



International Association of Hydrogeologists

AUSTRALIAN NATIONAL CHAPTER

NEWSLETTER

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FROM THE PRESIDENT

As this is my last opportunity to write to you as President, I wish to thank all of you on behalf of the National Executive for your support and encouragement over the past four years. We have enjoyed serving you and wish the new executive well when they take over in November at Water Down Under. I hope to see many of you at Conference and at our annual meeting there will be an opportunity to reflect on progress to date and where we may go from here. Please feel free to raise any issue of relevance to our group at that meeting.

We trust that you have appreciated having an opportunity to elect a new team to lead IAH for the next four years. This could be part of a trend towards a growing involvement by members in the development of IAH policy in Australia.

We can all be encouraged by the increasing strength of our group. Over the period 1990-94 membership has grown by 44% to over 350 and State Branch activities have gained considerable momentum.

In the coming years, water and groundwater in particular will be increasingly significant matters of concern to the community. As I write, some 83% of New South Wales is drought declared and parts of Queensland are in a similar plight. Drought has, and will be an ongoing feature of the Australian Landscape. What will change in the years ahead will be an increase in demand for a secure drought-proof water supply especially in relation to food production, not only our own but also that for the exploding world population. World population will change from 5 billion in 1994 to 8.5 billion by 2025. It has been forecast* that there will be a worldwide need for an ongoing increased irrigation production of not less than 2.5% per year with an overall increase by 60% by the year 2000 to cope with population demand. It is sobering to put these forecasts beside the amount of land available for increased production which will be about 1%/year. The potential consequences for the environment are clear as the land is pushed harder. Already 20-30 million Ha have been lost to salinity and an extra 60-80 Ha are affected by Salinity*.

Water use in the rapidly urbanising areas of Australia will also have to be rethought. We will really have to face up to the issue that we each actually only use about 5 litres of water/day out of 500 litres in survival cooking and drinking. Of the rest, we send about 200 litres/days/person down the drain to waste after using it briefly and the remaining 295 litres/day/person are put on the garden perhaps inefficiently (high evaporation losses).

I believe we will have to recover the waste (200 litre/day/person) component and reuse it in the not too distant future. This could involve not only the classical treatment methods but innovative ideas such as using aquifers in urban areas for storage of treated waste water followed by its recovery and addition into the water supply system. Urban run off, which is very high, is also a water resource that needs to be looked at critically. Again the concept of aquifers and wetlands as storage/treatment vehicles will have to be evaluated very soon in our major cities.

The coming decade will see groundwater become an important contributor in meeting the need for a sustainable water supply. Competition for use will intensify; people, production and the environment. Let us all play a role in seeing that the appropriate balance is achieved.

In conclusion, on behalf of the National Executive I wish you all a joyous Christmas and a productive new year in 1995.

Michael Knight

* Dr T. Heiler (Pers. Comm) 6th Ministerial Water Forum

NATIONAL COMMITTEE NEWS

TREASURER'S REPORT

Membership Subscriptions for 1994

All members were recently sent invoices for their 1994 subscriptions. If you have not already paid your subscription for the year (\$75), could you please forward it to the Treasurer as soon as possible (or at least before the end of November). My address is given below. Do not send your fees to your State Branch Secretary/Treasurer.

New Members

Membership has continued to grow for about the eighth half year in succession with another 21 new members since our last newsletter. Thanks to all those State branches actively signing up new members and promoting IAH. The following new members are welcomed :

Mr J De Silva (SA)	Ms N Diatloff (QLD) - student
Mr R Hammond (WA)	Miss S Kill (QLD) - student
Mr R Brownbill (VIC)	Mr R Evans (ACT)
Miss S Walker (VIC)	Dr J Mantle (VIC)
Mr W Overton (ACT)	Mr M Jamieson (NT)
Mr P Donnelly (NSW)	Mr C Kraut (WA)
Mr S Collett (WA)	Mr J Pepper (WA)
Mr R Northey (WA)	Mr J Lane (ACT)
Mr G Jensen (QLD)	Mr D Salotti (NSW)
Ms L Forster (QLD)	Dr J Doherty (QLD)
Mr A Tucker (ACT)	

(NOTE. Those who joined after 1 September 1994 are financial members for the balance of 1994 and the whole of 1995 as this is the first year they will receive publications from overseas).

Membership Categories

There have been several enquires recently as to whether IAH offers student and retired membership categories. Members should note that there are only four membership categories. Australian NC membership fees for these categories for 1994 are shown below:

Student - \$45
Individual - \$75
Corporate - \$375
Sponsored - \$115

In order to qualify for student membership you must be under 30 years of age and be in full time education. The category is only available for two years and each student must produce a copy of their id card or have their application certified by academic staff. Please supply me with the relevant details if you wish to change membership categories.

Thankyou

This is my final Newsletter as IAH National Treasurer and as such I would like to thank all members for their support and patience over the last four years. Being Treasurer is never an easy

task with all the necessary communication and financial management, especially when changes abroad with new Executives and reporting arrangements keep you busy. All the best to the incoming National Committee.

Address Changes

Members are reminded to send any changes of address to me at the following address (up until the end of November) :

JB ROSS
IAH Treasurer Fax (02) 5022105
c/- Groundwater Technology (Aust) P/L
17 Forrester St
KINGSGROVE. NSW. 2208

Member's Addresses

The full list of members hasn't been published for 12 months, so here are our 304 members in alphabetical order as at the 7th September 1994.

<u>NAME</u>	<u>TITLE</u>	<u>COMPANY</u>	<u>ADDRESS</u>	<u>TOWN</u>	<u>STATE</u>
ABO	DR F		16 WAHROONGA CRES	GREENSBOROUGH	VIC 3088
ACWORTH	DR R I	UNIVERSITY OF NSW	KING ST	MANLY VALE	NSW 2093
ALAM	DR SMM		69 UNSTED CRESCENT	HILLSDALE	NSW 2036
ALDAM	MR RG	SADME	17 WIGLEY DRIVE	McLAREN VALE	SA 5171
ALLEN	DR AD	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	PERTH	WA 6004
ANDERSON	MR RB	COFFEY PARTNERS	13 WAVE ST	HAMPTON	VIC 3188
		INTERNATIONAL			
ANDERSON	MS JD	DWR NSW	PO BOX 3720	PARRAMATTA	NSW 2124
ANDREWS	MR MJ	GW TECHNOLOGY	1 BUNGARRA ST	HILLBANK	SA 5112
ANNING	MR JM	PAWA	8 CAVENAGH ST	DARWIN	NT 0801
APPLEYARD	DR SJ	GEOLOGICAL SURVEY OF WA	9 ALBERT ST	MOSMAN PARK	WA 6012
ARMSTRONG	MR D	LISDON ASSOCIATES	77 HAWTHORNEDENE DR	GENALTA	SA 5052
BADDOCK	MR L	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	PERTH	WA 6004
BARBER	DR C	CSIRO	17 ALLPIKE RD	DARLINGTON	WA 6070
BARNETT	MR JC	DAMES AND MOORE	4 BIRD RD	KALAMUNDA	WA 6076
BARNETT	MR SR	SADME	PO BOX 151	EASTWOOD	SA 5063
BARTLEY	MR JG		17 DALLY ST	CLIFTON HILL	VIC 3068
BASOCAK	MR C		4 THAMOS COURT	HAMPTON PARK	VIC 3976
BATCHELOR	DR DAF	SIMMONDS AND BRISTOW	65 BLUE GRASS CRESCENT	EIGHT MILE PLAINS	QLD 4113
BAULD	DR J	AGSO	PO BOX 378	CANBERRA	ACT 2601
BAWDEN	MR J		PO BOX 1184	NHULUNBUY	NT 0881
BEDFORD	MR KA	QLD WATER RESOURCES COMMISSION	4 WOORAMA RD	THE GAP	QLD 4061
BENTON	MR SG	KINHILL METCALF & EDDY	PO BOX 28	RAILWAY SQUARE	NSW 2000
BERHANU	MR ZZ	DEPT OF WATER RESOURCES NSW	PO BOX 3720	PARRAMATTA	NSW 2124
BERRY	MR KA	WESTERN MINING CORPORATION	PO BOX 91	BELMONT	WA 6104
BEST	MR PJ	PLANNING DEPT	BHP IRON ORE	NEWMAN	WA 6753
BINCH	MR I	COFFEY PTNRS INTERNATIONAL P/L	PO BOX 4011	EIGHT MILE PLAINS	QLD 4113
BISH	MS S	DEPT OF WATER RESOURCES NSW	9 LYON AVE	TURRAMURRA	NSW 2074
BLAKE	MR R	R BLAKE AND ASSOCIATES	871 STATION ST	NORTH CARLTON	VIC 3054
BOGODA	MR KR	DEPT OF WATER RESOURCES NSW	PO BOX 205	DENILQUIN	NSW 2710

