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Secretary
NSW Department of Planning and Environment
Level 22, 320 Pitt Street,
Sydney NSW 2000

Email: carolyn.mcnally@planning.nsw.gov.au

Dear Ms McNally,

Re: Formal complaint – Windsor Bridge Project – MBO and other matters.

As you know, the Windsor Bridge Replacement Project is a public infrastructure project that, over the past decade, has been the cause of escalating community concern.

One area of recent and significant unease relates to the reported presence, at the construction site, of acid sulfate soils (ASS). Matters of particular concern include:

- Hawkesbury LEP maps showing ASS to be located on the northern bank and some areas of the southern bank of the Hawkesbury River at Windsor;
- On 29 and 30 October 2018, Observers at the Windsor Bridge Replacement Project (WBRP) construction site first witnessed a black "sludge" being excavated from the river bank area;
- RMS personnel verbally confirmed this material was Monosulfidic Black Ooze (MBO);
- Further extraction from the river, of material resembling MBO, has continued to occur;
- There is an extraordinary degree of ground and riverbed disturbance, given the documented potential for acid sulfate materials (ASM);
- When excavated, material is generally relocated to the designated ASS treatment area, although community "Observers" are not aware of any treatment of this material occurring;
- Observers report and have photographs of drilling machinery emerging wet from land-based drill sites;
- Concrete has been poured down these holes regardless of these conditions;
- Most recently it appears "contaminated" soil is being removed from the construction site to unlicensed facilities, in contravention of the project's Construction Acid Sulfate Materials Management Plan (CASMMP);

- There is visible, ongoing soil instability on the north bank.

As a matter urgency, due to the seriousness of these issues, it is requested the following information, including a plain English explanation and consistent with the *Acid Sulfate Soil Manual* be made publicly available and easily accessible:

- Results of testing surface, ground and leachate water associated with any disturbance of acid sulfate soils for parameters including pH, EC or total dissolved solids;
- Results of ongoing assessment of the status of any oxidation occurring within the soils stockpiled on site.

As well as the following information:

- Background levels (baseline prior to construction) of dissolved metals, pH, EC etc for river water, both upstream and downstream of the site;
- The results of all monitoring of these levels, including upstream and downstream, since the commencement of construction;
- The results of all monitoring of runoff water quality from the site;
- All incident reports associated with the occurrence of ASM or MBO, or exposures of these materials by instability;
- All treatment records and, post treatment, all field and laboratory test results;
- The performance criteria used to confirm the effective neutralisation of soils, post treatment;
- Actions taken in the event neutralisation was not effective;
- Contingency plans for management of stockpiles of ASM in the event of flooding of the treatment area;
- The final destination of neutralised soil, as tracked and recorded using a Treated ASS Tracking Register, including details of excavation location, date and volume, treatment location, date, Suspension Peroxide Oxidation Combined Acidity and Sulfur (SPOCAS) verification results post treatment and reinstatement location; and
- Specific details regarding how batches of soil are identified and tracked.

At the Hawkesbury City Council meeting of 27.11.18, Councillor Danielle Wheeler asked whether soils at the Windsor Bridge Project had been tested for Per- and poly-fluoroalkyl substances (PFAS). The answer provided 11.12.18 was “The Director City Planning advised that this is under investigation and Councillors will be advised of the outcome in due course.”

Answers to the following questions must also be made publicly available:

- Have soils at the Windsor Bridge project site (on both sides of the river) been tested for PFAS?
- If not, why not?
- If they have been tested what are the results?

Additionally, on February 18 this year we alerted your staff to our attempts to obtain, from the RMS, two project documents referenced in other WBRP reports:

1. *Arboricultural Development Assessment Report,* 2013, as cited in the final Urban Design and Landscape Plan, and,

2. *The Geotechnical Factual Report - Windsor Bridge Replacement Detailed Design*.

To date, whilst the request has been acknowledged, we are yet to be advised as to where these two documents may be viewed and why we have been unable to find them on the RMS website, with the other project documents. We have also, as mentioned in the attached briefing, been unable to find the Acid Sulfate Management Plan, which we believe, should have formed part of the EIS.

We are also extremely concerned by the apparent politicisation of the project with workers claiming they will be paid bonuses for achieving unspecified milestones prior to the State election, 23.3.19.

Please see further detail regarding concerns requiring action by relevant government agencies, as provided in the attached briefing paper.

Given the potential seriousness of the situation at the construction site, I anticipate your most urgent response to the matters raised in both this correspondence and the attached briefing. I and other senior members of CAWB remain willing to meet with you to discuss any aspect of this project, or the complaints contained herein.

Yours sincerely,

Harry Terry
President, CAWB
15 March 2019
Reissued: 17.3.19

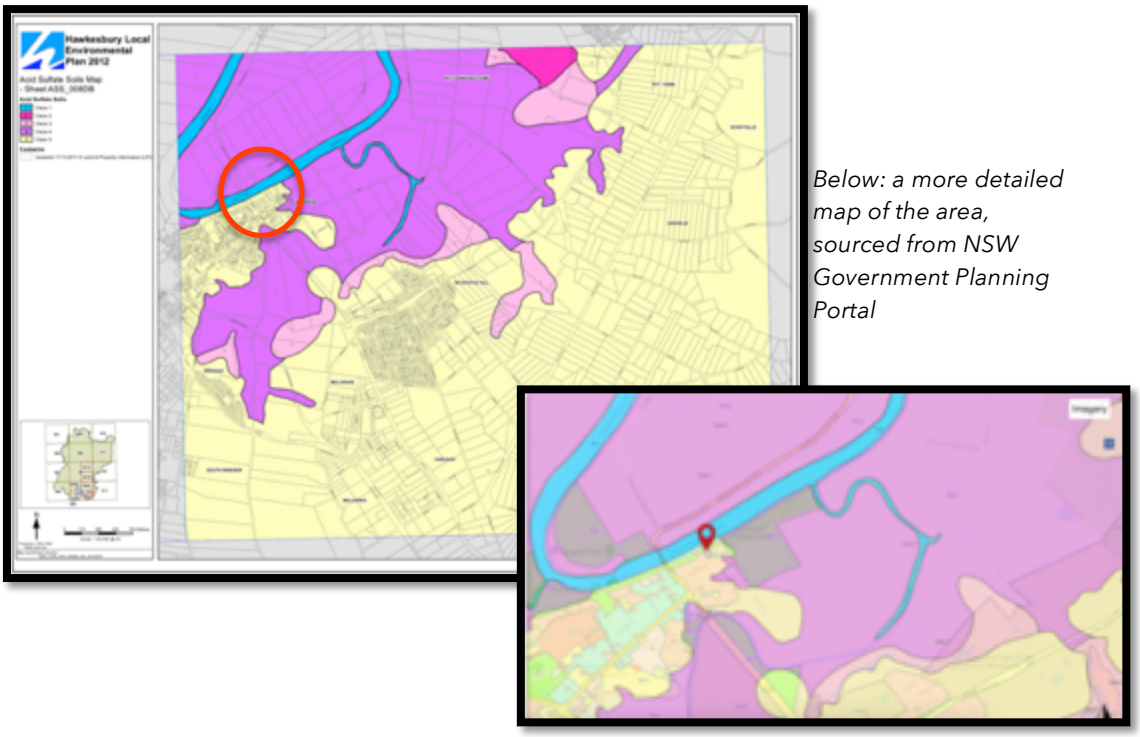
Cc:
Mark Gifford, Acting Chair and CEO, Environmental Protection Authority
Scott Hansen, Director General, NSW Department of Primary Industries (Fisheries)
Martin Hoffman, Secretary, Department of Finance, Service and Innovation (SafeWork)
Frank Howarth PSM, Chair Heritage Council of NSW
Ken Kanofski, Chief Executive, Roads and Maritime Services
Natalie Vella, Senior Solicitor, EDO

