

**Submission to the Review of Environmental Factors - North Head
Wastewater Treatment Plant – NSOOS Scrubber Replacement
Project by Manly Council and Manly Council Community
Environment Committee**

Background:

Manly Council’s Community Environment Committee has a long history of involvement with odour issues from the North Head Sewage Treatment Plant. In 1990, they raised the alarm about health impacts from the plant’s three incinerators burning 100 tonnes of sewage sludge per day which were denied by the authorities. After a long campaign followed by a long scientific investigation the community’s concerns were acknowledged by decommissioning of the incinerators.

Later, when residents regularly reported odours and dust to authorities, consistent with large uncovered stockpiles of sludge mixed with lime curing out in the open, again their concerns were dismissed. Until one day, Minister Webster unveiled a large shed for the biosolids!

(1994-1995 Manly Daily **“North Head Plan to Beat Odours, Dust”, “Inquiry Into Toxic Lime Dust Leaks”, Northern Beaches Weekender 3rd June 1994 “Sludge to be enclosed”** stated that a sealed building for mixing and storing the sludge would take the place of outdoor sludge stockpiles – Minister Webster stated that he was confident that the new facility would completely solve the dust problem and denied that the government **had been slow in responding to the residents’ complaints.** Local Member, Dr. Peter Macdonald said that **“he was pleased to see the government finally acknowledging a problem that the community has been talking about for several years.**

Seventeen years later in 2011, the Manly Daily Editorial stated

“Bad Smell at North Head” -Of all the local complaints that find their way to the office here at the Daily, the smell coming from North Head is one of the most consistent. Locals are constantly raising the issue and for years there has been no adequate answer”.

Residents welcomed the announcement of the \$82 million Odour Management Project to reduce the impact of odours on the communities of the North Head, Malabar and Cronulla STPs which appeared in a feature article of Engineers Australia Journal in May 2011.

Correspondence between the Managing Director of Sydney Water, local Member Mike Baird and the General Manager of Manly Council confirmed that the consultants from the Odour Management Program Alliance work would commence on the North Head project late last year.

In August 2013, the Ombudsman's released his report into their investigation on the lack of action by the EPA on an odour incident of 24th February 2010 where 20 people attending an evening meeting at the North Head Sanctuary experienced a strong sewage odour. This report detailed the investigation and made 13 recommendations.

The Proposal:

The main reason for the proposal is that the existing NSOOS scrubber is "nearing the end of its useful life" so that the objectives of the proposal are to replace the existing NSOOS Scrubber and to take the opportunity to increase the air flow within the NSOOS from Clontarf to the WWTP. It is claimed this will improve reliability of the scrubber and reduce corrosion in the main sewer as well as improving underground ventilation of the plant.

This proposal is predicted to ***"slightly improve odour impacts on the surrounding community"***, whereas the Malabar WWTP REF proposal objective is ***"to reduce the risk of odour impacting the local community and to comply with the DECCW requirements of 'no nuisance' odour emissions."***

Although the North Head REF has been designed by the Odour Management Program Alliance, the organisation which was responsible for the development of the REFs for Malabar and Cronulla, the North Head REF does not focus on the odour reduction of the plant, instead it focuses on the NSOOS Scrubber reliability, corrosion issues, and on underground ventilation by increasing the air flow through the proposed NSOOS scrubber from 29 m³/s to 35m³/s. The reduction in the scope of the North Head REF illustrated by its length of only 73 pages as against the 190 pages in the REF for Malabar.

There is no discussion about odour impacts outside the boundary of the plant and the proposed Farmhouse Primary School were not taken into consideration. The school will be in a zone between 3 ou and 4 ou contours, and the hospital in a zone higher than 2 ou, whereas the DECCW Odour Assessment Criteria in the Technical Framework, given in Table 1, clearly indicates that schools and hospitals should in areas with less than 2 ou. See Map 1 - Adapted from the Odour Modelling for North Head REF replacement of NSOOS Odour Scrubber 2013 to show sensitive receptors.

Table 1: EPA odour assessment criteria

Population of affected community	Odour assessment criteria ³ (OU)
Rural single residence (≤ 2)	7.0
~ 10	6.0
~ 30	5.0
~ 125	4.0
~ 500	3.0
Urban area (≥ 2000) and/or schools and hospitals	2.0

On page 22, “When compared with the alternatives this option not only performed best against the principles of ESD, but also has minimal social, environmental and financial costs”.