BOLGER	MR P	CMPS & F	390 ST KILDA RD	MELBOURNE	VIC 3004
BOLTON	MR G	ROCKWATER PTY LTD	10 PEBBLE BEACH EDGE	CONNOLLY	WA 6027
BORNMAN	MR JC		PO BOX 206	ALBANY	WA 6330
BOWYER	MR DG	SANTOS LTD - EXPLORATION/DEVEL	101 GRENFELL ST	ADELAIDE	SA 5000
BOYES	MR B		8 TAMAR CLOSE	WILSON	WA 6107
BRADD	MR JM	ANSTO	48 WALTER ST	MORTDALE	NSW 2223
BRADLEY	MR JW	RURAL WATER CORPORATION	590 ORRONG ROAD	ARMADALE	VIC 3350
BRINKLEY	MR AJ	HYDROTECHNOLOGY	590 ORRONG RD	ARMADALE	VIC 3143
BRODIE	MR R	AGSO	PO BOX 378	CANBERRA	ACT 2601
BROUGHTON	MS AK	DEPT OF WATER RESOURCES NSW	PO BOX 548	GUNNEDAH	NSW 2380
BROWN	MR LJ	INST GEOLOGICAL & NUCLEAR SCI	PO BOX 30368	LOWER HUTT	WELLT'ON
BROWNBILL	MR RJ		100 BOISDALE ST	MAFFRA	VIC 3860
BRUMLEY	MR J		49 UNWIN ST	TEMPLESTOWE	VIC 3106
BRUNNER	MR I	DAMES AND MOORE	11 EMPEN CRT	LEEMING	WA 6155
BULMAN	MS T	ADI - IDD	LOCKED BAG 80	LIDCOMBE	NSW 2141
CALAITZIS	MR P		38 PHILIPSON ST	ALBERT PARK	VIC 3206
CALLOW	MR IP		39 TAJT STREET	TEWANTIN	QLD 4565
CALVERT	MR CH	UNI OF NSW - WATER RESEARCH LAB	KING ST	MANLY VALE	NSW 2093
CAMPBELL	MR GD	GRAEME CAMPBELL AND ASSOC	17 DRAYTON COURT	WESTFIELD	WA 6112
CARAPINA	MS SM	ADI - IDD	PO BOX 22	HIGHPOINT CITY	VIC 3032
CARMICHAEL	MT T	CAMP SCOTT AND FURPHY	PO BOX 201	CHATSWOOD	NSW 2068
CAROSONE	DR F	AGC - WOODWARD CLYDE P/L	11/19 GOODCHAP RD	CHATSWOOD	NSW 2067
CARR	DR RS	LAWSON & TRELOAR PTY LTD	PO BOX 799	NORTH SYDNEY	NSW 2060
CASEY	MR DA	IN - SITU AUSTRALIA P/L	GPO BOX 1630	SYDNEY	NSW 2001
CHANDLER	MR M	DAMES AND MOORE	85 THE ESPLANADE	SOUTH PERTH	WA 6151
CLARK	MR G	NEWMONT	38 TALBOT DVE	KINGSLEY	WA 6028
COBB	MR M	WATER SEARCH	PO BOX 191	ANGASTON	SA 5353
COCK	MR PL		79 MARY ST	COMO	WA 6152
CODY	MS SJ	WESTERN MINING CORP	PO BOX 91	BELMONT	WA 6104
COLEMAN	MR B		14 OXFORD CLOSE	CROYDON HILLS	VIC 3138
COLLETT	MR SE	WOODWARD - CLYDE P/L	2 LEA CLOSE	ROSSMOYNE	WA
COLLIN	MR D	DEPT OF WATER RESOURCES NSW	1 WATTLE CRESCENT	MOREE	NSW 2400
COLMAN	MR R	COLMAN GROUNDWATER	209 CRAWFORD RD	INGLEWOOD	WA 6052
COMMANDER	MR DP	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	PERTH	WA 6004
COX	MR R	QLD WATER RESOURCES COMMISSION	4 WELLDAN ST	THE GAP	QLD 4061
COX	DR J	CRC - SOIL AND LAND MANAGEMENT	13 KOORAWEERA ST	HALLETT COVE	SA 5158
COX	DR ME	SCHOOL OF GEOLOGY - QUT	GPO BOX 2434	BRISBANE	QLD 4001
DAHLHAUS	MR PG	GEOLOGY DEPT BALLARAT UNI	PO BOX 683	BALLARAT	VIC 3353
DALE	MR MJ	GROUNDWATER TECHNOLOGY P/L	35 BELMORE ST	ROZELLE	NSW 2039
DANIELS	MR CW	GEO - ENG AUSTRALIA P/L	PO BOX 92	MORWELL	VIC 3840
DAVIDSON	MR WA	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	PERTH	WA 6004
DAVIES	DR JR	JIM DAVIES & ASSOCIATES	PO BOX 117	SUBIACO	WA 6008
DAVIS	DR GB	CSIRO DIV OF WATER RESOURCES	PRIVATE BAG	PO WEMBLEY	WA 6014
DAWKINS	MR AP	ENVIRONMENTAL & EARTH SCIENCES	21 WARWICK ST	STANMORE	NSW 2048
DAY	MR C	DEPT OF CONSERVATION & ENVIRON	PO BOX 401	BENDIGO	VIC 3550
DE SILVA	MR J	SADME	CEDAR AVE	NARACOORTE	SA 5271
DEENEY	MR AC	DAMES AND MOORE	LEVEL 10 636 ST KILDA RD	MELBOURNE	VIC 3004
DEKTYAREV	MR S		5/69 GEELONG ST	EAST BRISBANE	QLD 4169
DEMPSTER	MR D	QWRC	PO BOX 910	BUNDABERG	QLD 4670
DEROSARIO	MR PC	RESOURCE INVESTIGATIONS	78 HENRY ST	EAST CANNINGTON	WA 6107
DIATLOFF	MS N		52 LANCING ST	PULLENVALE	QLD 4069

DILLON	DR P	CENTRE FOR GROUNDWATER STUDIES	PRIVATE BAG 2	GLEN OSMOND	SA 5064
DIMOS	MISS A	RWC	590 ORRONG RD	ARMADALE	VIC 3143
DOHERTY	DR J	DPI	45 COOK ST	OXLEY	QLD 4075
DOMAHIDY	MR GC	ROCKWATER PTY LTD	84 TATE ST	WEST LEEDERVILLE	WA 6007
DONNELLY	MR PJ	DEPT OF PLANNING	2/6 LETITIA ST	OATLEY	NSW 2223
DOYLE	MR SJ	KH MORGAN AND ASSOCIATES	10/4 QUEEN ST	BENTLEY	WA 6102
DUDDING	MR M	HYDROTECHNOLOGY	590 ORRONG RD	ARMADALE	VIC 3143
DUJDEON	MR BA	AGC WOODWARD - CLYDE P/L	273 ALFRED ST NTH	NORTH SYDNEY	NSW 2060
DUNDON	MR P	AGC - WOODWARD CLYDE P/L	486-494 PACIFIC HWY LVL 6	ST LEONARDS	NSW 2065
EASTON	MR MN	PETER RAMSAY & ASSOC P/L	10/222 KINGSWAY	SOUTH MELBOURNE	VIC 3205
ELDER	MR GM	DEPT OF WATER RESOURCES	1/35 SPRING STREET	MELBOURNE	VIC 3000
ELLIOTT	MR JM	CUMEC PTY LTD	66 GIPPS ST	BALMAIN	NSW 2041
ELLIS	MR RI	QLD WATER RESOURCES COMMISSION	PO BOX 316	MOOROOKA	QLD 4105
EVANS	MR PA	QLD WATER RESOURCES COMMISSION	42 LINCOLN GREEN DRIVE	FORESTDALE	QLD 4118
EVANS	MR WR	AGSO	GPO BOX 378	CANBERRA	ACT 2601
EVANS	DR R	HYDROTECHNOLOGY	5 PLEASANT AVE	KEW	VIC 3101
EVANS	MR SL	DEPT OF ENVIRON & NAT RESOURCES	PO BOX 22	PORT LINCOLN	SA 5606
EYRE	MR BD	GEOLOGY DEPT, QLD UNI OF TECH.	GPO BOX 2434	BRISBANE	QLD 4001
FOONG	MR YK	CMPS AND F	11 ORIENTOS CRT	CARINDALE	QLD 4152
FORTH	MR JR	GROUNDWATER RESOURCE CONS	136 SEVENTEEN MILE ROCKSRD	OXLEY	QLD 4075
FOSTER	MS LM	DPI	18 LYNDAL CRT	MORAYFIELD	QLD 4506
FOTHERGILL	MR AJ	DAMES AND MOORE	25 BUCKHURST ST	STH MELBOURNE	VIC 3205
FREE	MR D L	QLD WATER RESOURCES COMMISSION	11 KATOOMBA CRESCENT	TOOWOOMBA	QLD 4350
FURNESS	MR LJ	DJ DOUGLAS AND PARTNERS P/L	27 JEAYS ST	BOWEN HILLS	QLD 4006
GATES	MR G	DEPT OF WATER RESOURCES NSW	PO BOX 3720	PARRAMATTA	NSW 2124
GEORGE	DR R	DEPT OF AGRICULTURE	PO BOX 1231	BUNBURY	WA 8230
GIBSON	DR DK	ANSTO	PRIVATE BAG 1	MENAI	NSW 2234
GUBA	MR SM		2A/19 MARINE PARADE	ST KILDA	VIC 3182
HABERMEHL	DR MA	AGSO	GPO BOX 378	CANBERRA	ACT 2601
HADWEN	MR JP		5/34 MERNDA AVE	GLENHUNTLY	VIC 3163
HAIR	MR ID	WOODWARD-CLYDE P/L	49 PARK RD	MILTON	QLD 4064
HALL	MR JW	AGC - WOODWARD CLYDE P/L	6 QUALTROUGH STREET	BURANDA	QLD 4102
HAMMOND	MR RD	WAWA	147 KITCHENER RD	ALFRED COVE	WA 6154
HANCOCK	MR S	AGC - WOODWARD CLYDE P/L	649 BRIDGE RD	RICHMOND	VIC 3121
HARMAN	MR J	MACKIE MARTIN & ASSOCIATES	34 ALTON TCE	THE GAP	QLD 4061
HARRIS	PROF P		8 DOONAN RD	NEDLANDS	WA 6009
HARRISON	MR AK	HYDROTECHNOLOGY	590 ORRONG RD	ARMADALE	VIC 3143
HARWOOD	MR RC	GROUNDWATER TECHNOLOGY P/L	17 FORRESTER RD	KINGSGROVE	NSW 2208
HASELGROVE	MR K	HYDROSEARCH P/L	17 CLEMENTS RD	BOORAGOON	WA 8154
HATLEY	MR RK	AGC - WOODWARD CLYDE P/L	488 PACIFIC HIGHWAY LEVEL6	ST LEONARDS	NSW 2065
HAWKES	MR GE	COFFEY PARTNERS INTERNATIONAL	12 WATERLOO RD	NORTH RYDE	NSW 2113
HAYTER	MR MG	DAMES AND MOORE	21 BLACKBURN ST	ST IVES	NSW 2075
HELM	DR DC	NEVADA BUR OF MINES & GEOLOGY	UNI NEVADA / 178	RENO NV89557-0088	NEVADA
HILLIER	MR JR	QLD WATER RESOURCES COMMISSION	38 LYTHAM ST	INDOOROOPILLY	QLD 4068
HIRSCHBERG	DR K	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	PERTH	WA 6004
HITCHCOCK	MR PW	DJ DOUGLAS AND PARTNERS P/L	1 NATIONAL PARK ST	NEWCASTLE WEST	NSW 2302
HOLMES	MR DN	WAWA	45 HESTER WAY	GREENWOOD	WA 6024

