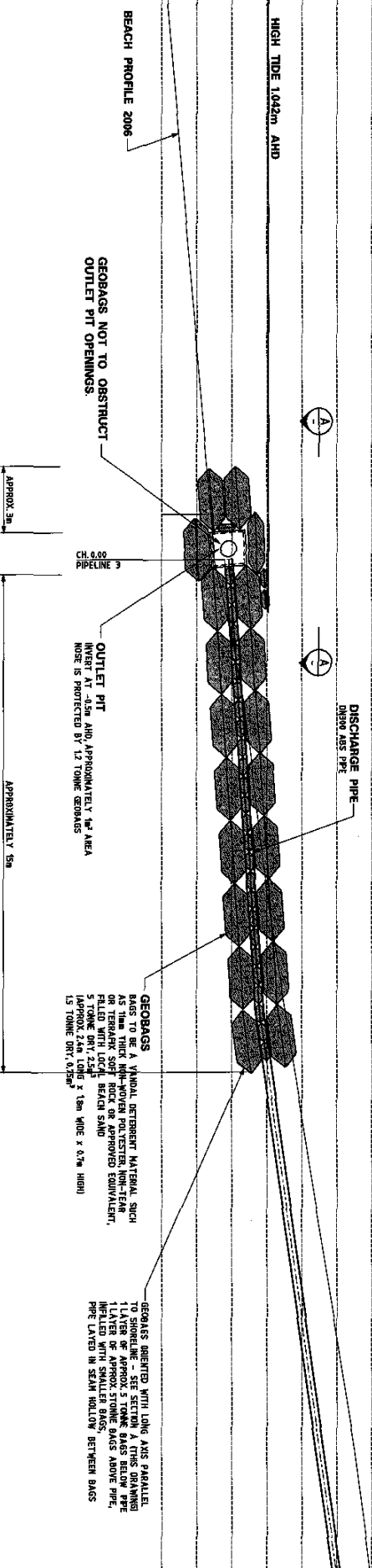
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CLIENT	WYONG CITY COUNCIL
DESIGNER	CONSTRUCTIVE
DATE	25/09/2006

DESIGNER	CONSTRUCTIVE
DATE	25/09/2006



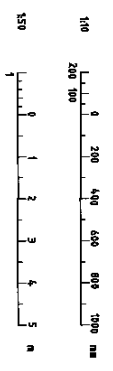
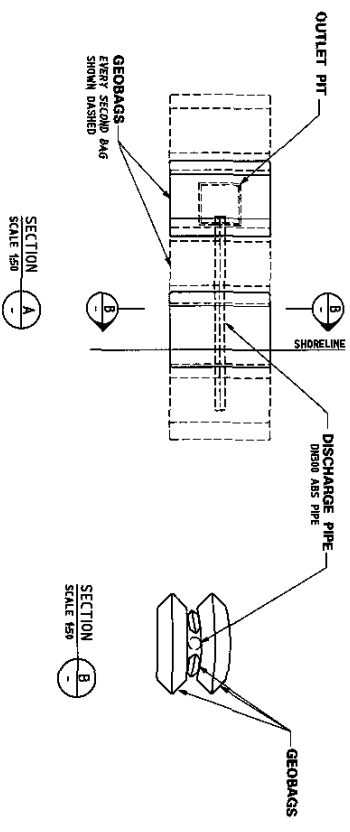
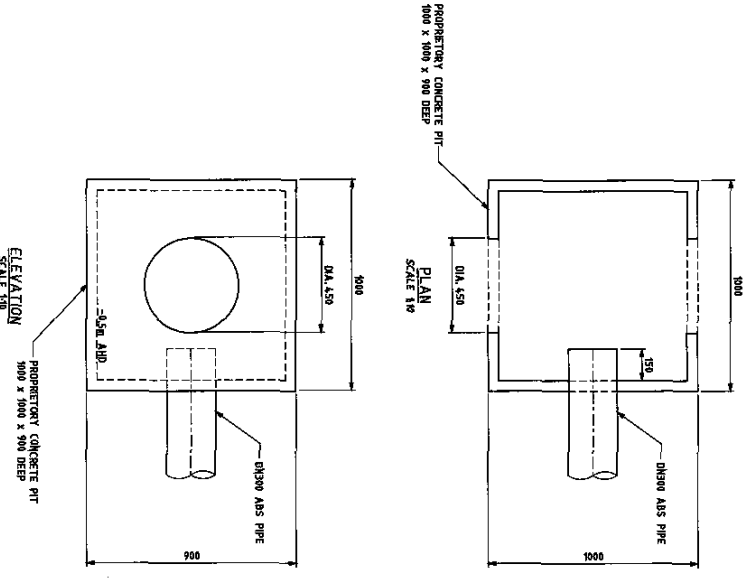
PROJECT NAME	WYONG TEMPORARY DESALINATION UNITS
CLIENT	WYONG CITY COUNCIL
DESIGNER	CONSTRUCTIVE
DATE	25/09/2006

