



ASSAY

A NEWSLETTER ABOUT ACID SULPHATE SOILS

No.10 June 1996

Included with this issue of ASSAY is a registration form for the second national conference on acid sulfate soils (2NCASS for short) at Coffs Harbour on 5-6 September. If you are reading this on email you can obtain copies of the form by contacting organiser Bob Smith phone 066 283 472 or fax 066 280 653.

Also included in this issue is a database form. If you would like to be included in a publicly available national database of people interested and involved in understanding and managing ASS return the completed form by 31 August. We hope to distribute the first edition at the ASS conference.

National ASS group

The first meeting of the ASS national working group of the Standing Committee on Agriculture and Resource Management (SCARM) was held in Brisbane on 26 April. The group has given itself 12 months to finalise a national strategy. It meets in Cairns in mid-July and at the ASS conference in Coffs Harbour in September. The final membership of the group is:

- Peter Bek, Qld Dept of Environment
- John Beumer, Queensland Dept of Primary Industries, Fisheries & Forestry
- Greg Bowman, CSIRO
- Jeff Champion, National Farmers Federation
- Duncan Leadbitter, Australian Seafood Industry Council
- Bernie Powell, Queensland Dept of Natural Resources
- Ian White, ANU
- John Williams, ASSMAC (chair)
- Rob Williams, NSW Fisheries

For more information on the group contact John Williams 066 261 340.

ASS meetings

The Acid Sulfate Soil Management Advisory Committee (ASSMAC) met in March at Yamba where members inspected aquaculture operations, and a sugarcane farm where the owner has laser-levelled the land and used the overburden to fill in deep drains. In place of the drains are shallow dished, grassed areas which carry off surface water and provide access for machinery.

ASSMAC next meets in Sydney on 12 June. It has two new members, Terry Abbott, NSW Agriculture soil management program leader, who replaces John McKenzie, and Craig Copeland, NSW Fisheries habitat biologist, who replaces Paul O'Connor.

ASSMAC's technical committee met on 16 May in Grafton. Topics discussed included the ASS conference, the analytical guidelines, the ASS maps, research in the Tweed, Macleay and Shoalhaven catchments, management of pyritic sediments separated during sand-dredging in the Tweed River, swamp rehabilitation, and ASS developments in Queensland.

ASS catchment planning

Trevor Flewin has been appointed acting strategic catchment planning officer for acid sulfate soils. He is filling in for Stuart Naylor who is overseas until next year. Trevor is identifying the worst ASS hot spots in each NSW north coast catchment and reviewing all ASS research in these catchments. If you have technical queries about ASS, queries about the ASS maps, or would like to notify him about problem ASS areas, contact him at DLWC's Kempsey office 065 631 212/ fax 065 628 728.

Catchment maps

DLWC has produced 1:100,000 scale maps showing the likelihood of ASS in each river catchment on the NSW coast. The catchments are, from the north, Tweed, Brunswick, Richmond, Clarence, Bellinger, Macleay, Hastings, Manning, Karuah-Great Lakes, Hunter, Lake Macquarie-Tuggerah Lakes, Hawkesbury, Georges River-Port Jackson, Lake Illawarra-Port Hacking, Shoalhaven, Clyde, Moruya, Tuross, Bega and Towamba. The maps are \$35 each and available from Stewart Murray 02 228 6598 or DLWC, GPO 39, Sydney 2001.

Analytical guidelines

We keep promising them, but this time it's for real. Interim guidelines for ASS sampling and laboratory methods are now available. They are 'interim' guidelines because they contain only methods and no interpretations. The ASSMAC technical committee is still working on the interpretations but has decided to release the methods now to standardise methodologies across Australia. The committee hopes to release a full set of guidelines later in the year. Those who have already ordered the guidelines should receive them very soon. If you would like a set, contact Rebecca Lines-Kelly (details on page 4).