HORN	MR AM	QWRC	47 BARRYMOUNT CRESCENT	TOOWOOMBA	QLD 4350
HOWE	MR P	WOODWARD CLYDE P/L	5TH FLOOR 233 ADELAIDE TCE	PERTH	WA 6000
HOXLEY	MR G	RWC - HYDROTECHNOLOGY	12 MITARM CLOSE	MT EVELYN	VIC 3786
HUMPHREYS	MR GL	PAWA	GPO BOX 1096	DARWIN	NT 0801
HUNDI	MR N		2/27 UNARA ST	CAMPSIE	NSW 2194
HUXLEY	MR WJ	QLD WATER RESOURCES COMMISSION	GPO BOX 2454	BRISBANE	QLD 4001
IFE	MR D	AGC - WOODWARD CLYDE	40 VICTORIA RD	EAST HAWTHORN	VIC 3123
INGPEN	MRS BJ	GROUNDWATER TECHNOLOGY P/L	3/56 SUTHERLAND RD	ARMADALE	VIC 3143
INGRAM	MR T	RURAL WATER CORPORATION	11 GREEN ST	EAST RINGWOOD	VIC 3135
IRVINE	MR DW	AGC - WOODWARD CLYDE	35 COOLGARDIE ST	SUNNYBANK HILLS	QLD 4108
JACOBSON	MR G	AGSO	GPO BOX 378	CANBERRA	ACT 2601
JAMIESON	MR MC	PAWA	PO BOX 1521	ALICE SPRINGS	NT 0870
JENSEN	MR GR	DPI	PO BOX 910	BUNDABERG	QLD 4670
JEWELL	MR CM	CM JEWELL AND ASSOCIATES	4 PANORAMA CRESCENT	WENTWORTH FALLS	NSW 2782
JIWAN	DR JS	DEPT OF WATER RESOURCES	8 TALBOT ST	GUILDFORD	NSW 2161
JOYCE	MR EB	DEPT. OF GEOLOGY	UNIV. MELBOURNE	PARKVILLE	VIC 3052
KARP	MS D	POWER AND WATER AUTHORITY	PO BOX 1096	DARWIN	NT 0801
KATOPODIS	MR T	DJ DOUGLAS AND PARTNERS	12/43 ARMADALE ST	ARMADALE	VIC 3143
KERN	MR AM	GEOLOGICAL SURVEY OF WA	74 FINNERTY ST	KARRINYUP	WA 6018
KIDD	MR C	AGC - WOODWARD CLYDE P/L	486 PACIFIC HWY LEVEL 6	ST LEONARDS	NSW 2065
KILL	MS SJ		ENDEAVOUR RD	BEERBURRUM	QLD 4517
KNIGHT	DR MJ	NATIONAL CENTRE GW MANAGEMENT	54 WATTLE ROAD	JANNALI	NSW 2228
KONTOS	MR NA	COFFEYS	12 WATERLOO RD	NORTH RYDE	NSW 2113
KRAUT	MR C	WOODWARD - CLYDE P/L	5TH FLOOR 233 ADELAIDE TCE	PERTH	WA 6000
KUCHAKPOUR	DR A		73 AITKEN DRIVE	WINTHROP	WA 6150
LAING	MR C	ACM LAING AND ASSOC	3319 MOGGILL RD	BELLBOWRIE	QLD 4070
LAIT	MR RW	QLD WATER RESOURCES COMMISSION	6 PETERS ST	MAREEBA	QLD 4880
LAKEY	MR RC		32 BLAIR ST	COBURG	VIC 3058
LANE	MR AP	DJ DOUGLAS AND PARTNERS	31 CREMORNE ST	RICHMOND	VIC 3121
LANE	MISS J	AGSO	GPO BOX 378	CANBERRA	ACT 2600
LAU	MRS JE	GC & JE LAU & ASSOCIATES	51 INVESTIGATOR ST	RED HILL	ACT 2603
LAWRENCE	DR CR	SCHOOL OF EARTH SCIENCES	UNIVERSITY OF MELBOURNE	PARKVILLE	VIC 3052
LAWS	MR AT	GEOLOGICAL SURVEY OF WA	8 ILLAWONG WAY	KINGSLEY	WA 6026
LAWSON	MR SJ	DEPT OF WATER RESOURCES	PO BOX 156	LEETON	NSW 2705
LE	MR VT	ADI	GRD FLOOR 77 PARRAMATTA RD	SILVERWATER	NSW 2141
LEACH	MR L		7 TWELFTH A AVE	HOME HILL	QLD 4806
LEE	MR IR		62 CANN AVENUE	BULLCREEK	WA 6149
LEECH	MR SJ	PANCONTINENTAL MINING P/L	PO BOX 1161	KALGOORLIE	WA 6430
LEWIS	MS M	DEPT OF AGRICULTURE WA	YORK RD	NORTHAM	WA 6401
LYDD	MR J		36 EDWARD ST	NTH. ROCKHAMPTON	QLD 4701
LOCKINGTON	DR DA	DEPT OF CIVIL ENGINEERING	UNIVERSITY OF QUEENSLAND	BRISBANE	QLD 4072
LOVE	MR AJ	SADME	PO BOX 151	EASTWOOD	SA 5063
LUCAS	MR KG		GPO BOX 2514	BRISBANE	QLD 4001
LYTTON	MS LM	DEPT OF WATER RESOURCES	12 KURRAWA AVE	COOGEE	NSW 2034
MACKIE	MR CD	MACKIE MARTIN AND ASSOCIATES	9 BLAXLAND RD	RHODES	NSW 2138
MACUMBER	DR P	DEPT OF WATER RESOURCES	20 RANGEVIEW RD	MITCHAM	VIC 3132
MANTLE	DR JDG	RUST PPK	5/178 CECIL ST	WILLIAMSTOWN	VIC 3016