There is no mention of the other alternatives that may have been taken into consideration when deciding which alternative would be the most applicable, besides the alternative of **doing nothing**, neither is there any mention of how the “social and environmental costs” were evaluated.

On page 21 the following appears:

“A number of technologies were evaluated to meet the design performance requirements of this Proposal, in particular an outlet odour concentration of less than 1,000 odour units [sic] during normal operation.”

There is no mention on how and why the odour concentration of **1,000 ou/m³** was chosen. With the main focus of the proposal to increase the air flow into the NSOOS Scrubber from 29 m³/s to 35 m³/s, which together with an odour concentration of 1,000 ou/m³ would lead to an emission rate into the atmosphere of **35,000 ou/s**. This emission rate is approximately **60% higher than the odour concentration which existed in 2004¹** from the same scrubber.

The REF indicates that the current scrubber is operating with an odour concentration of **1,900 ou/m³**, and an odour emission rate into the atmosphere of **55, 290 ou/s**. **As may be seen in Figure 1, this is three times larger than the emission rate of odour in 2004¹, which was 18, 270 ou/s.**

That the NSOOS scrubber is “approaching the end of its useful life” is mentioned throughout the REF, but there is no mention of what determines the threshold of the end of its useful life. Is a concentration of 1,900 ou/m³, around three times its value of 630 ou/m³ in 2004, not yet past its useful life? Will the odour concentration and exhaust of the new scrubber increase as quickly and significantly as has happened with the present NSOOS scrubber in the past nine years?

Is 1,000 ou/m³ an acceptable odour concentration to start with? Why not 500 ou/m³; as was selected in the Decision Report for Malabar? In the Malabar WWTP Decisions Report it is stated that in order to reduce the impact of odours on the community, the odour concentration at the exhaust from the scrubber would be reduced from 1,000 to 500 ou/m³. It is interesting to note that the brief to MWH mentioned on page 8 of the attached in 2004 North Head Odour Review required to use a “Target odour performance for odour scrubber discharge to atmosphere is defined in the Brief as 500 OU [sic].” It appears that the brief for the present REF for North Head was based on 1000 ou/m³ for release into the atmosphere. Why has there been a reduction in standards of odour emission in the intervening decade?

If the emission rate of the proposed NSOOS scrubber were to be reduced to the standard adopted for the Malabar WWTP, viz. 500 ou/m³, then as may be seen in Figure 2, there would be a 4% reduction from the 2004 total emission figures for this scrubber. The halving of the proposed emission rate from 35,000 ou/s to 17,500 ou/s would reduce the odour footprint shown on page 45 of the REF. The total emissions from the plant would be from 83,500 ou/s, rather than the proposed 101,000 as shown in the REF. This would mean a reduction of 31% in the present total emissions from the plant instead of merely 16.5% as proposed in the REF. See Map 2 - Malabar Proposed Final Odour Contours Superimposed on North Head Proposed Final Odour Contours for comparison.

In Table 2 below taken from the 2004 MWH report, the total emissions from North Head were 178,000ou/s. Since the odorous activities performed in the Theiss building no longer exist, the emissions from North Head without the contribution from Theiss building would have been 76,000 ou/s. As demonstrated above, even with the new scrubber operating at 500 ou/m³, the odour emissions generated at North Head would be 87,500, which is 15% higher than would have been the case with the Thiess building not operating in 2004.

It is also interesting to note that the proposal by MWH in response to the brief from Sydney Water would have resulted in 51,000 ou/s, nearly half of the proposed 101,000 in the present REF.

It follows therefore that to use the 55,000 ou/s being put out by the present NSOOS scrubber is not in any way a tenable baseline for indicating an improved performance. The 76,000 ou/s being the total output from the site in 2004 without the contribution from the Thiess building should be the baseline for comparison so as to be consistent with the requirements of the Environmental Protection Licence EPL 378 for continuous improvement (see page 16)

As far as North Head NSOOS Scrubber is concerned, as is clearly shown in Figure 1 below, there will have been no improvement in the scrubber performance since 2004 if the proposed scrubber were to be installed. In fact, there will be a doubling of odour output, ie a drastic reduction in standards, as may be readily seen by comparing the proposed BTf with the 2004 NSOOS Scrubber in Figure 1.

¹ MWH report for Sydney Water “North Head STP PAR Project – Concept design – Odour Review” 7 December 2004.

We were told during the drop in session at Manly Community Centre that the current air flow from the NSOOS is about $8\text{m}^3/\text{s}$. The REF proposal indicates that the air flow from the NSOOS will be increased to $15\text{m}^3/\text{s}$, which would mean an increase of only $7\text{m}^3/\text{s}$. Will this reduce corrosion sufficiently and how was this determined? Why is the large flow rate of $20\text{m}^3/\text{s}$ required from the under floor area of the grit chamber?