Sydney ASS symposium

A one day symposium on acid sulfate soils will be held at the University of Sydney on 29 July. The symposium will look at causes, measurement, effects, rehabilitation and prevention of ASS and the issues these pose for eastern

Australia and Asia. Speakers include some of Australia's foremost experts in ASS: Greg Bowman (CSIRO), Angus Ferguson (SCU), Mike Melville (UNSW), Dave McConchie (SCU), Scott Poynton (Fortech), Jes Sammut (UNSW), Bob Smith (R. Smith & Assoc.), Ian White (ANU), Ian Willett (ACIAR), and John Williams (ASSMAC). Cost is \$125. To register, please send your name, address and cheque or credit card details to The Earth Resources Foundation, Edgeworth David Building F05, The University of Sydney 2006. For more information contact Kim Wright on 02 351 4946/ fax 02 351 3873.

ASS management in cane

The NSW Sugar Milling Co-operative's environment committee has made management of acid sulfate soils its first priority. The industry has published guidelines on drain construction and maintenance; is supporting research into the dynamics of acid production and movement, and suitable control mechanisms; and is undertaking detailed on-farm soil testing and ASS mapping. For more information contact the co-operative's agricultural services manager Peter Nielsen 066 208 257/ fax 066 828 330.

Taree council meeting

Greater Taree City Council and Hastings Council are working together to develop a model Local Environment Plan (LEP) and a model Development Control Plan (DCP) for acid sulfate soils. This follows a meeting called by Taree Council on 16 April to discuss the ASS clause in its new LEP. There has been concern that the clause is too general to be workable. The outcome of the meeting is that the two councils will work together, basing both model plans on the ASS maps. As a result of the meeting the Department of Land and Water Conservation has produced a revised version of the maps which combines high and low probability and differentiates only on depth of the potential ASS layer below the soil surface. This depth will determine council's requirement for development approval. For more information contact Debbie McKenzie at Hastings Shire Council 065 832 099/ fax 065 843 809, or Trevor Fitzpatrick at Greater Taree City Council 065 913 249/ fax 065 913 311.

Manning drains project

Following concern from Manning landholders about Greater Taree City Council's proposal to require a development application for any drain maintenance work, Manning ASS local advisory committee has applied for Landcare funding to develop a drainage management plan. The project involves local drainage unions and landholders and aims to

- map all drains in the catchment onto Greater Taree City Council's GIS;
- measure and map the depth of each drains and the depth to the ASS layer relative to the drain base, working with individual landowners;
- determine appropriate maintenance strategies for each drain

- combine the strategies and maps into drain management plans for each drainage union
- use these management plans to help Council staff develop a Development Control Plan (DCP) for ASS drain management, and help drainage unions submit management plans as development applications for council

Manning ASSLAC hopes the project will reduce accidental acid water discharge from drains. The project has received regional approval and now goes forward for state assessment. For more information contact Manning Catchment Management Committee co-ordinator Carl Atchison on 065 522 788, fax 065 522 047.

Fishwatch case

In March the NSW Land and Environment Court declared that drainage works undertaken for a sugar cane development required the approval of Lismore City Council. The recreational fishing organisation Fishwatch had taken the landowners to court for not obtaining approval for the drainage works. The court required the landowners to prepare a strategic plan for drain management to ensure that water discharging from the drains into a public drain is pH 5 or above.

ASS workshops for local government

Yolande Stone, senior environmental planning officer with Dept of Urban Affairs & Planning, is organising a series of workshops for local government staff later this year after the ASS conference. The workshops will cover the ASS component of Environmental Impact Statements, State of Environment Reports and development applications. Councils will be notified once the workshops are organised.

Tuckean workshop

Landholders in the Tuckean Swamp near Alstonville met with technical advisers on 17 May to discuss ASS management alternatives for the swamp. After an introduction by Tuckean Project co-ordinator Jane Baldwin and a talk by Macleay landowner Russell Yerbury who has ponded some of his ASS-scalded land with good results, participants toured the swamp which in some areas was still extensively flooded due to heavy rains the previous week. A roundtable discussion over possible management schemes resulted in a decision to concentrate on the worst hot spot in the swamp. NSW Agriculture officers Roy Lawrie (soil scientist), Terry Launders (agronomist), Graeme Robertson (drainage specialist) and Col Ahern of Qld Dept of Natural Resources will inspect the site with landholders this month and develop a management strategy. For more information on the Tuckean Project contact Jane Baldwin 066 286 081/ fax 066 285 680, or Craig Copeland 066 261 394/ fax 066 261 202.