MARTIN	DR RE	MACKIE MARTIN - PPK	PO BOX 654	NEDLANDS	WA 6009
MARTIN	MR MW	GEOLOGICAL SURVEY OF WA	100 PLAIN ST	EAST PERTH	WA 6004
MATHWIN	MR TW		RMB 571	KOJONUP	WA 6395
MERRICK	MR N	NATIONAL CENTRE GW MANAGEMENT	UNIVERSITY OF TECHNOLOGY	BOX 123 BROADWAY	NSW 2007
MEYER	MR GM	WESTERN MINING CORPORATION LTD	PO BOX 91	BELMONT	WA 6104
MIDDLEMIS	MR H	WATER MANAGEMENT CONSULT. UK	2/3 WYLE COP	SHREWSBURY UK	SY1 1UT
MILNE-HOME	DR W	NATIONAL CENTRE GW MANAGEMENT	UNIVERSITY OF TECHNOLOGY	BOX 123 BROADWAY	NSW 2007
MOLLIKA	MR FJ	GHD	380 LONSDALE ST	MELBOURNE	VIC 3000
MONCRIEFF	MR JS		36 SAMSON ST	WHITE GUM VALLEY	WA 6162
MOORE	MR RR	SELF-EMPLOYED	39 MEECHAUM WAY	KARRINYUP	WA 6018
MORGAN	MR KH	K H MORGAN & ASSOCIATES	10/4 QUEEN ST	BENTLEY	WA 6102
MULVEY	MR PJ	ENVIRONMENTAL & EARTH SCIENCES	PO BOX 380	NORTH SYDNEY	NSW 2060
McAULEY	MR CV		78 LEWISHAM RD	PAHRAN	VIC 3518
McAVAN	MR J	WATER AUTHORITY OF WA	24 COLGRAVE WAY	DUNCRAIG	WA 6023
McCARTHY	MR DG	RUST - PPK	23 CORELLA ST	NURIOOTPA	SA 5355
McDONALD	MR P	POWER AND WATER AUTHORITY	PO BOX 1521	ALICE SPRINGS	NT 0871
McGANN	MR MP	C/- WS ATKINS INTERNATIONAL	PO BOX 2985	RUMI 112	OMAN
McGARRY- HEATON	MR P	DEH	2/18 MEADOW ST	MACKAY	QLD 4740
McGOWAN	MR RJ	DAMES AND MOORE	85 THE ESPLANADE	SOUTH PERTH	WA 6151
McINTOSH	MR K	ALCOA OF AUSTRALIA LTD	PO BOX 252	APPLECROSS	WA 6153
McLAUGHLAN	DR R	NATIONAL CENTRE GW MANAGEMENT	UNIVERSITY OF TECHNOLOGY	BOX 123 BROADWAY	NSW 2007
McMAHON	MR GA	STUDENT QLD UNI OF TECH	19 POLLUX AVE	COOPAROO	QLD 4151
McNAMARA	MS JM	AGC - WOODWARD CLYDE P/L	LVL 6 486-494 PACIFIC HWY	ST LEONARDS	NSW 2065
McNULTY	DR AJ	MACKIE MARTIN - PPK	PO BOX 654	NEDLANDS	WA 6009
NANDAN	MR M		27 VUNA RD	SAMABULA 3 MILES	SUVA
NIDAGAL	MR V	GEOLOGICAL SURVEY OF WA	33 TODD AVENUE	COMO	WA 6152
NIELD	MR SP	NIELD CONSULTING	16 BULIMBA RD	NEDLANDS	WA 6009
NOLAN	MR JG	GHD	9 BELFORD AVE	KEW EAST	VIC 3102
NORTHEY	MR RA	WOODWARD - CLYDE P/L	5TH FLOOR 233 ADELAIDE TCE	PERTH	WA 6000
NOTT	MR RB	RURAL WATER CORPORATION	13/10 HIGHBURY GROVE	PRAHAN	VIC 3181
MUNN	MR AA	CMPS & F	390 ST KILDA RD	SOUTH MELBOURNE	VIC 3004
O'BOY	MR CA	C/- MINISTRY OF WATER RESOURCES	PO BOX 1067	SALALAH 211	OMAN
O'NEILL	MR KM	GOLDER ASSOCIATES	35 HUME ST	CROWS NEST	NSW 2085
ORRORKE	MS ME	RURAL WATER CORPORATION	590 ORRONG RD	ARMADALE	VIC 3143
O'ROURKE	MR M		36 CUMMING ST	BURWOOD	VIC 3125
OAKES	MR A	RURAL WATER CORPORATION	23 HIGHGATE GROVE	ASHBURTON	VIC 3147
OLSEN	MR CE	GROUNDWATER TECHNOLOGY P/L	3 TEAKLE RD	OSBORNE PARK	WA 6017
OLSHINA	MR A	GEOLOGICAL SURVEY OF VICTORIA	1 DERMOT ST	SOUTH OAKLEIGH	VIC 3167
OTTO	DR C	CSIRO	PRIVATE BAG PO	WEMBLY	WA 6014
OVERTON	MR WWD	AGSO	PO BOX 378	CANBERRA CITY	ACT 2601
PANASIEWICZ	MR R	ROCKWATER P/L	94/99 HERDSMAN PARADE	WEMBLY	WA 6014
PANTELIS	DR G	ANSTO	PRIVATE MAIL BAG 1	MENAI	NSW 2234
PASSMORE	DR JR	ROCKWATER PTY LTD	PO BOX 237	SUBIACO	WA 6008
PAUL	MR RJ	C/- WS ATKINS INTERNATIONAL LTD	PO BOX 2985	RUMI 112	OMAN

PEARCE	MR B	QLD WATER RESOURCES COMMISSION	168 FLOCKTON ST	EVERTON PARK	QLD 4053
PECK	DR A	A PECK AND ASSOCIATES	PO BOX 1213	SUBIACO	WA 6008
PEPPER	MR JB	WOODWARD - CLYDE P/L	263 HERBERT ST	DOUBLEVIEW	WA 6018
PERITY	MR CL	STUDENT	1/36 PACIFIC HIGHWAY	ROSEVILLE	NSW 2069
PETTIFER	MR G	DEPT. OF IND. TECH. & RES.	PO BOX 173	EAST MELBOURNE	VIC 3002
PIDSLEY	MR D	POWER AND WATER AUTHORITY	PO BOX 733	HOWARD SPRINGS	NT 0835
PLAISTED	MR GR		10 MONTEREY COURT	KARDINYA	WA 6163
PLEASE	MS PM	AGSO	PO BOX 378	CANBERRA	ACT 2601
POPLAWSKI	DR WA	QLD WATER RESOURCES COMMISSION	GPO BOX 2454	BRISBANE	QLD 4001
POTTS	MR IW	CMPS & F	340 ST KILDA RD	MELBOURNE	VIC 3004
POWER	MR NA	DEPT OF ENVIRON & NAT RESOURCES	68 KESTRAL WAY	MOBBURY HEIGHTS	SA 5092
PRANGLEY	MR CJA		11 BERSICA CRT	KARDINYA	WA 6163
PRATT	MR M	DAMES AND MOORE	20 VICIKI ST	BLACKBURN STH	VIC 3130
PROWSE	MR G	C/- AUSCON	PO BOX 5927	RUMI	OMAN
PUHALOVICH	MR AA	PPK - RUST P/L	97 BROADWAY	NEDLANDS	WA 6009
PURTILL	MR JA	GROUNDWATER TECH AUST P/L	5/31 THOMPSON ST	BOWEN HILLS	QLD 4006
QURESHI	MR H		25 WULAGI CRES	SANDERSON	NT 0812
R-STEFFENS	MS M	DAMES AND MOORE	TAHITI ROAD	TIARO	QLD 4650
RATHUR	DR AQ	CURTIN UNIVERSITY WA	PO BOX U1987	PERTH	WA 6001
RAYNER	MR JL	CSIRO	PRIVATE BAG	PO WEMBLEY	WA 6014
READ	MR R	MINISTRY OF WATER RESOURCES	PO BOX 16427	AL BURAIMI	OMAN
REID	MR M	RURAL WATER CORPORATION	PO BOX 165	TATURA	VIC 3618
RICHARDS	MR GN	HYDRORESOURCES	PO BOX 395	MORLEY	WA 6943
RIHA	MR M	SOLARVAN PTY LTD	25 PURDUM RD	WEMBLEY DOWNS	WA 6019
RITCHIE	DR AIM	ANSTO	22 BORONIA PDE	LUGARNO	NSW 2210
ROBERTSON	MR N		127 CURLEWIS ST	BONDI BERACH	NSW 2026
ROBERTSON	MR MD	GOLDER ASSOCIATES	72 KELVIN GROVE RD	NORMANBY	QLD 4059
ROBINSON	MR KJ	GTA	PO BOX 150	CARLTON SOUTH	VIC 3053
ROBINSON	MR MA	HYDROTECHNOLOGY	75 DAFFODIL RD	BORONIA	VIC 3155
ROSS	MR JB	GROUNDWATER TECHNOLOGY P/L	17A ROPER CRES	SYLVANIA WATERS	NSW 2224
RYAN	MS S	DCNR	5/250 VICTORIA PDE	EAST MELBOURNE	VIC 3002
SALAMA	DR R	CSIRO	PRIVATE BAG	GPO WEMBLEY	WA 6014
SALAS	MR G	C/- GEOLOGICAL SURVEY	PRIVATE MAIL BAG 14	LOBATSE	BOTSWANA
SALOTTI	MR D		12 TUPPER ST	MARRICKVILLE	NSW 2204
SANDERS	MR CC	EPA WA	28 PORTLAND ST	NEDLANDS	WA 6009
SANDERS	MR RA	POWER AND WATER AUTHORITY	PO BOX 1096	DARWIN	NT 0801
SCHAEFFER	MR J	GEO - ENG AUST P/L	PO BOX 42	MORWELL	VIC 3840
SCOTT	MR D	MACKIE MARTIN AND ASSOCIATES	14 EDGEWORTH DAVID AVE	HORNSBY	NSW 2077
SEDDON	MR KD	MPA WILLIAMS & ASSOC P/L	533 NEPEAN HWY	BONBEACH	VIC 3196
SHUGG	MR A	DEPT OF WATER RESOURCES	15 PARK RD	MIDDLE PARK	VIC 3206
SKIDMORE	MR DJP	GSWA	25 FRIMLEY WAY	MORLEY	WA 6062
SMIRK	MR DD		66 ZENOBIA ST	PALMYRA	WA 6157
SMITH	MR IL	PAWA	PO BOX 42355	CASUARINA	NT 0811
SMITH	MR RA	GEOLOGICAL SURVEY OF WA	193 KITCHENER RD	BOORAGOON	WA 6154
SMITH	MR PC	SADME	PO BOX 151	EASTWOOD	SA 5063
SMITH	MR PE	WASTE SOLUTIONS AUST P/L	PO BOX 514	ASHGROVE	QLD 4060
SMOLSKI	MR B	PPK - RUST P/L	6 CHELSEA COURT	CARINDALE HEIGHTS	QLD 4152
SOMARATNE	DR NM		PO BOX 889	MUSCAT 113	OMAN
STADTER	MR MH	SADME	PO BOX 93	NARACOORTE	SA 5271
STEWART	MR G		22 MADDEN ST	BALWYN NORTH	VIC 3104
STREET	MR GJ	WORLD GEOSCIENCE CORPORATION	17 EMERALD TERRACE	WEST PERTH	WA 6005