COMMUNITY ACTION FOR WINDSOR BRIDGE
FORMAL COMPLAINT
WINDSOR BRIDGE PROJECT:
ACID SULPHATE SOILS & MONOSULFIDIC BLACK OOZE
AND OTHER MATTERS

CONTENTS

CONTEXT

The Windsor Reach section of the Hawkesbury River, according to the relevant LEP map, (008DB), comprises ASS for the entire extent of the north bank and a significant portion of the south bank, excluding part of Thompson Square. This "Reach" is where the highly contested Windsor Bridge project is currently underway.



Below: a more detailed map of the area, sourced from NSW Government Planning Portal

Due to the current RMS project to build a replacement bridge at Thompson Square, Windsor, these soils are undergoing massive and potentially dangerous disruption. See photographs in separate file, (Tab A).

Notes

- *Questions arising from the concerns identified within this paper are in red text.*
- *Whilst the spelling of "sulfate" is equally acceptable as "sulphate"; for consistency, regardless of source spelling, the form "sulfate" is used within this document.*

SPECIFIC CONCERNS

September 2011, State Significant Infrastructure Application Report

In 2011, the RTA prepared an application report for the Windsor Bridge project "in support of a State significant infrastructure application under section 115X of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act)."

The application report was to assist with the "formulation of environmental assessment requirements by the Director-General under section 115Y of the EP&A Act." In particular, the application report says it identifies key environmental issues for the project.

The application report and Director-General environmental assessment requirements informed the preparation of the environmental impact statement (EIS) for the project.

The application report identifies five key environmental issues (Non-Aboriginal heritage, Aboriginal heritage, Noise and vibration, Land use, property and socio-economic and Urban design (including landscape character and visual impact)) as requiring further detailed assessment, possibly requiring project specific impact mitigation measures.

Chapter 5 deals with the "other environmental issues" which were 'to be assessed further in any future environmental impact statement for the project." and notes "there is potential for acid sulfate soils (ASS) to occur within Windsor and its surrounds. The project would be within class 4 and 5 on the Hawkesbury City Council's ASS vulnerability map."

More specifically the report says *"the project has the potential to impact on soil and water as follows...*

- *Potential exposure of acid sulfate soils to the air as a result of excavation and construction works, resulting in the potential for sulfuric acid to impact groundwater, soils and waterways in addition to the built environment."*

Whilst it has not been possible through online searching to identify the "Hawkesbury City Council's ASS vulnerability map" referred to in the report, it is clear from the map (below) sourced from the Hawkesbury Residential Land Strategy 2010, the identification of the class and distribution of acid sulfate soils in the area at the time the report was written was consistent with current maps (see page 5).

Proposed further assessment was to include the "Identification of any actual or potential acid sulfate soils and an appropriate management approach, if required."