Liming trial

A liming trial on bare drain spoil in the Tuckean swamp is showing spectacular grass growth. Landowner John Garbutt has planted paspalum, rhodes grass, setaria and

ryegrass. Results of the trial will be available for the next edition of ASSAY. For more information contact Tuckean project officer Jane Baldwin on 066 286 081.

Pastures in ASS

NSW Agriculture has applied for Landcare funding to trial suitable pasture species for areas in the Manning catchment where the potential acid sulfate soil layer is within one metre of the soil surface. For more details contact Taree district agronomist Dave McCoy on 065 527 299, fax 065 512 253.

Clarence information morning

Some 60 landowners and other interested people attended an information morning on ASS at Harwood in the lower Clarence on 30 May. The event was organised by the Clarence Catchment Management Committee, the Clarence Cane Growers Association, and the Maclean Estuary Management Committee. Speakers included Bruce Blunden on ASS formation and location, Rebecca Lines-Kelly on management techniques, Gary Creighton on drainage design, Robert Quirk on Tweed ASS initiatives, and Neil Gregor on ASS initiatives in the Clarence cane industry. Participants then inspected a soil pit showing potential ASS and discussed drainage design options.

ASS and water quality

Angus Ferguson and Brad Eyre of Southern Cross University's Centre for Coastal Management have produced a report on acid sulfate soils titled *Local and regional impacts of acid runoff from acid sulfate soil environments in the lower Richmond River catchment*. Sections of the 111 page report will be published in scientific journals over the next few months, but you can photocopy the report yourself at Southern Cross University's libraries at its Lismore and Coffs Harbour campuses, or at Richmond Catchment Management at Alstonville shopping plaza. Ring Brad Eyre 066 203 773 for more information.

Floodplain structures

NSW Fisheries has applied for funding through the National Coastcare Program and the National Landcare Program to look at the 1200 floodplain structures in NSW to see which have potential for rehabilitation and revised management. The main aim of the proposed submission is to improve fish habitat, but the proposal also has implications for ASS management. For more information contact Craig Copeland on 066 261 394.

Fisheries review

The Fisheries Research and Development Corporation is reviewing past Australian fisheries habitat research to develop a national strategy for further research and restoration. The one year review includes summaries of the hazards and risks to fisheries ecosystems of changes to drainage patterns and wetland destruction, pollution, effects of fishing and introduced pests.

The review has interviewed more than 200 habitat scientists and managers and located 2500 published and unpublished reports. The review will produce a bibliography accessible on the internet and summary report to users of coastal and floodplain resources. For more information contact Mike Cappel, AIMS, PMB 3, Townsville MC 4810, phone 077 534 211/ fax 077 725 852, email m_cappel@aims.gov.au.

Yarrahapinni restoration

An area of drained land at Yarrahapinni (between Macksville and Kempsey) is to be reflooded later this year to restore estuarine wetlands. The project was initiated by NSW Fisheries in 1991 to restore over 800 ha of former mangroves, saltmarsh and seagrasses. The wetlands have been degraded by flood mitigation works installed in 1971 to improve agricultural productivity. The land has significant areas of ASS and acid water has often drained off the site. The state government bought the land with funding from DLWC and money obtained by commercial fishers from Environmental Trust grants. A trust will manage the opening of the floodgates later this year subject to environmental assessment, and oversee management of the site. Two major monitoring projects will assess the effects of reflooding on vegetation, birds and benthos, and on fish and invertebrates. Anyone interested in researching or monitoring the effect of reflooding on ASS can contact Craig Copeland 066 261 394.

Treating acid sulfate silt

Neumann Dredging Company Pty Ltd was contracted to supply 700,000m³ of alluvial sand from the Tweed River as part of the Chinderah bypass upgrade for the Pacific Highway. During the dredging process the sand and silts separated. It was found that the silts contained high concentrations of pyrite and therefore had to be managed as potential acid sulfate soils to prevent acidic leachate being generated. Approximately 70,000m³ of potential acid sulfate silt was collected and pumped to settlement and storage ponds.