STRUDWICK	MR D	DEPT OF CONSERVATION & ENVIRON	PO BOX 401	BENDIGO	VIC 3550
SULLIVAN	MR HK	GOLDER ASSOCIATES PTY LTD	161A COPELAND RD	EAST BEECROFT	NSW 2119
TALBOT	MR MJ	DAMES AND MOORE	17/68 GLADSTONE RD	HIGHGATE HILL	QLD 4101
THOMAS	MS DA	GHD	14 McDONALD ST	WILLIAMSTOWN	VIC 3016
THORNE	MR R		34 SIMS ST	SANDRINGHAM	VIC 3191
THORPE	DR PM	GEOLOGICAL SURVEY OF WA	17 HUMMERSTON RD	KALAMUNDA	WA 6076
THROSSELL	MR JS	GROUNDWATER TECHNOLOGY P/L	3 TEAKLE RD	OSBORNE PARK	WA 6017
TICKELL	MR S		PO BOX 2374	DARWIN	NT 0801
TOWNLEY	DR LR	CSIRO DIV OF WATER RESOURCES	PRIVATE BAG	PO WEMBLEY	WA 6014
TUCKER	MR A	AGSO	GPO BOX 378	CANBERRA	ACT 2601
TYSON	MS PL		80 MAIN AVENUE	BARDON	QLD 4065
VERMA	MR M		14 WANDIE CRES	ANULA SANDERSON	NT 0812
VIRTUE	MR RJ	STUDENT QLD UNI OF TECH	7 ASTOLAT ST	DARWIN	QLD 4104
VOGWILL	MR RI	DAMES AND MOORE	85 THE ESPLANADE	YERONGA	QLD 4104
WALKER	MR G		PO BOX 56	SOUTH PERTH	WA 6151
WALKER	MISS S	DJ DOUGLAS AND PARTNERS	31 CREMORNE ST	KOO WEE RUP	VIC 3981
WALL	MR LN	CHINA-AUSTRALIA MINEWASTE PROJ	C/-BGRIMM 1 WENXING ST	RICHMOND	VIC 3121
WALLIS	MR RB	ROCKWATER P/L	8/98 TYLER ST	XIZHIMEN WAI	BEIJING
WATERHOUSE	MR J	AGSWA	3 CHADD PLACE	JOONDANNA	WA 6060
WEAVER	MS TR	GOLDER ASSOCIATES	25 BURWOOD RD	WEMBLEY DOWNS	WA 6019
WEBB	MRS ST	DEPT OF WATER RESOURCES	PO BOX 10	HAWTHORN	VIC 3122
WEEKS	MR WD	KINHILL CAMERON McNAMARA	7 CARAWATHA ST	WAGGA WAGGA	NSW 2650
WHARTON	MR PH	ROCKWATER PTY LTD	PO BOX 237	EVERTON PARK	QLD 4053
WHINCUP	MR P	DAMES AND MOORE	15-17 CHURCH ST	SUBIACO	WA 6008
WILLGOOSE	DR GR	DEPT CIVIL ENG AND SURVEY	UNI OF NEWCASTLE	TWICKENHAM UK	TW1 3NQ
WILLIAMS	MR RM	DEPT OF WATER RESOURCES	PO BOX 3720	CALLAHAN	NSW 2308
WILLIAMSON	MR DR	NSW		PARRAMATTA	NSW 2124
WILLIAMSON	DR RJ	CSIRO	PRIVATE BAG	PO WEMBLEY	WA 6014
WILSON	MR VC	DEPT CONS AND NAT RESOURCES	15 PENDER ST	THORNBURY	VIC 3071
WISCHUSEN	MR JD	CURTIN UNIVERSITY	45 PORTCULLIS DR	WILLETTON	WA 6155
WOOLDRIDGE	MR DJ	C/- COODE BLIZARD	PO BOX 8240	ALICE SPRINGS	NT 0871
WOOLLEY	MR DR	DEPT OF WATER RESOURCES	3 BARWON AVE	PURLEY	SURREY
YIN FOO	MR D	NSW		TURRAMURRA	NSW 2074
YU	MR X	POWER AND WATER AUTHORITY	PO BOX 3231	DARWIN	NT 0801
ZAAR	MS U	PHD STUDENT UNSW	DEPT APPLIED GEOLOGY	PO BOX 1	NSW 2033
		NSW	UNSW	KINGTON	
		POWER AND WATER AUTHORITY	15 CLEMATIS ST	NIGHTCLIFF	NT 0810

IAH EXECUTIVE ELECTION

The National Executive wish to advise the membership of IAH Australian Chapter that the Executive received only one formal bid by the agreed deadline for the running of the next National Committee. This bid came from Queensland. There is thus no need for the election and Queensland are deemed to be the Executive of IAH Australian Chapter from November 24, 1994 for 4 years.

Congratulations Queensland!

Michael J. Knight

President IAH Committe.

QUEENSLAND BRANCH BID FOR THE NATIONAL COMMITTEE

The Queensland Branch of the IAH is one of the most active in Australia. It currently has fifty-two financial members consisting of :- Consultants (27), Government (18), Tertiary Institutions (3), and Students (4). These members have expertise covering all fields of hydrogeology.

Queensland Branch meetings are held every two months and focus on current issues and technology in hydrogeology. The current committee has worked hard at obtaining the correct balance at meetings to ensure professionals at all levels and students increase their understanding of hydrogeology and improve communications with other members in their association.

The Queensland Branch believes that it has the expertise and enthusiasm to run the National Executive for the next four years. If elected it proposes to:-

- Work towards better communications between states and improve information transfer.
- Become more proactive in promoting hydrogeology and increasing the community awareness of groundwater.
- Establish interaction with other bodies, including AWWA, GSA, I E Aust, AIDA, and APESA.
- Interact with existing IAH members (and promote IAH) in Southeast Asian and Pacific areas.

PROPOSED EXECUTIVE

PRESIDENT **John Hillier - Manager, Groundwater Assessment Group, Department of Primary Industries (DPI) Water Resources.**

VICE-PRESIDENT **Ian Hair - Senior Hydrogeologist, Woodward Clyde.**

SECRETARY **Robert Ellis - Senior Hydrologist, Groundwater Assessment Group, DPI Water Resources.**

TREASURER **Peter Evans - Hydrologist, Groundwater Assessment Group, DPI Water Resources.**

EDITOR **Malcolm Cox - Lecturer, School of Geology, Queensland University of Technology.**

ASST.-EDITOR **Magdalena Steffens - Manager, Environmental Groundwater Consultants Pty. Ltd.**

COMMITTEE **John Harman - Principal Groundwater Engineer, Rust PPK.**

Paul Smith - Managing Director and Principal Consultant, Waste Solutions Australia Pty. Ltd.