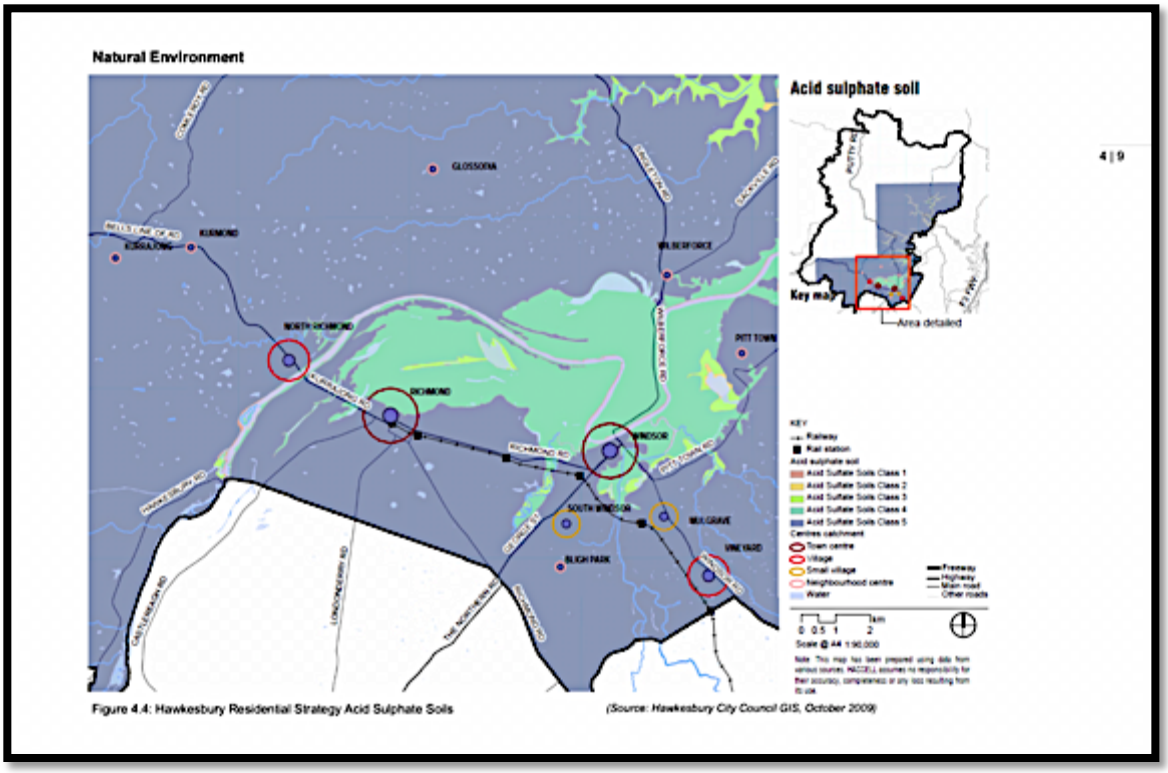
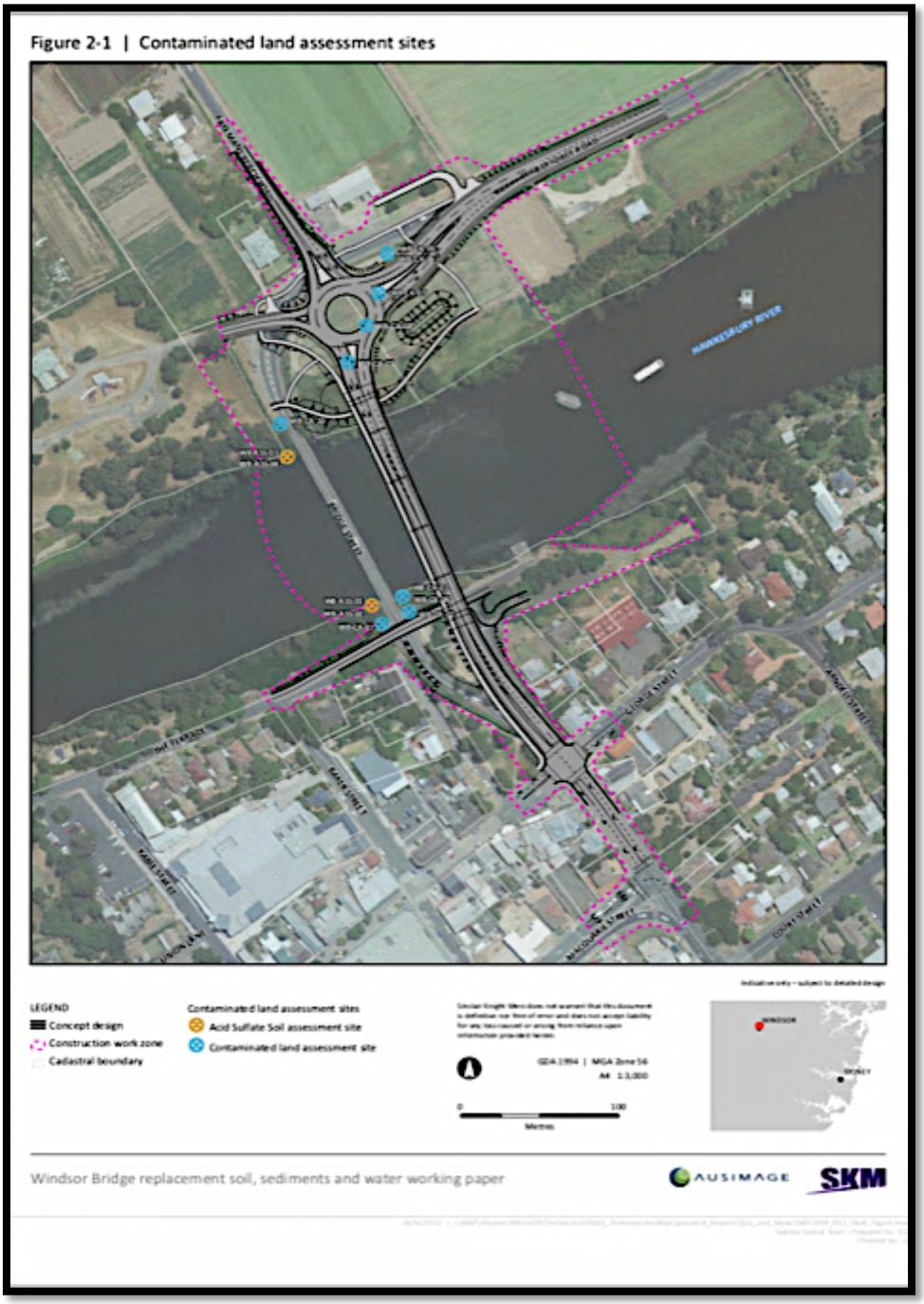


Figure 4.4: Hawkesbury Residential Strategy Acid Sulphate Soils (Source: Hawkesbury City Council GIS, October 2009)

http://www.hawkesbury.nsw.gov.au/__data/assets/pdf_file/0004/27382/4_KeyIssues.pdf

2012 EIS: Pre-project testing for Acid Sulfate Material (ASM)

The plan below (from WBRP EIS page 20, Windsor Bridge Replacement Soil, sediments, water and waste working paper) shows four acid sulfate assessment sites (orange dots): two co-located on the north bank and two co-located on the south bank. All four are upstream of the existing historic Windsor Bridge, away from the proposed project site.



The EIS for the Windsor Bridge Project (page 328, https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-EIS-chapter-7-6.pdf) also says:

"Acid sulfate soils
Acid sulfate soils (ASS) risk maps from the NSW Natural Resource Atlas database were reviewed to ascertain the presence of ASS within the project area. Sampling and analysis (using Suspension Peroxide Oxidation Combined Acidity and Sulfur analytical method) of river bed sediments was undertaken to determine the presence of acid sulfate soils and any requirements for

management based upon the Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).”

At page 332 of the same document:

“Acid sulfate soils
Sampling of riverbed sediments indicated that there are potentially low strength acid sulfate soils present within sediments near the southern bank. However as noted in the Acid Sulfate Soils Assessment Guidelines (ASSMAC 1998), estuarine sediments may give false positives to the presence of acid sulfate soil especially if there is a high proportion of organic matter in the sediments.”

The statement “there are potentially low strength acid sulfate soils present within sediments near the southern bank.” is repeated elsewhere in project documentation. Despite the evidence in both the LEP and earlier map, no equivalent reference to Class 4 soil conditions on the north bank has been identified to date.

The four drill sites appear to be the extent of testing for ASM during the EIS phase of the project.