A series of field and laboratory experiments has been carried out under the supervision of Professor Paul Saffigna of Griffith University to assess treatment options. Experimental data suggests that a controlled oxidation and leachate neutralisation process, described below, may be cost effective.

- The PASS is pumped onto a sand bed to a depth of about 200mm.
- After a few days the PASS and the top 200mm of sand are mixed using a rotary hoe to promote good aeration and leaching.
- Irrigation sprinklers keep the PASS/sand mix moist and rotary mixing is carried out every few days.
- After a few weeks, a full saturation irrigation is applied to leach acidic products and residual salts. The leachate is pumped from the sand bed into a pond for treatment.
- Water is discharged from the neutralising pond in accordance with a licence issued by the Environ-

mental Protection Authority (EPA). pH, suspended solids, iron and aluminium are monitored as part of the EPA licence conditions.

- The silt/sand mix is tested to determine the Net Acid Generating Potential (NAGP). If NAGP is positive, the appropriate amount of lime is added.
- Various organic amendments may be added to improve the agronomic properties of this mix, making it appropriate for sale as garden soil.

Indications are that this silt/sand mix can be treated by promoting oxidation and leaching in a safe and controlled manner. For more information, contact David Smith, Neumann Contractors 07 5589 2700.

ASS management on the Gold Coast

Gold Coast City Council is developing an ASS management policy designed to ensure that any proposed works, particularly in coastal lowlands, are fully assessed before any soil disturbance. The draft policy was available for public comment during May. The proposed policy covers the following activities:

- any activity involving ASS
- excavation below 5 metres AHD
- disturbance of soil below the watertable
- excavation which alters local or regional hydrology
- activity in areas identified as containing PASS

For more details, contact John Carleton 07 5581 6140, fax 07 55816346.

Gold Coast City Council is also providing additional funds to the Queensland Acid Sulfate Soils Investigation Team (QASSIT) to undertake more detailed mapping of the Carara and Elanora floodplain. QASSIT is negotiating with Trevor Graham of the Australian Geological Survey Organisation, Greg Bowman of CSIRO, and the council to look at linking detailed ground truth data to remotely sensed and seismic data for more effective geomorphic interpretation and as mapping tools. For more information contact QASSIT team member Col Ahern 07 3896 9510.

ASS sampling procedures in Qld

A second draft of Environmental Impact Statement procedures for sampling lowland ASS areas in Queensland is now available from Col Ahern of QASSIT. Some councils now require developers or consultants to contact QASSIT to design a sampling plan and require a QASSIT member to attend the actual sampling. For more information, contact Col Ahern 07 3896 9510 fax 07 3896 9898.

Exchange samples

A number of ASS samples have been prepared by the soils laboratory at the Resource Sciences Centre, Indooroopilly. Samples will be distributed among government and university laboratories to allow comparison of methods and results. Co-ordinator for obtaining exchange samples is Dennis Baker 07 3896 9477.

David Dent visit

International ASS expert David Dent visited Queensland last month to undertake a consultancy, and was also a guest of the Dept of Natural Resources. He inspected sites at Maryborough, Woodgate, Bundaberg, the Gold Coast and Bribie Island and was surprised at the quantity of pyritic sands.

Qld ASS mapping

Former UNSW student Justin Adams has enrolled as a University of Queensland Masters candidate and will be investigating ASS mapping methods. He will be working with the Department of Natural Resources on its Landcare-funded project 'Risk mapping acid sulfate soils in SE Queensland'.

Totally wild ASS

The environment show Totally Wild recently taped footage in south-east Queensland for a segment on acid sulfate soils. The segment stars Dept of Natural Resources offices Bernie Powell and Doug Smith and will be shown nationally on Network 10 mid to late June.