R.L. 5.0m (AHD)
 R.L. 4.0m (AHD)
 R.L. 3.0m (AHD)
 R.L. 2.0m (AHD)
 R.L. 1.0m (AHD)
 R.L. 0.0m (AHD)
 R.L. -1.0m (AHD)
 R.L. -2.0m (AHD)



TYPICAL GEOBAG PROTECTION OF SEAWATER CONCENTRATE RETURN LINE

SCALE 1:50



1. REVISION FOR REVISIONS 2. CHECKED BY: [] 3. DATE: []	CONCEPT DESIGN	PROJECT NO: [] PROJECT NAME: [] PROJECT DATE: []	DRAWING NO: [] DRAWING NAME: [] DRAWING DATE: []	CLIENT: [] PROJECT MANAGER: [] PROJECT ENGINEER: [] PROJECT SUPERVISOR: [] PROJECT ASSISTANT: []	PROJECT NO: [] PROJECT NAME: [] PROJECT DATE: []	PROJECT NO: [] PROJECT NAME: [] PROJECT DATE: []	PROJECT NO: [] PROJECT NAME: [] PROJECT DATE: []	PROJECT NO: [] PROJECT NAME: [] PROJECT DATE: []
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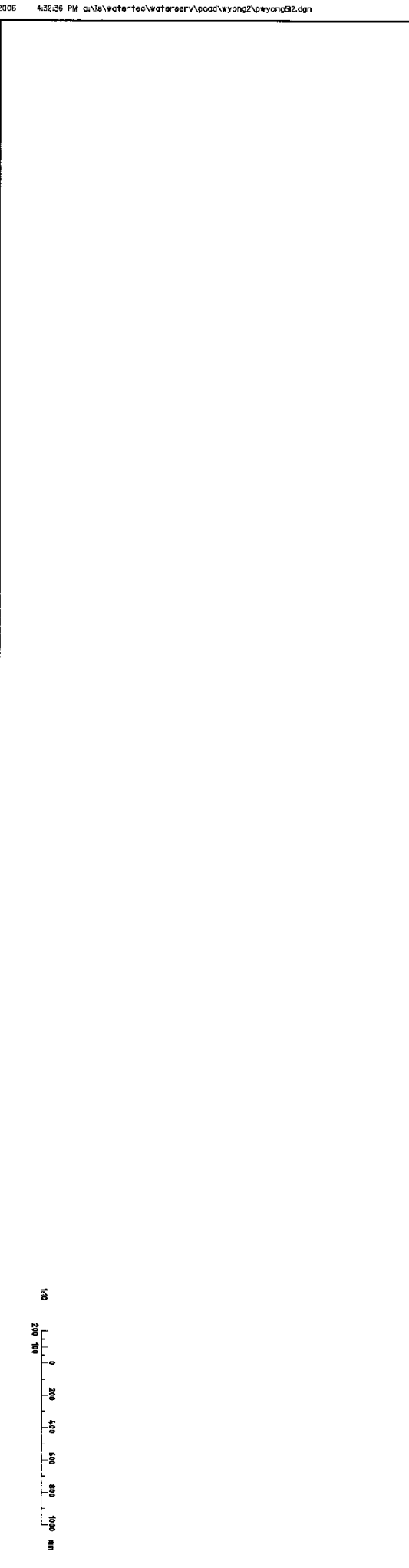