Colin Laing - (Foundation Member of Australian IAH), ACM Laing and Associates.

Lindsay Furness - Senior Hydrogeologist, DJ Douglas and Partners.

Bruce Pearce - Senior Hydrologist, Survey Group, DPI Water Resources.

WATER DOWN UNDER, ADELAIDE, NOVEMBER 21-25 1994.

All members are strongly urged to support this, the first IAH Congress to be held in Australia (and probably the last for some time). So far registrations have been steady with only 150 to go before the budgeted attendance of 500 is achieved. 'Corporate' registrations are available whereby two or more people can alternate attendance at the technical sessions only.

Registration as soon as possible would be appreciated, especially with the details of workshops and tours required to enable effective planning to be carried out. Remember, the IAH Dinner is part of the registration fee! There are 250 auditorium papers, almost 100 poster papers and 18 workshops for your interest and edification, together with 30 exhibition stands. The mid - Conference tours are good value, incorporating wonderful scenery, water and wine at dinners at the end of each tour.

Be there! Any queries should be directed to

Peter Dillon 08 303 8714
Steve Barnett 08 274 7583

Item for IAH NEWSLETTER

I was recently asked to be an Associate Editor of 'Applied Hydrogeology', the Association's quarterly scientific journal.

I am interested in seeing more Australian and Southeast Asian papers in this international forum and would be happy to advise prospective authors. Having done some national compilation jobs I am conscious that a lot of really good Australian hydrogeological work is buried in the grey literature (unpublished departmental reports, theses, consulting reports). If anyone wants help in sorting out possible manuscripts for publication please contact me at AGSO, Box 378, Canberra, 2601 (phone 062-499758, fax 062-499970).

Gerry Jacobson



GROUNDWATER CENTRE

POSTGRADUATE PROGRAMMES IN GROUNDWATER STUDIES - 1995

Groundwater Studies programmes will be offered as a specialisation in the Master of Engineering Science (M.Eng.Sci.) and Master of Applied Science (M.App.Sci.) by coursework programmes at The University of New South Wales in 1995.

The degree programmes comprise 21 credits from seven selected subjects and a 9 credit project. The programmes can be taken on a full-time (2 Sessions) or part-time (4 Sessions) basis.

Introductory Session I subjects are selected from the list below. The exact subject choice will depend upon the degree programme selected. The course of study must be approved by the Head of School or the Head's nominee.

Introductory Subjects:

GEOL9051 Hydrogeochemistry; CIVL9081 Groundwater Contamination and Remediation; CIVL8975 Hydrological Processes; GEOL9010 Groundwater Environments; CIVL9860 Investigation of Groundwater Resources.

Advanced Electives:

CIVL9880 Groundwater Modelling; CIVL9861 Environmental and Engineering Geophysics; CIVL9880 Decision Support Systems in Hydrology; GEOL9052 Advanced Hydrogeochemistry; CIVL9799 Environmental Geomechanics; GEOL9070 Engineering Geophysics; GEOL9100 Remote Sensing of Groundwater Resources.

UNSW staff taking part in the teaching programme outlined above include:

Dr R.I. Acworth (*Dept. Water Engineering*) - Groundwater Resources & Contamination
A/Prof N. Ashbolt (*Dept. Water Engineering*) - Microbiological Studies
Dr D Cohen (*Dept. Applied Geology*) - Environmental Auditing, Health & Safety Aspects
A/Prof R. Cox (*Dept. Water Engineering*) - Groundwater Modelling
Dr D Djokic (*Dept. Water Engineering*) - Remote Sensing, GIS and Data Base Use
Dr N. Khalil (*Dept. Geotechnical Engineering*) - Groundwater Modelling
Dr D Palmer (*Dept. Applied Geology*) - Engineering Geophysics
Dr J. Jankowski (*Dept. Applied Geology*) - Hydrogeochemistry, Groundwater Environments
Dr G Swarbrick (*Dept. Geotechnical Engineering*) - Environmental Geomechanics
A/Prof G.R. Taylor (*Head, School of Mines*) - Remote Sensing Studies
Prof D. Walte (*Head, Dept. Water Engineering*) - Environmental Geochemistry

The project will be supervised by one of the above staff. Limited scholarships may be available to support project work. Extensive research and teaching facilities are available in the three Departments and at The Water Research Laboratory. These include networked workstation and PC laboratories, Chemical Laboratories (including GC-MS), and a wide range of field equipment.

Applications or expressions of interest may be directed to Dr. Ian Acworth, Director, UNSW Groundwater Centre, Water Research Laboratory, King Street, MANLY VALE 2093, Australia. Tel (02-949-4488) Fax (02-949-4188), email acworth@manly.civeng.unsw.edu.au. The closing date for applications will be the end of October, 1995.

SA NEWS

• **Great Artesian Basin Hydrogeological Assessment**

In response to potential additional mining development in the State's Far North, a review of the groundwater resources along the southwestern margin of the GAB has commenced. The program essentially involves the compilation of all available hydrogeological data into a comprehensive database and computer modelling to predict the likely impact of additional water withdrawals on the more environmentally sensitive areas.

• **Upper South East Dryland Salinisation**

Large areas of land in the Upper South East have been degraded by salinisation caused essentially by high and rising groundwater levels. After a lengthy public consultation process, a supplement to the management plan and draft EIS has been completed. A key component of the plan is a regional coordinated groundwater drainage scheme, with discharge of excess surface water and groundwater to the sea and possibly the Coorong.

• **Stormwater Aquifer Recharge**

The inground storage of wetland treated stormwater using recharge wells is currently being trialled at 4 sites in the Adelaide region. These are collaborative projects with local government and authorities who plan to reuse the water for irrigation purposes. One of the objectives of these trials is the formulation of irrigation water quality guidelines. Results to date are very positive.

• **Water for Aboriginal Communities**

MESA provides ongoing professional assistance to the Pitjantjatjara Council in the selection of water supply well sites in the Far Northwest homelands. In conjunction with the State's Department of Aboriginal Affairs, automatic recorders are being installed in Aboriginal community water supply wells to monitor groundwater withdrawals and the corresponding water level drawdowns. MESA has also been requested to assess the possibility of additional groundwater development in communities with water supply shortages.

• **Groundwater Irrigation Areas**

Management plans have been revised or are under development in a number of groundwater irrigation areas which are experiencing lowered potentiometric levels and/or increased salinity levels. The approach taken in community consultation plays a crucial role in community acceptance of the plans. Plans developed by peak, community based advisory groups without extensive consultation during the course of plans' development have experienced significant community resistance. Where intensive efforts have been put into this consultative process, the plans have been accepted.

An issue common to a number of groundwater irrigation areas is resource degradation due to leaking wells i.e. saline groundwater contamination through corroded casing or well annulus. The impact of leaking wells is currently being assessed for the North Adelaide Plains and Barossa Valley irrigation areas. One of the related issues is funding sources for any rehabilitation program.

- **Guidelines for Landspreading of Agricultural Wastewater**

Water Resources Group in the Department of Environment and Natural Resources commissioned the Centre for Groundwater Studies to develop guidelines for landspreading of agricultural wastewaters in the South East of South Australia. The Centre has provided draft guidelines for comment. The region is underlain by a unconfined Tertiary Limestone aquifer which is vulnerable to point source pollution. Landspreading of agricultural wastewaters from piggeries, dairies, cheese factories, abattoirs and saleyards is practised as a disposal technique. This has resulted in instances of high nitrates and increased salinity levels in some areas mainly due to poor spreading practices by land holders. The guidelines will form the basis for performance - based licensing for landspreading of waste waters.

- **Atrazine Occurrence in Groundwater in SA**

Ciba-Geigy Australia Ltd initiated a joint study in SA into the occurrence of atrazine in groundwater. Partners in the study were SA Department of Mines and Energy, Engineering and Water Supply Department and the Centre for Groundwater Studies. The study was undertaken in two stages, the first stage involving collation of data on use of atrazine and existing groundwater quality data where atrazine had been analysed. The second stage involved investigating two different land uses where atrazine had been used, irrigated cropping and softwood plantations.

Site selection was based on information on localities of fields and forests where use of the herbicide was known, and by avoiding sites with deep water tables. That is site selection favoured locations where aquifers are vulnerable to contamination. Two bores were drilled at each site to sample groundwater at the watertable. Atrazine was detected in concentrations from 0.3 to 2.0 ug/l at three of four sites in irrigated agriculture where atrazine was used for up to ten years to suppress weeds in irrigation channels. The highest concentrations coincided with the site with the heaviest application rate over the longest period. Also this was the only site at which the metabolite desethylatrazine (0.3 ug/l) was detected. Simazine was found at two other irrigated sites (0.15 to 0.23 ug/l). In pine forests atrazine was detected at one of four sites (0.16 to 0.75 ug/l) where it is used in the establishment of new plantings. At each site where atrazine (or desethylatrazine) was detected it was found in samples from both bores.