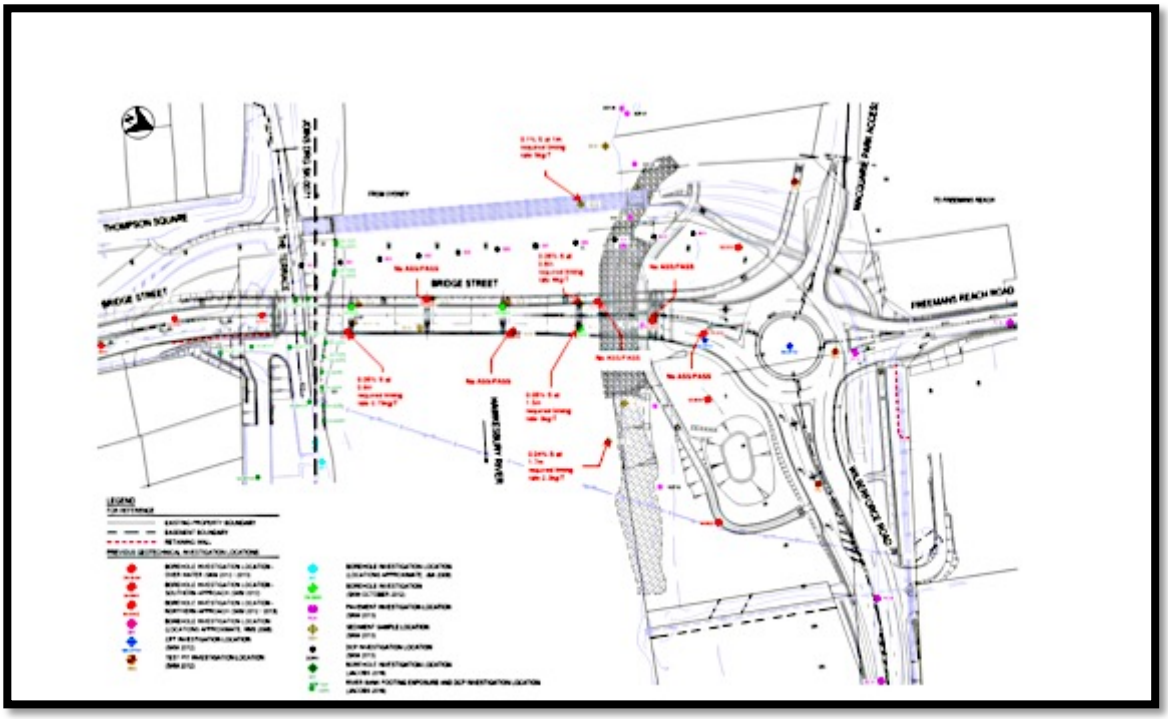
To some extent, this information, provided in the EIS, must have informed the following requirement under Construction Environmental Management Plan (CEMP) in the Instrument of Approval:

> *D5 (d) (iv) “a contingency plan, consistent with the Acid Sulfate Soils (sic) Manual, to deal with the unexpected discovery of actual or potential acid sulfate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage;”*

The construction phase thus saw the preparation of the project’s Construction Acid Sulfate Materials Management Plan (CASMMP), which mentions a fifth test site as follows:

“The Geotechnical Factual Report - Windsor Bridge Replacement Detailed Design (Jacobs 2017) showed 5 boreholes within the alluvial sediment that recorded the net acidity and the Chromium reducible sulfur levels greater than the action criteria (>0.03). See Appendix C for the results of the chromium suite analysis from alluvial sediment within the project area. The highest S% from all the test results is 0.1% which is a very low level acid sulfate soil and would require a liming rate of 5kg/T.”

The CASMMP also includes the following map which indicates ten sites ranging from no ASS /PASS, to requiring a 5kg/T liming rate.



Finally, Appendix C of the CASMMP provides an extract from the Geotechnical Factual report (Jacobs 2017), which summarises the results of testing.

Confusingly, the Jacobs table refers to eighteen test sites:

Location ID	Sample Depth (m)	pH_{KCL}	S_{CR}/S_{POS} (%S)	S_{TAA} (%S)	S_{NAS} (%S)	S_{ANC} (%S)	Net Acidity (%s)	Action Criteria
NA-BH01	7.00	4.8	<0.005	0.02	<0.005	<0.05	0.02	-
NA-BH01	9.50	5.2	<0.005	<0.01	-	<0.01	<0.01	-
NA-BH01	15.00	5.2	0.01	<0.01	<0.005	<0.05	0.02	-
NA-BH02	6.80	6.5	<0.005	0.02	-	<0.01	0.03	-
OW-BH01	0.60	8.1	0.05	<0.01	-	1.2	<0.01	> 0.03 (exceeds action criteria)
OW-BH02	1.20	6.6	<0.005	<0.01	-	0.12	<0.01	-
OW-BH03	7.00	5.9	<0.005	<0.01	-	<0.05	<0.01	-
OW-BH04	3.00	5.5	0.01	0.02	-	<0.05	0.01	-
SS01	0.40							
SS02	0.20	4.9	0.02	0.01	-	<0.05	0.03	-
SS03	0.20	5.7	<0.005	<0.01	-	<0.05	<0.01	-
SS04	1.80	5.7	<0.005	<0.01	-	<0.05	<0.01	-
SS05	0.60	5.2	<0.005	<0.01	-	<0.05	<0.01	-
SS08	1.00	5.6	0.1	0.01	-	<0.05	0.11	> 0.03 (exceeds action criteria)
SS09	0.80	5.3	0.08	<0.01	-	<0.05	0.09	> 0.03 (exceeds action criteria)
SS10	1.50	4.8	0.05	0.02	-	<0.05	0.07	> 0.03 (exceeds action criteria)
SS11	0.30	4.8	0.02	0.01	-	<0.05	0.03	-
SS12	1.70 – 1.80	4.6	0.04	<0.01	-	<0.05	0.05	> 0.03 (exceeds action criteria)

1. Are the *Acid sulfate soils (ASS) risk maps from the NSW Natural Resource Atlas database* considered the preeminent resource regarding the location of acid sulfate soils in NSW?

2. Given LEP acid sulfate soil maps are a legislated resource, regardless of any commonality of information, why was the Atlas cited as having been "reviewed to ascertain the presence of ASS within the project area"?
3. Is the number and location of drill sites testing for ASM in the Windsor Bridge project zone consistent with the level of investigation for other RMS projects in identified AS areas?
4. Please cite examples.
5. CAWB again requests the "Geotechnical Factual Report" be made publicly available, if not already in the public domain.

Land-based construction

Given the potential seriousness of the situation and the amount and depth of land-based disruption, CAWB is particularly troubled AS testing has apparently only occurred within the river itself.

The Windsor Bridge EIS at
https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-EIS-chapter-7-6.pdf
says the following about land-based construction:

The risks from land-based construction would largely be during rainfall and wind events, when sediments or pollutants resulting from construction can flow or be blown to sensitive receiving environments. The highest risk to soil, sediment and water quality would occur during construction activities such as:

- *Earthworks, including stripping of vegetation and topsoil, excavation or filling.*
- *Stockpiling of topsoil, vegetation and other construction materials.*
- *Transportation of cut or fill materials.*
- *Movement of heavy vehicles across exposed earth.*
- *Removal of riparian vegetation.*
- *Construction in any areas of highly erodible soils.*
- *Construction in any contaminated land.*
- *Construction in any acid sulfate soils.*

6. What land-based assessment of AS conditions occurred as part of the EIS?
7. Given rainfall conditions experienced since construction started, please detail all mitigation measures implemented; testing undertaken and results; whether it was necessary to implement any contingency plans;

the nature of the response, outcomes and how those outcomes were evaluated.

8. What ongoing actions may be required as a result of the rain conditions and what are the short, medium and longer-term consequences for the river and the geographic extent of those consequences.