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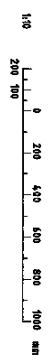
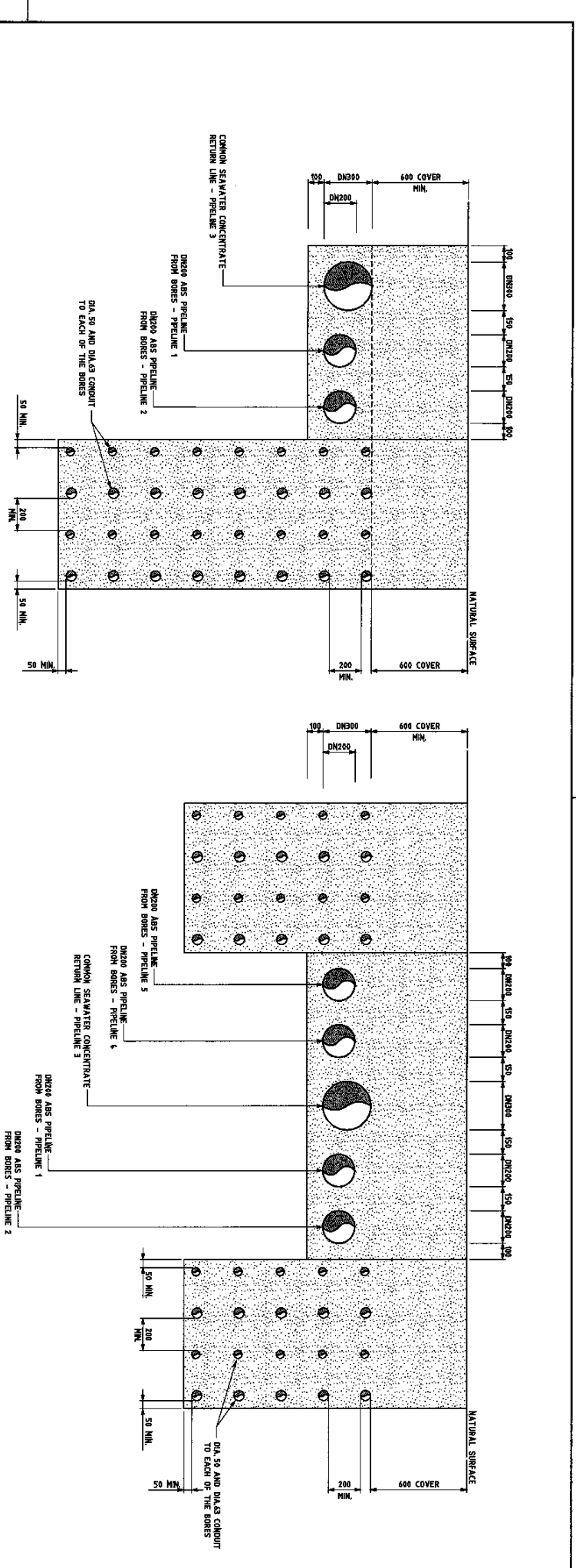
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<p>CONCEPT DESIGN</p>					
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<p>1. DESIGN FOR REVIEW</p> <p>DATE: _____</p>		<p>2. CHECKED BY: _____</p> <p>DATE: _____</p>		<p>3. APPROVED BY: _____</p> <p>DATE: _____</p>	
<p>WYONG TEMPORARY DESALINATION UNITS</p> <p>WYONG-512</p>					



TYPICAL CONDUIT / PIPE BEDDING DETAILS FOR 2 ML/DAY PROPOSALS
SCALE 1:50

TYPICAL CONDUIT / PIPE BEDDING DETAILS FOR 4 ML/DAY PROPOSALS
SCALE 1:50



WYONG TEMPORARY DESALINATION UNITS

WYONG-512

REVISION 0