- **Contamination of Groundwater by Pulp and Paper Mill Effluent in SA**

Pulp and paper mills have operated in the South East of SA since the 1940s. Effluent is discharged to a coastal lake via unlined drains up to 11 km in length. The shallow groundwater in a Tertiary limestone aquifer has been impacted by the effluent at one particular site where the watertable is below the base of the drain for most of the year. This site was investigated in detail by the Engineering and Water Supply Department and the Department of Mines and Energy from 1990-1992. Only the top 10 m of the 150 m aquifer sequence had been impacted. High levels of organochlorine and other organic compounds typical of pulp mill effluent were found in a plume up to 1 km long adjacent to the drain.

The mill discharging to this drain has undertaken a major redevelopment including effluent recycling and treatment which has resulted in an effluent that meets the guidelines set by the SA Government for this activity. The beneficial use of the groundwater has not been affected due to the stratification of the plume and therefore it was decided that active remediation of the plume is not required.

- **Potential for Groundwater Salinisation : Mallee Region, Murray Basin. LWRDC funded project CWS3 CSIRO/MESA/DENR**

Large scale clearing of Mallee vegetation in the Murray Basin has resulted in a dramatic increase in recharge rates from less than 1mm/year up to 100 mm/yr. The Mallee region contains a large area (~1500 km²) of fresh groundwater (<1500 mg/l) which is used for townwater supplies and irrigation. The unsaturated zone contains saline soil water(20-30 000 mg/l) which will be displaced into the aquifer due to the new increased recharge rates. The aim is to determine if there is already a measurable impact on the resource and to develop models to predict the time frame for groundwater salinisation. An important aspect is to determine the extent of mixing within the aquifer so that we can predict changes in salinity at various depths in the aquifer. The results will be used by the Mallee Water Resource Committee to ensure long term management of the resource.

- **Sustainable Development of the Confined Dilwyn Aquifer of the Otway Basin**

Radiocarbon and stable isotope data indicate that groundwaters in the Kingston-Robe artesian district are palaeowaters recharged during the last glacial period. Modelling of the aquifer system indicates that at this time recharge to the confined aquifer occurred over a larger area with a potentially greater flux. Today active recharge has contracted to a relatively small zone between the hydraulic hinge line and the Kanawinka Fault. Groundwater both above and below the confined aquifer is more saline. Overuse of the resource has the potential for increased salinisation of the groundwater. For sustainable development of the resource the amount of recharge entering the system needs to be determined. A number of cores have been taken through the confining bed and analysed for permeability, stable isotopes and major ions to estimate recharge to the confined system. To date two papers in the Journal of Hydrology have been published.

WESTERN AUSTRALIAN BRANCH NEWS

1994/5 COMMITTEE

Chairman	Ron Colman
Vice Chairman	John Waterhouse
Secretary	Gary Meyer
Meetings Secretary	Len Baddock

MEETINGS

27 June 1994 Annual General Meeting

Phil Wharton: Rockwater

Applications of Modflow in mine dewatering, borefield assessment, and infiltration from dams.

1 August 1994

Greg Street: World Geoscience Corporation

Groundwater exploration using high resolution airborne geophysics in the Indian State of Orissa

5 September 1994

**John Waterhouse, Hazli Koombri, Richard Nixon, Chad Pranglely:
Geological Survey of Western Australia:**

1993/4 Groundwater exploration initiative

RICHARD BARNES BURSARY

The Richard Barnes bursary for an honours student undertaking a hydrogeological project has been awarded this year to

Toby Whincup

Previous recipients of the award were:

1992	Sara Cody
1993	Sam Burton

WESTERN AUSTRALIA

Groundwater Exploration in W.A.

The W.A. government has provided \$500,000 to the Geological Survey of W.A. for a "Groundwater Exploration Initiative" (GEI) program, with the objective of carrying out baseline groundwater resource assessment. Study areas are selected where there is potential for location of fresh groundwater resources or where there is significant potential demand for groundwater supplies, and in support of ongoing hydrogeological mapping programs. The program is being managed by John Waterhouse who was recruited for the purpose, and is being carried out by a team of contract hydrogeologists supervising private drilling contractors.

The GEI budget has been supplemented by the Water Authority of Western Australia, regional development commissions and as land-care groups.

The 1993-94 program was carried out between December 1993 and July 1994. The twelve project areas represent a wide range of hydrogeological environments, located in many parts of W.A., from the south coast, (Albany and Esperance) to the Ord River Irrigation area in the far north of the state.

Low salinity groundwater was identified in seven study areas. Of particular interest was an occurrence of low salinity groundwater in a Tertiary palaeochannel in a predominantly brackish to saline environment in south west WA. In addition, geological and hydrogeological data were provided to support two 1:250,000 hydrogeological maps (Albany and Esperance) and to complete data collection in the Geraldton area for a major publication on the hydrogeology of the Perth Basin.

A major program in the far north of the state is being carried out near Kununurra, to assist with planning extensions to the Ord River Irrigation area. This involves identifying groundwater conditions beneath future irrigation areas and exploring for gravel aquifers which may be suitable for irrigation prior to construction of feeder canals from the main irrigation system. The work is being coordinated with a similar program being undertaken in the adjacent part of the Northern Territory by the Power and Water Authority.

International Association of Hydrogeologists Victorian Contribution

August Report

1. Victorian Branch Activities

Meetings

June 7 Salt Action - Joint Action - Innovation and Challenge - Graham David, Salinity Bureau.

August 3 A day in the life of a Hydrogeologist. Student evening - John Leonard, Greg Hoxley, Paul Bolger, Anthony Lane, David Ife.

2. Some Projects of Interest.

Hydrotechnology has, in recent years, been contracted by the State Government to undertake several regional groundwater investigations throughout the south-western region of Victoria. These investigations have concentrated on assessing the potential of groundwater utilisation for town water supply purposes. However, more recently some investigations have been directed towards emerging salinization problems.

Investigations have shown that the groundwater resources in the southern portion of the region are extensive and appear to have potential to provide large volumes of potable water. The major fresh water aquifers occur in the basal Tertiary sand and gravel units which underlie the southern half of south-western Victoria and outcrop along the flanks of the Otway Ranges and Merino High.

Long term aquifer testing combined with groundwater monitoring and modelling have been undertaken by the Geelong and District Water Board and HydroTechnology in the Barwon Downs and Curdie Vale areas respectively, in an effort to assess the long term sustainability of the aquifer systems to augment the Cities of Geelong and Warrambool. Preliminary investigations have identified substantial storages of good quality groundwater in the Kawarren, Moorabool and Anglesea areas flanking the Otway Ranges and the Portland - Port Fairy region which receives recharge via infiltration into the outcropping based sands flanking the Merino High.

Air-lift Pumping

Groundwater pumping for watertable control and salt interception adjacent to rivers continues to be used as an effective salinity control option. Airlift pumping is presently enjoying an increase in popularity due to its potential to eliminate high capital costs, particularly where power is remote from the pumping site, and to reduce maintenance problems in corrosive and erosive groundwater environments.

Single compressors can be used to pump from multiple bores, with individual controls for air, discharge and hence drawdown. HydroTechnology is currently involved in several investigation and construction projects using air-lift pumping technology.

The Underground Sea

The Groundwater Section of HydroTechnology offers a groundwater advisory service to consultants and the general public.

Not all inquiries are as simple as others. One recent inquiry requested data on every bore in Australia, with the view to establishing various inland shipping channels which could be excavated into the 'underground sea'. The enquirer modified the request to data on all bores in Victoria. Evidently, the enquirer's desire was to swim the underground sea from the Murray River to the coast.

When advised that his concept of the underground sea was incorrect, and that in reality 'aquifers' existed where water flowed around sediment grains or through fractures in the rock, the enquirer requested information on methods of excavating the sand so that an underground passage would be left that would allow free swimming. Presumably the location of the bores was required in order that air supplies from the surface could be renewed. (Reproduced from Flowlines).

Latrobe Valley Dewatering

Geo-Eng Australia Pty Ltd are involved in the day-to-day management of the aquifer depressurisation program for Generation Victoria's brown coal open cut mines in the Latrobe Valley. At present 25,000 Ml of water is extracted from the aquifers beneath the Morwell Mine each year to supply 12 Mt of coal to Hazelwood Power Station. This represents the extraction of twice as much water as brown coal. Depressurisation of the sub-coal aquifers is also required at the Loy Yang and Yallourn Eastfield mines.

At Morwell Mine, Geo-Eng is working closely with the mine personnel to reduce the cost of water extraction by using computer modelling to optimise the location and number of pumps required. The quantity of water extracted has been progressively reduced as modelling shows that the target aquifer pressures required can be raised without compromising mine stability.

At Loy Yang Mine, depressurisation of the aquifers has been complicated by leakage from a large settling pond located less than 800m from the edge of the mine. Following drilling, geophysical and geochemical investigations it was found that water was leaking via a joint within coal exposed in the base of the pond. The pond has subsequently been drained and lined and aquifer pressures within the mine have declined as a result.