Planning Issues

It is a matter of concern that despite government LEP maps zoning the Windsor Bridge location as predominantly acid sulfate soils, the matter appears not to have been a major consideration in the decision to locate the project where it is.

It is also noted AS conditions are implicated in red spot disease in fish; and the presence of blue-green algae, both of which occur in the upper reaches of the Hawkesbury River, hinting at an existing, possibly ongoing issue, which should not be exacerbated, thereby highlighting the imperative, in the first instance, to find a more appropriate location for the project.

It is interesting to note, the EIS (Land Resource Assessment, page 25), for a recently proposed sand mine a short distance upstream from the Bridge site, reported on soil testing at **forty** locations as opposed to the eighteen referenced in the CASMMP.

Furthermore, it is worrying the RMS may have selected the project site without factoring in associated environmental costs (for example the requirement to treat ASM with lime, created by exposing AS soils, reportedly causes the release of carbon dioxide into the atmosphere), rather than identifying a less problematic site.

9. In the case of the Windsor Bridge project, please identify work done by the RMS to specifically identify alternative project options that would not impact on, or disturb, acid sulfate soils.
10. CAWB also seeks advice as to whether the new bridge specifications took AS conditions into account, or whether there have already been, or will be, contract variations arising from the presence of ASM.

Consequences of disturbing acid sulfate soils

The Acid Sulfate Soil Manual referred to in the Instrument of Approval sets out the nature of, and some of the problems associated with ASM, as follows:

> *"Acid sulfate soils is the common name given to naturally occurring soil and sediment containing iron sulfides. When these natural occurring sulfides are disturbed and exposed to air, oxidation occurs and sulfuric acid is ultimately produced. For every tonne of sulfidic material that completely oxidises, 1.6 tonnes of pure sulfuric acid is produced. This sulfuric acid can drain into waterways and cause severe short and long term socio-economic and environmental impacts."*

The Manual goes on to say:

"The impacts of acid sulfate disturbance constitute the most acute water based environmental problem in the coastal areas of NSW. The problem is comparable to the environmental impacts of salinity in inland waters. The environmental impacts of acid drainage can include fish kills, fish disease, oyster damage and mortality, adverse effects on aquatic ecosystems, release of heavy metals from contaminated sediments, human and animal health impacts from polluted water, adverse impacts on soil structure and arability and damage to built structures such as bridges. It is now recognised that the environmental effects of the disturbance of acid sulfate soils can last hundreds or thousands of years.

Acid sulfate soils have economic impacts on most industries on the NSW coastal zone, including tourism, recreational fishing, commercial fishing, oyster and other aquaculture industries, sugar cane, tea tree, grazing and dairy, extractive industries as well as urban development industries. The costs associated with the damage to public and private infrastructure is also significant (eg corrosion of drinking water pipes, bridge footings and floodgates)." (Emphasis added)

Monosulfidic Black Ooze

The RMS verbally confirmed with Community Observers at the bridge construction site that Monosulfidic Black Ooze (MBO) has been removed from the riverbank. The first event documented by Observers occurred on the 29th and 30th October 2018. It appears removal has been ongoing since that date (see photographs, Tab A).

The RTA document Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze, issued April 2005 says:

"4.2 Monosulfidic Black Ooze
Monosulfides are also known as acid volatile sulfur (ie. they release hydrogen sulfide when in contact with strong acid) and are also often characterised by high concentrations of heavy metals.

Sullivan and Bush (2002) describe MBO as follows (p 14):

> *'Monosulfidic Black Ooze (MBO) are gels (moisture contents usually >70%), black, often oily in appearance, greatly enriched in monosulfide (ie up to 27% compared to a maximum of 1% for estuarine sediments), high in organic matter (usually >10% organic carbon) and can form thick (ie >1 m accumulations in waterways (eg drains) within ASS landscapes... MBOs are easily mobilised during runoff events and can be distributed into rivers or if flooding occurs, distributed over surrounding landscapes... They have the capability to cause both severe acidification and/or severe deoxygenation of flood waters.'*

The formation of MBO needs a combination of acid sulfate runoff, carbon (eg from plants) and a low flow environment. This combination explains why they tend to be commonly found in drains in coastal ASS areas. Backwater areas that are periodically inundated by salt water are particularly prone to MBO

accumulation. MBO can also form in inland areas where salinisation is occurring.

MBO has been identified in the Macquarie Marshes wetlands, as well as in drains in inland areas affected by salinity (eg. Griffith, Cohuna, Waikerie). Recent work by Sullivan, Bush and Ward (Southern Cross University, reported in the University News) has revealed substantial changes to the ecology of freshwater systems, particularly in irrigated landscapes, due to sulfate salinisation. In the widespread areas where sulfate salinisation is occurring, sulfides occur as monosulfidic ooze, and as accumulation of monosulfide and pyrite. These monosulfidic sediments have the same acidification and deoxygenation potential as those associated with estuarine waterways.

An important distinction between MBO and other ASM is that MBO may continue to form in drains, even after treatment, if conditions are favourable. This means that the presence of MBO presents an ongoing management and maintenance risk that may extend well beyond the road construction period."

The reference, in the above quote, to "drains" is considered significant as Observers advise *"the black ooze taken out near the bridge was right where a storm water outlet is placed, coming from under the road, exiting right at that spot."*

The National Acid Sulfate Soils Guidance: Overview and management of monosulfidic black ooze (MBO) accumulations in waterways and wetlands (2018) says, page 15:

5.2.1 Identification of MBOs
An initial field assessment of sediments may give an indication whether MBOs are present at a site. Unoxidised MBOs typically have a near neutral pH (pH 7–8), together with high organic matter contents and low redox potentials. MBOs also usually have a distinct strong black colour, gel consistence and sometimes an oily appearance ... some MBOs are dark grey in colour."

The RMS has continued to remove material of a dark grey colour, consistent with the above description up until very recently.

11. If advice provided by an RMS employee acknowledging the presence of MBO is correct, when was MBO first identified at the site?
12. Does this date differ from wider concerns regarding the identification of ASM at the site?
13. In addition to information requested in the covering correspondence, CAWB seeks explicit, written confirmation regarding the presence, or otherwise, of ASM and particularly MBO within the project zone; as well as,
14. The publication of all documentation to date regarding this issue.

If ASS or MBO is, or has been, present within the project area:

15. What is the volume of MBO excavated to date?
16. What is the volume of ASS excavated to date?

17. What is the location, extent and volume of all identified MBO within the project zone?
18. What is the location, extent and volume of all identified ASS within the project zone?
19. What is the volume of MBO removed from the site?
20. What is the volume of ASS removed from the site?

Riverbank Instability

The northern riverbank is exhibiting shear properties, consistent with acid sulfate-type soils. The National Guidance document referred to above advises relatively low shear stresses can lead to MBO mobilization.