ASS in India

Jes Sammut (UNSW) has completed a collaborative project with Dr Mohan from the College of Fisheries, University of Agricultural Sciences, Bangalore, India. Jes and Dr Mohan covered a 200 km transect of estuarine floodplain between Goa and Mangalore in Karnataka State, India. They sampled acid sulfate soils and water quality in areas where EUS ('red spot') outbreaks were recurrent. EUS was not linked to local acid sulfate soils because the soils were mostly unoxidised and no mass transport of acid occurred. Other water quality changes associated with the monsoon are the probable triggers of EUS outbreaks for the area. Other environmental factors that trigger EUS in Asia and freshwater fish ponds in Australia are being investigated by the ACIAR project team. Jes and Dr Mohan found major soil acidification in hundreds of hectares of abandoned prawn farms where soil pHs of 2 were common. The ponds were also affected severely by iron oxides. Acid sulfate soils were not previously recorded from the area and have, therefore, never been recognised as a problem.

Jes and Dr Mohan have developed a teaching component for the University of Agricultural Sciences' aquaculture course and are organising extension of the research as well as educating local soil surveyors on ASS identification. The findings of the work were presented at the College of Fisheries' Mangalore campus by Jes in March and will be discussed at upcoming conferences and symposiums here and overseas. The project was funded by ACIAR as part of its EUS project.

For more information contact Jes Sammut 02 385 6211/ fax 02 313 7878, or j.Sammut@unsw.edu.au on email.

ASS colour booklet

The 24 page colour booklet *An introduction to acid sulfate soils*, has proved so popular that it has already been

reprinted. The first 10,000 copies were all out in the community by the end of April, three weeks after being released on 1 April. When Federal Minister for the Environment, Senator Robert Hill, launched the booklet at Sydney Fish Markets on 15 May, it was out of print. The reprint has been funded by ASSMAC and NSW Agriculture. The booklet has been distributed to NSW drainage unions, NSW cane farmers, NSW coastal councils, coastal offices of government agencies in NSW and Queensland, agricultural science teachers, environment groups and the general community. If you would like some to distribute to your organisation or community contact Rebecca Lines-Kelly.

ASS recognition brochure

The brochure *How to recognise acid sulfate soils* has also been reprinted due to demand. If you would like copies please contact Rebecca Lines-Kelly.

New ASS publications

Callinan, R.B., Paclibare, J.O., Reantaso, M.B., Lumanlan-Mayo, S.C., Fraser, G.C., and Sammut, J. EUS outbreaks in estuarine fish in Australia and the Philippines: associations with acid sulfate soils, rainfall and *Aphanomyces*. In *Diseases in Asian Aquaculture II*. M.Shariff, J.R. Arthur & R.P. Subasinghe (eds), p.291-298. Fish Health Section, Asian Fisheries Society, Manila.

ASSAY is published quarterly for the acid sulfate soils information and awareness program, and funded by the National Landcare Program.
Editor: Rebecca Lines-Kelly
 acid sulfate soils information officer
Phone: 066 261 319
Fax: 066 285 925
email: lineskr@agric.nsw.gov.au
 You can now exchange information about acid sulfate soils via the Landcare discussion group on the internet. To subscribe, send a message to
 landcare-request@waite.adelaide.edu.au
 In the body of the text write
 subscribe *your email address*
 You will receive a reply from the group after which you can send messages to the following address:
 landcare-list@waite.adelaide.edu.au

Acid sulfate soils database

ASSAY is compiling a public database of people interested in acid sulfate soils. The database will be available on request, and is a vehicle for encouraging networking and communication about acid sulfate soils. We encourage all people actively working in the ASS area (e.g. researchers, consultants, academics, landowners, managers, government employees etc) to be involved. Inclusion in the database does not imply recommendation by ASSAY, or the Acid Sulfate Soils Management Advisory Committee (ASSMAC) or the technical committee of ASSMAC. If you would like to be included in the database please fill in the form below and send it to Rebecca Lines-Kelly, ASS Database, Wollongbar Agricultural Institute, Bruxner Highway Wollongbar. Deadline for entries is 31 August. We plan to have the first edition of the database available at the ASS conference in Coffs Harbour in September 1996.

Name

Address

.....

.....

.....

Phone

Fax

email

Classification (e.g. landowner, consultant, researcher etc)

Area of interest/expertise (maximum 30 words)

.....

.....

.....

.....