New South Wales IAH Branch News

IAH Meetings

Mr Chris Kidd from Woodward-Clyde Australia Pty Ltd addressed the bi-monthly professional meeting in July. Chris gave an interesting talk on the Stage 1 investigations at the ICI site in Botany. The subject matter was very topical as the Botany sands aquifer is arguably the most polluted in Australia. We look forward to hearing from Chris again when the clean up phase gets going.

Approximately 30 people attended the meeting.

The remaining meetings and speakers for the year are:

- 22 September Tom Robinson, Rust-PPK
(experiences in groundwater pollution in the USA)
- 10 November Andrew Skinner, Secretary IAH, Kenilworth, UK
(Overview of Groundwater Management and Protection in Europe)

Meetings start at 5.30 PM for 6.00 PM and talks last for about an hour.

It's not often that we have a member of the IAH executive in Australia so after Dr. Skinner's talk on the 10th November all members are invited to come to dinner at a nearby venue (yet to be decided). It will be our last meeting for the year and this social get-together will be in lieu of our annual Christmas function. Please make an effort to come.

Career Moves

Messrs David Salotti, Peter Sinclair John Bradd have joined the Hydrogeological Unit of the DWR in Parramatta.

Ms Jennifer Anderson joins Groundwater Technology in Western Australia from DWR in NSW.

Paul Donnelly has joined the Department of Planning in their Sydney office

Consultants Talk

Rust-PPK

Rust-PPK plans to increase its operations by 30% during 1994 with a corresponding increase in its workforce. The firm, formerly PPK Consultants, has adopted the name of its American parent RUST in line with its intention of extending the range of environmental and infrastructure services overseas.

The firm purchased Mackie Martin - a team of groundwater engineers and scientists in 1993.

Groundwater Technology

Groundwater Technology is running a series of seminars across Australia and New Zealand in August/September 1994. Titled 'On-site soil and groundwater remediation' the one day seminar is great value at only \$140. The short course focuses on solutions, regulations, management decision tools and remediation techniques for the chemical, manufacturing and petroleum industries.

Environmental and Earth Sciences

The firm was first established in 1983 as a group of independent consultants to devise scientific based solutions for surface/groundwater and environment waste management projects with a strong association with the mining industry.

Staff are highly specialised in earth science fields of hydrogeology, geology, soil science, hydrochemistry and geophysics.

Philip Mulvey is the Managing director and Principal Soil Scientist of Environmental and Earth Sciences. He has 13 years experience in contaminant hydrogeology involving mining, industrial and domestic studies.

CRC WASTE MANAGEMENT AND POLLUTION CONTROL

Project 3.1 - INTEGRATED MAPPING TECHNOLOGIES

Site contamination from past industrial use may be the 'sleeping giant' of waste management and pollution control. No-one knows for sure how many parcels of seriously polluted land there are, but if experience with the huge Superfund Program in the USA is any guide, millions must exist world-wide, and Australian numbers will be in the hundreds at least.

Some of these sites are the result of permitted activity, such as the burying of toxic wastes in times past when regulations were lax and poorly enforced. Others were contaminated in ignorance through the routine operation of industrial plant which produced hazardous wastes about which no-one knew or cared at the time.

Many such sites lie within our big cities, often on prime pieces of real estate now in demand for redevelopment for residential or recreational use. They have to be cleaned up first. Leaching of pollutants from other sites, often still in use, has contaminated the groundwater, spreading pollution far beyond river boundaries.

The Cooperative Research Centre for Waste Management and Pollution Control, with the Integrated Mapping Technologies Project (IMT), is looking at the question of just what lies buried, sometimes at considerable depth. The issue is tougher when the pollutants are liquids rather than easier to detect solid objects like drums and tanks. Project 3.1 of the CRC involves the use of a number of different measurement and sensing technologies that can be combined to produce a superior image of the three dimensional distribution of contamination beneath the surface. There are a number of ways to probe the ground, from chemical analysis of samples from multiple piezometers, through measurement of electrical conductivity or magnetism, to the use of down-hole neutron or electromagnetic probes.

The IMT project team want to put the most appropriate of these together in a product that delivers the most relevant information in the most cost-effective manner. The question of cost is an important one, since at the present time, the reliable assessment of contaminated sites can be very expensive, and the owners of many sites cannot or will not pay. The focus of the project has been tightened even further by the decision to concentrate on the detection of liquid phase contamination by chlorinated hydrocarbons, the notorious dense nonaqueous phase liquids (DNAPL's). The world-wide market survey undertaken at the start of the project indicated that a method of finding such pollutants at depths greater than 5m was the most urgent need, and therefore the most saleable product.

The project team is led by ADI's Tim Pippett and Ian Acworth from UNSW and includes resources from the Water Board, the UNSW, Brambles, ADI, BHP, ICI, CSIRO Division of Water Resources and Division of Exploration Geosciences, NSW EPA and ANSTO. The main centre of activity for the IMT project is at the Water Research Laboratory in Manly Vale, where new offices have been established and equipped for the project. A spe-

cialised geophysical and geochemical laboratory incorporating GC MS and complex electrical conductivity measuring equipment has been installed to be operated by a full time staff of 5. Considerable effort has been expended in the development of drilling and sampling techniques to recover minimally disturbed samples of the contaminated sands. Core lengths have now been recovered in 1100mm lengths which contain the target contaminants.

A site in Sydney has been selected for investigation and detailed testing of methods is now underway. Like all CRC projects, this one has a strong emphasis on commercial outcomes. Once the project is complete, around December 1996 at a cost of \$3.4 million, a prototype IMT system for assessing contaminated sites and for monitoring the progress of in situ efforts at remediation will be available as a service to industry. Other avenues for commercialisation of the IMT system are being evaluated. CRC partners contaminated sites will be able to use the service, and the whole concept can be extended to other types of contamination once the prototype system is established as a reliable environmental tool.

Prepared by Ian Acworth (UNSW) and Tim Pippett (ADI)

**POST GRADUATE COURSES
IN GROUNDWATER MANAGEMENT**



University of Technology, Sydney

THE NATIONAL CENTRE FOR GROUNDWATER MANAGEMENT

THE NATIONAL CENTRE FOR GROUNDWATER MANAGEMENT (NCGM) at the University of Technology, Sydney is recognised by the Federal Government through the Land and Water Resources Research and Development Corporation as a National Centre for Training, Research and Consultancy in Groundwater and Environmental Applications.

A range of postgraduate programs is being offered currently:

Master of Science (Research and Coursework) and Ph.D.; Master of Engineering – Course Work and Research degrees); Graduate Diplomas (Science or Engineering); Graduate Course (15 weeks) Coursework Degrees are 1 year Full-time or Part-time mode and other possibilities available.

Coursework topics covered include: Hydrogeology, Groundwater Modelling, Hydrogeochemistry, Surface Hydrology and Groundwater, Geopollution Management, Contaminated Site Management, Groundwater Geophysics and Remote Sensing of Groundwater Resources, Computing for Groundwater Specialising.

Study areas include:

Groundwater Contaminant Transport Modelling; Quality and Quantity Optimisation Strategies for Water Resource Development; Waste Management and Groundwater; Contaminated Land Evaluation and Rehabilitation, Biodegradation of Chlorinated Hydrocarbons; Practical Areas of Hydrogeology including Geophysics, Hydrochemistry and Microbiology aspects; Bore Fouling and Maintenance; Land and Groundwater Salinity.

Associate Professor Michael J. Knight (Director)

Contaminated Sites; Chlorinated hydrocarbons (DNAPL) contamination in soil and groundwater; (LNAPL) interactions with DNAPLs; Design of Safe Land Based Waste Management Systems

Mr Noel P. Merrick, Senior Lecturer in Groundwater Modelling

Groundwater Modelling; Optimisation techniques (technical and economic coupling); Groundwater geophysics applications to mapping contaminant plumes

Ms. Kayleen Walsh, Environmental Microbiologist

Biodegradation of Chlorinated Hydrocarbons and Pesticides.

Dr. William A. Milne-Home, Senior Lecturer in Hydrogeology

Flow and Solute movement (pesticides) in the unsaturated zone; Dry land salinity and its management

Dr. Robert G. McLaughlan,

Research Fellow in Contaminant Hydrogeology;

Adsorption/Desorption Processes for Chlorinated hydrocarbons; Risk assessment/legal issues and auditing of contaminated sites; Fouling/corrosion of groundwater bores and pipes.

Mr. Rungruang Lertsirivorakul, Hydrogeologist

Salinity, groundwater relationship, tree water use, salinity origins, modelling.

Graduation Rate and Employment

In 1994, 16 candidates have graduated with the majority gaining employment within a short time of gaining their qualifications.

For Application and Information contact:
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OF THE
INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS
HOSTS IN EDMONTON ALBERTA:**



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