The current scrubber Sodium Hypochlorite consumption is around 25 kL/week, but the new BTF reactors will produce up to “*129 kL/day of leachate ... consisting of a dilute sulphuric acid solution which would be returned to the head of the works for treatment.*” Because there is no treatment for neutralizing acids at the North Head WWTP, does treatment mean “dilution”? The amount of dilute sulphuric acid is **equivalent to 47 ML/year**. That is 47 Olympic swimming pools of dilute sulphuric acid will be dumped into the ocean. Because there was no concentration giving, a real indicator of what is being sent to the Ocean cannot be evaluated.

Because of the increasing concentration of CO_2 in the atmosphere and the consequent acidification of the ocean is it responsible policy to dump extra acidity into the coastal water? What will be the effect of the additional extra dilute sulphuric acid? Did Sydney Water make the EPA aware of the possible huge impact in the dumping of acid into ocean as proposed in the REF?

Table 2: North Head Odour Emissions – Current Operations Design Airflows

ODOUR SOURCE	Odour Concentration OU/ m^3	SOER OU. $(\text{m}^2.\text{s})^{-1}$	Area m^2	Air Flow $\text{m}^3.\text{s}^{-1}$	Emission Rate OU. s^{-1}
NSOOS Scrubber	630			29	18270
Process Scrubber	800			12	9600
Dewatering Scrubber	1920			5	9600
Thiess Building Scrubber	3270			30	98100
Thiess Process Scrubber	8060			0.5	4030
Primary Sedimentation Tanks inlet	5590	2.2	625		1349
Primary Sedimentation Tanks middle	5080	2.0	625		1226
Primary Sedimentation Tanks outlet	6800	2.6	625		1641
Admin Building Vent	510			8	4080
M1 Screenings Area	630			48	30240
TOTAL					178135

40% of the odour emissions relate to the primary sedimentation tanks, co-generation plant exhaust, waste gas flare and decline tunnel. Based on the Voluntary Audit Report of the NHWWTP 2012 these do not appear to have been reduced.

RECOGNITION OF HERITAGE AND TOURISM **SIGNIFICANCE**

The NHWWTP is sited in the middle of Sydney Harbour National Park and adjoining the North Head Sanctuary run by the Harbourtrust. Sydney Water recognizes this by the WWTP being part of the new directional signage for the North Head Sanctuary on North Head Scenic Drive.

An extract of the Australian Heritage Database Statement of Significance is attached, Attachment 1.

Briefly it states that:

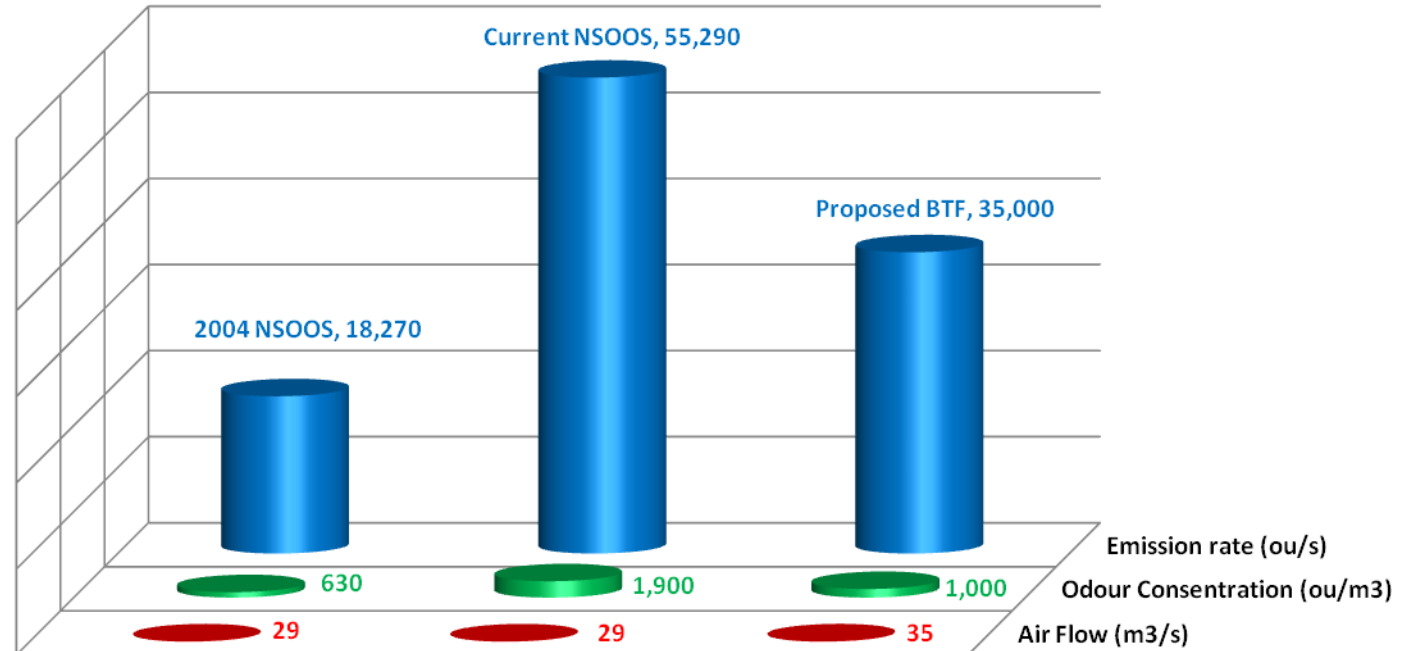
“North Head is an area of great cultural richness, diversity and natural interest.” It has been described together with Dobroyd Head as “the most precious parts of Sydney Harbour National Park” which “contain the most extensive heath and scrub vegetation around Sydney Harbour, much of it in almost undisturbed condition.”