In fact, riverbank instability:

- Increases the chance of the breakup of ASM and its movement into contact with river water, and increases its exposure to air and river water or groundwater,
- Reduces the shear strength of the failed soil material, making plant access and repair difficult,
- Increases the difficulty of confining ASMs whilst undertaking repairs,
- Increases the chance of failure of ASM directly into the river, especially if the failure surface is partly below the river water level, thereby increasing risks to water quality from acids, dissolved metals and deoxygenation - which can affect fish, livestock and down stream users.

Based on photographic evidence (see Tab A) CAWB believes these matters have been given inadequate consideration in the prosecution of this project. This may have resulted in the mobilisation of MBO; is very probably implicated in the increasingly desperate attempts to stabilise the north bank; and may well be doing shocking, long term damage to the river's ecology.

Treatment of Excavated Material

While Community Observers have not witnessed any treatment, as described in the CASMMP, of excavated material with lime, the EIS for a nearby sand mining proposal advises, for their location, "a very high treatment plan is required". And yet the CASMMP for Windsor Bridge says, "*The highest S% from all the test results is 0.1% which is a very low level acid sulfate soil and would require a liming rate of 5kg/T.*" (Emphasis added) This discrepancy is disturbing, given relevant LEP maps show both projects are located on the same ASS Class 4 soils.

The NSW Acid Sulfate Soils Management Guidelines page 28 says, *"It is recommended that projects involving the treatment of large quantities of acid sulfate soils be undertaken in stages for effective neutralisation management. The acid sulfate soils should be separated from other soils during the excavation, to reduce the quantities of soil requiring treatment."*

Further to this, the CASMMP, page 8, says regarding treatment, *"Volumes of potential PASS/ASS from piling is less and will occur a number of months after the scour protection excavations."* Albeit no treatment appears to be occurring,

CAWB is alarmed this protocol seems to have been completely abandoned, with piling and scour protection activities occurring concurrently.

In terms of the management of excavated material the advice received from Observers, that dark grey sludge, wet from the river was taken by trucks and dumped on top of the piles of "dry" soil stockpiled at the Freemans Reach Road site, much of which came from the southern (Thompson Square) site, is significant. If the sludge was ASM, then consistent with the advice cited above from Acid Sulfate Soils Management Guidelines page 28 that *"...acid sulfate soils should be separated from other soils during the excavation, to reduce the quantities of soil requiring treatment"* this practice will result in contaminants seeping into the dry soil, contaminating that soil. We are advised these piles were part of the material trucked off site.

21. Please advise to date, what weight and quality of "lime" has been used to treat ASM.
22. What weight, not volume, of ASM has been treated to date?
23. What weight of lime will be required to complete the project?
24. What is the total estimated volume of ASM likely to require treatment over the life of the project?

Removal of Excavated Material

Excavated material has generally, in the first instance, been relocated to the designated ASS treatment area, although, as noted above, Community Observers believe no treatment is actually occurring. It is also not clear how batches are tracked and there appears to be little effort invested in keeping soils from different locations segregated, or protecting against cross contamination.

Most recently, what is believed be contaminated and untreated soil (including sludge from the river bank on the north side; material from the ASS treatment area stockpiles, material taken directly from the northern riverbank as well as from the Thompson Square site) has been removed from the construction site and delivered to at least one private property. This action appears inconsistent with the CASMMP for the project, which says (page 15)

> *"1. Final use of treated ASS / PASS*
> *Upon verification of treatment, the neutralised ASS could be re-used on-site for construction (subject to Geotechnical and environmental suitability) or disposed off-site to a suitably licensed waste management facility (additional waste classification analysis / testing may be required). As a precautionary measure when incorporated into general fill for the road it should be buried at least 0.4m from the finished surface level and not to be used in the upper zone of formation."* (Emphasis added)

https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-appendix-b10-construction-acid-sulfate-materials-management-plan.pdf

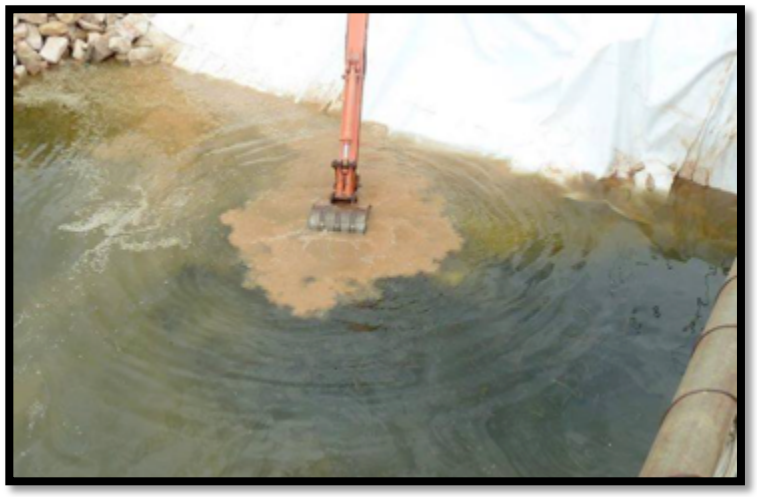
The site known to be receiving excavated material is on Joshua Road, Freemans Reach. There is a current DA for land filling at this property. Some

trucks may also be heading up the Putty Road, although it is also possible to access the Joshua Road site from this direction. There is no known "*suitably licensed waste management facility"* in either direction.

25. CAWB seeks confirmation no ASM has been removed from the site to an unlicenced facility.
26. If ASM is being removed from the site CAWB requests all relevant records be made publicly and easily available.
27. If ASM has been delivered to private properties, in breach of the CASMMP, we seek advice as to what action, both corrective and punitive, regulatory authorities have taken, or will be taking.

Water Quality

CAWB is also anxious the RMS/Georgiou is, for no obvious reason, continuing to dredge and stir up what was presumably, prior to this disruption, a chemically stable riverbank and riverbed. (See image, right; also images at Tab A)



28. An explanation regarding what is happening in the attached photo, an evaluation of the consequences and explanation of its necessity, is requested.
29. What changes have occurred to water quality since the project commenced?

Impacts on the water table

CAWB is alarmed boring equipment used on the south bank is emerging wet from drill sites, implying the drill has gone into the water table. Our understanding is, should there be ASM present, this drilling may have catastrophic consequences.

30. Was the presence of a water table on either the Windsor or Wilberforce side of the river, identified and evaluated prior to project approval?
31. If so, where is this information recorded?
32. Why is boring equipment emerging wet from drill holes?