North Head is a highly significant part of the National Landscapes high profile tourism program involving stakeholders from the commonwealth and state governments. Because of its geographical position it plays a key role in the Sydney Harbour Scenic Walk and the Coastal Walk to Palm Beach.

In other words, the plant is not in the middle of agricultural or waste land and these issues must be considered in the day to day running of the plant.

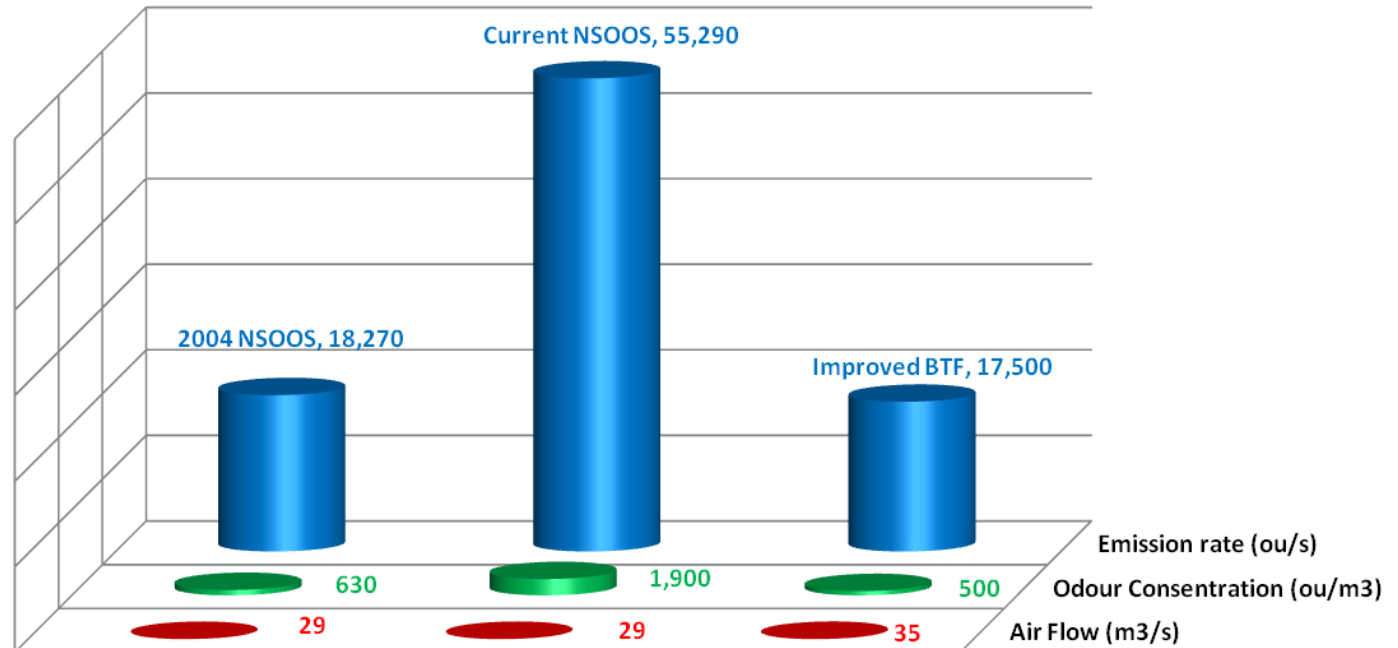
These issues should be matters for consideration in the REF.