Re-excavation and Hydrology

The visible, repeated, re-excavation of riverbank sites, an activity captured in the below images (as well as images at Tab A) is arousing concerns in no way allayed by the following statement on the RMS project website:

> *"Over the past few months community members have expressed concern over excavations of large cuttings on the northern riverbank. These cuttings are temporary and necessary in order to allow machinery to safely excavate and place scour rock onto the river bed. To have large machinery operate on the original steep slope would not be safe. These cuttings are being filled in progressively with rock and layers of compacted earthworks which will offer a greater level of stability than the previously existing embankment. There are no issues with slippage on the bank."*

The image below, dated 10 January, clearly shows one example of the "slippage" the RMS says it has no issues with.

The text on the RMS website implies a continuous process of fill and compaction. Again as illustrated in these images, this is not the onsite reality, as the "stabilised" riverbank has actually been re-excavated...more than once.'

It appears this bank "stabilisation" is also resulting in a narrowing of the river at Thompson Square. In light of the sensitivity of hydrological conditions and the potential impacts on flood behaviour this is a matter of considerable concern.

33. Why have sections of the bank been repeatedly re-excavated?

34. CAWB is not aware of any modelling having being done that addresses hydrological changes that may occur as a result of the narrowing of the river (by an estimated 20metres) at Windsor and accordingly asks the relevant authorities to fully and independently investigate this matter and advise the outcome.

An Acid Sulfate Soil Management Plan

As noted previously, D5 (d) (iv) of the Instrument of Approval requires *"a contingency plan, **consistent with** the Acid Sulfate Soils (sic) Manual, to deal with the unexpected discovery of actual or potential acid sulfate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage;"*

However the Acid Sulfate Soil Manual at *6.1, "The need for an Acid Sulfate Soil Management Plan"* says, "An Acid Sulfate Soil Management Plan must be prepared in all circumstances when the *Action Criteria* in Table 4.4 are met or exceeded" and at 4.3 the section headed "Interpretation of the results - Action criteria triggering the need for a management plan" says,

"The *Action Criteria* in Table 4.4 trigger the need to prepare a management plan and are based on the percentage of oxidisable sulfur (or equivalent TPA, TAA) for broad categories of soil types. Works in soils that exceed these action criteria must prepare a management plan and obtain development consent. For projects that disturb >1000 tonnes of ASS soils with ≥ 0.03 % oxidisable sulfur or equivalent existing acidity, a detailed management plan and development consent will be required. "(The obligation to prepare an Acid Sulfate Soils Management Plan before seeking project approval is also clear in other documents of the time, such as the Hawkesbury LEP.)

Table 4.4, as sourced from the Acid Sulfate Soil Manual

Table 4.4. Action criteria based on ASS soil analysis for three broad texture categories

Type of Material		*Action Criteria 1-1000 tonnes disturbed*		*Action Criteria if more than 1000 tonnes disturbed*	
Texture range.McDonald et al. (1990)	*Approx. clay content (% < 0.002 mm)*	*Sulfur trail % S oxidisable (oven-dry basis) eg Sтos or Sros*	*Acid trail mol H⁺/tonne (oven-dry basis) eg, TPA or TSA*	*Sulfur trail % S oxidisable (oven-dry basis) eg Sтos or Sros*	*Acid trail mol H⁺/tonne (oven-dry basis) eg, TPA or TSA*
Coarse Texture Sands to loamy sands	≤5	0.03	18	0.03	18
Medium Texture Sandy loams to light clays	5 - 40	0.06	36	0.03	18
Fine Texture Medium to heavy clays and silty clays	≥40	0.1	62	0.03	18

The CASMMP provides the following comparable table:

Action criteria from the ASSMAC guidelines (1998)

Course Texture (Sands to loamy sands)	>5% clay content	Action criteria 1- 1000T disturbed	Action Criteria >1000T disturbed
SPOS	%	0.03	0.03
Equivalent Acid TPA	mol H+/tonne	18	18

S_{POS} – Peroxide oxidisable sulfur
TPA – Titratable peroxide acidity
TSA – Titratable sulfidic acidity
ASSMAC (1998) guidelines present action criteria as either the concentration of TPA or TSA

The CASMMP says, page 10, "*The Geotechnical Factual Report - Windsor Bridge Replacement Detailed Design (Jacobs 2017) showed 5 boreholes within the alluvial sediment that recorded the net acidity and the Chromium reducible sulphur levels greater than the action criteria (>0.03)*."

The triggering of an Acid Sulfate Soils Management Plan and its obligations are well understood, having been consistently required at least since the publication of the Acid Sulfate Soil Manual in 1995.

In fact, the ASS Guidelines say, "An acid sulfate soil management plan is a fundamental component of any proposal application. The approval authority should assess the adequacy of the management plan before approving a development application, a licence or a lease, and should require the implementation of the plan as a condition of approval."

Online searches have not identified, pre-project approval, any document called "Acid Sulfate Soil/s Management Plan".* It is therefore assumed none exist.

Thus, when D5 (d) (iv) of the Instrument of Approval requires *"a contingency plan, **consistent with** the Acid Sulfate Soils (sic) Manual, to deal with the unexpected discovery of actual or potential acid sulfate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage;"* the reference to a "contingency plan" is taken to include the provision of an overdue "Acid Sulfate Soils Management Plan".

Notwithstanding the slightly different nomenclature used in Appendix B10, viz, "Construction Acid Sulfate Materials Management Sub-Plan" (CASSMP) and particularly given the first objective of the CASMMP is, "...to ensure that the potential impacts from disturbance of acid sulfate soils are minimised', it is assumed that is the intention of the CASMMP.

It appears therefore that the document required by the Instrument of Approval, is both a Management Plan and a Contingency Plan, noting the Acid Sulfate Soil Manual not only recognises and requires an Acid Sulfate Soils Management Plan but also a Contingency plan, saying at "6.5 Contingency Plan":

"A contingency plan must be developed to manage impacts should the management strategies fail. The contingency plan should be developed on a site-specific basis in consultation with the relevant government authorities. The contingency plan is an integral component of the acid sulfate soil management plan that must be developed prior to approval or commencement of the project."

35. CAWB requests an explanation as to why, consistent with the requirements of the Acid Sulfate Soil Manual, an Acid Sulfate Soil Management Plan was not required prior to project approval;
36. CAWB seeks advice as to how the current CASMMP meets the Conditions of Approval with specific reference to the requirements of the Acid Sulfate Soil Manual,
37. CAWB seeks to be assured NO environmental damage has occurred as a result of the aggressive excavation occurring at the project site.

*** Pre-approval documents referring to "acid sulfate/sulphate soil"**
A Google search identified the following EIS documents

Windsor Replacement Bridge
Soil, sediments, water and waste working paper – working paper
7 November 2012
https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-noise-vibration-working-paper-7.pdf

No title page
https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-EIS-chapter-7-6.pdf

Windsor Bridge Replacement
Roads and Maritime
Vegetation Management Plan
IA98200-NEM-RP-313 | Rev 0 June 2018
https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-vegetation-management-plan-june-2018.pdf

Reference list
https://www.rms.nsw.gov.au/documents/projects/sydney-west/windsor-bridge-replacement/windsor-bridge-EIS-chapter-12.pdf

OTHER MATTERS

SafeWork Issues

RMS concerns regarding excavator safety, as reported on the project website, are at variance with observed on-site practices documented by Observers (see Tab A).