Figure 1 - Air extraction of proposed scrubber with an odour concentration of 1000 ou/m³ compared to the 2004 scrubber and the current scrubber



	2004 NSOOS	Current NSOOS	Proposed BTF
■ Air Flow (m3/s)	29	29	35
■ Odour Concentration (ou/m3)	630	1,900	1,000
■ Emission rate (ou/s)	18,270	55,290	35,000

Figure 2 - Air extraction if the proposed scrubber had an emission rate of 500 ou/m³ compared to the 2004 scrubber and the current scrubber



	2004 NSOOS	Current NSOOS	Improved BTF
■ Air Flow (m ³ /s)	29	29	35
■ Odour Concentration (ou/m ³)	630	1,900	500
■ Emission rate (ou/s)	18,270	55,290	17,500

Map 1 - Adapted from the Odour Modeling for North Head REF Replacement of NSOOS Odour Scrubber 2013 to Show Sensitive Receptors



Definition of odour units (OU): When half of the population can detect an odour, it is equal to 1 OU (Sydney Water, presentation on 11 September 2013).

Greater than 2 OU exceeds the EPA Guidelines for hospitals, schools, and urban areas with a population \geq 2000 people (REF 2013, and Approved Methods for Modelling and Assessment of Air Pollutants in NSW, August 2005, EPA). Most people could smell 2 OU.

Map 2 – Malabar proposed Final Odour Contours Superimposed on North Head Proposed Final Odour Contours



Attachment 1 - Extracted From Australian Heritage Database

North Head, North Head Scenic Dr, Manly, NSW, Australia

Photographs	None
List	Register of the National Estate (Non-statutory archive)
Class	Natural
Legal Status	Registered (24/09/2002)
Place ID	101621
Place File No	1/13/024/0019

Statement of Significance

North Head is an area of great cultural richness, diversity and natural interest.

North Head has been described (together with Dobroyd Head) as "the most precious parts of Sydney Harbour National Park" which "contains the most extensive heath and scrub vegetation around Sydney Harbour, much of it in almost undisturbed condition".

North Head is a refuge for remnant populations and artificially disjunct species that have been displaced from most of the immediate area of Sydney by urbanisation. A range of vulnerable and endangered plants occurs. Significant species are the sunshine wattle (*ACACIA TERMINALS* SSP *TERMINALIS*), endangered at both state and Commonwealth level and the stringy bark (*EUCALYPTUS CAMFIELDII*) listed as vulnerable at state and Commonwealth level. A number of other species are regarded as locally rare including the ground orchid (*ERYTHORCHIS CASSYTHOIDES*), the wet heath ground cover (*RULINGIA HERMANIIFOLIA*) and the nodding raspwort (*GONOCARPUS SALSOLOIDES*).

Several significant populations of rare species occur at North Head. The breeding populations of the long-nosed bandicoot (*PERAMELES NASUTA*) and the little penguin (*EUDYPTULA MINOR*) are listed as endangered populations under state legislation. The little penguin colony is one of the last surviving breeding populations on the mainland of New South Wales. The bandicoot population of several hundred individuals is isolated from other

remnant populations in the Sydney Basin and is threatened by motor vehicles, domestic pets and further development of the area. The red-crowned froglet (*PSEUDOPHRYNE AUSTRALIS*), a species largely endemic to Hawkesbury Sandstone, is listed as vulnerable at state level, the major threats being pollution and urbanisation. The nomadic superb fruit-dove (*PTILINOPUS SUPERBUS*), listed as vulnerable at state level, has been recorded from the area of North Head, a significant observation of the species close to the limit of its current distribution range.

North Head is also visited by a number of migratory birds listed under the JAMBA and CAMBA migratory bird agreements, including the common tern (*ATERNA HIRUNDO*), arctic jaeger (*STEROTRARIUS PARASITICUS*), spine tailed swift (*HIRUNDAPUS CAUDACUTUS*) and wedgetailed shearwater (*PUFFINUS PACIFICUS*).

Spring Cove is the type locality for the Brown Antechinus (*ANTECHINUS STUARTII*), though it remains unclear whether the species is locally extinct or not.