Despite acknowledgement of a formal notification to SafeWork regarding an employee smoking whilst fuelling a pile drilling rig (1-396249) and an indication a letter would be sent to Georgiou, there has been no further communication or evidence of a site visit.

There is a continuous problem at the site with the lack of dust control. This is evident both with mechanical digging, and with pile drilling when the operators

shake the soil off those drills that do not emerge wet. Residents are complaining to the Observers about this matter.

Fisheries Issue - Prawn Nurseries

Should the current works affect ASM in the project zone there are serious implications for the Hawkesbury prawn species Metapenaeus Macleayi.

The life cycle of the M. Macleayi is estimated to be around 15 months and starts in the ocean. Fertilized eggs are shed to the bottom of oceanic waters where they remain for a short time before they hatch. The first larval stage, called a nauplius, emerge and swim upwards towards the surface. There are several moult stages and between each stage an increase in size occurs before it becomes a protozoea. Similarly the protozea moults several times before becoming a mysis it is at this stage that it starts to resemble a prawn. (NSW Fisheries State Leaflet No. 8)

The species travels from the ocean as far upstream as North Richmond surviving a range of salinity levels during its journey. The Hawkesbury trawl fishery does not harvest above Lower Portland Ferry as this area is considered to be one of the prime nursery areas for the fishery.

Mary Howard* describes the value of Metapenaeus macleayi and its importance in the maintenance of the food chain in the whole aquatic ecosystem of the Hawkesbury- Nepean River from Broken Bay to Penrith as 'priceless'.

M. macleayi is reportedly food for a multitude of species including Bream, Mullet, Mulloway, Bass, Eels, Whiting, Hairtail, Stingrays, Sole, Squid, Bull Sharks and Crabs.

Howard notes water management affects the survival of juvenile prawns and subsequently affects the overall productivity of the river. She also makes reference, as part of a discussion regarding cumulative impacts, to "Frequent but unrecorded, outbreaks of 'Red Spot' disease (Aphanomyces invadans) in fish" (as noted previously, AS conditions are implicated in red spot disease in fish).

Adverse changes to riverine conditions at Windsor could well sound the death knell for what remains of a once-robust industry. The iconic Hawkesbury oyster has already been replaced with the Pacific oyster due to appallingly poor water management. It would be unconscionable to force another riverine species into extinction.

* Aquatic Ecosystem Productivity Relies on Water Managers and Sustainable Cities, by Mary Howard.
https://www.pc.gov.au/__data/assets/pdf_file/0019/198010/sub041-fisheries-aquaculture-attachment1.pdf

Heritage

CAWB wishes to again draw to the attention of relevant agencies to the completely unsatisfactory treatment of Australian heritage throughout this project.

Most recently, drilling beside the brick barrel drain has resulted in brickwork being fragmented and more colonial bricks being excavated, their ultimate fate or repository, unknown.

Indeed, confirmation of the condition of the brick barrel drain, prior to entombment, as repeatedly requested of the RMS, has not been forthcoming and work practises at the site continually threaten the fabric of the historic structure.

The discovery of not just one, but three historic boats on the north bank and the almost complete silence on these discoveries is not the behaviour expected of public agencies.

Communication

The recent treatment of local residents by the project contractors regarding a further escalation of the project program was unconscionable.

On 1 March Georgiou employees, without any prior arrangement, or the agreement of other parties holding an interest in the property, approached a Thompson Square landowner to discuss an apparent escalation of work, involving the removal of the roundabout. The meeting was held on the side of a very noisy and extremely busy road. It was unanticipated, and dealt with catastrophic issues for the landowners.

During this ad hoc, door-knock meeting, (that property owners had no opportunity to prepare themselves for), detailed information was provided verbally, regarding impacts on a major heritage property.

The person spoken to by Georgiou was then required to sign a document.

The person concerned believed he was signing to acknowledge he had been spoken to.

He was not provided with a copy of what he signed.

Whilst, in the absence of independent witnesses, it is difficult to be certain of exactly what information was conveyed, in subsequent correspondence from Georgiou they say the person approached was told about the 'removal of the roundabout and the median strip on the George and Bridge Street intersection also including the excavation of a service trench for the installation of the traffic control system'.

This correspondence goes on to say the signature provided is evidence the signatory 'acknowledged and understood what was explained to them', however,

it also claims the signature is testament the signatory is aware of what would be occurring and the timings of the work and they have 'no issue' with this.

When one of the other property owners raised the entire matter with them, the response from Georgiou was completely unsatisfactory and failed to acknowledge his status as another owner of the property,

The offer to meet the complainant in “the next 30 minutes” compounds the offence. These discussions were about life-changing matters and the insensitive behaviour of the Georgiou representatives appalling.

Access to Wharf

The Conditions of Approval require public access to the existing wharf to be maintained and alternative coach access; arrangements for pedestrians/ cyclists; and consultation undertaken, to be detailed.

The current pathway to the wharf is manifestly unsatisfactory. On February 22, rocks were taken from the river bank next to the bridge, to approximately where the remains of the Greenway wharf lie buried. An excavator lifted the rocks out of the water and piled them up next to the walkway. While this occurred, the walkway was again closed. However despite the reopening of the path the rocks remain sitting dangerously high above the fence.

CAWB understands access to the wharf continues to be inconsistent.

16.3.19 ADDENDUM TO ORIGINAL BRIEF

CAWB has just been made aware of this photograph, taken by a Community Observer (14/15.3.19)

Last year former RMS bridge engineers suggested it was possible to showcase the Macquarie brick barrel drain without compromising the overall design and function of the replacement bridge. Despite CAWB's repeated requests, the RMS refused, outright, to consider the idea.

The majority of the drain is now entombed, and yet, there is this unexpected photo, of a small section of the barrel drain, taken close to where the shared pedestrian pathway is.

Given the majority of the drain is now sitting under concrete (the equivalent of it being destroyed) it is unknown why this final section was exposed. However it does reveal a last opportunity for authorities to do something positive.

This is the section of the Macquarie structure closest to the river, next to the old coach park. If the plan is to construct a route under the new bridge for coaches, then this is the ideal place to construct a public viewing platform.

On behalf, not only of the 50,000 of so Australians who have put their signatures on documents seeking to save Thompson Square, but also all future Australians, we urgently request the RMS find a way to both display and preserve this remarkable remnant of a highly significant historical structure.
ENDS