

## Personal Details

<b>Nationality:</b>	British	
<b>Date of Birth:</b>	28th January, 1958	
<b>Marital Status:</b>	Married with 2 children.	
<b>Email:</b>	<a href="mailto:jma@hydrogeologist.net">jma@hydrogeologist.net</a>	
<b>Website</b>	<a href="http://www.hydrogeologist.net">www.hydrogeologist.net</a>	

## Key Qualifications

Specialises in water resource assessment, development and management projects. Has experience in quantifying water resources and use, making river basin management plans, assessing water quality and contamination, GIS, groundwater modelling, drilling and pumping test supervision, geophysics, writing preliminary, feasibility and final reports, making proposals, and preparing tender documents and evaluations. He has been a Team Leader and Technical Advisor for a number of projects and has experience in Afghanistan, Botswana, Canada, Kosovo, Nigeria, Oman, Pakistan, the UK and the USA.

## Education and Professional Status

M.Sc., Hydrogeology, University of London, 1982.  
Diploma Hydrogeology, University College London, 1982.  
B.Sc. (2:1 Hons.), Environmental Science, Plymouth Polytechnic, 1980.  
Fellow of the Geological Society.  
Member of the International Association of Hydrogeologists.

## Summary of Achievements

Mr. Ashworth's achievements include:

- In Botswana, directed projects to bring fresh water to villages and towns located on the edge of the Kalahari Desert and the Okavango Delta.
- In California, helped assess the impact of hydrocarbon spills and wrote proposals on groundwater/ecosystem vulnerability to MTBE and endocrine disrupters.
- In Canada, assessed the environmental impact of oil field activities on groundwater quality. Conducted groundwater investigations and pumping tests to help develop sources of water for the oil industry in Fort McMurray.
- In England, helped evaluate the environmental liabilities of 37 landfill sites belonging to Biffa. Instigated the development of the first reticulated water supplies on St Agnes and identified a number of contaminants that pose a risk to the Isles of Scilly's groundwater supplies.
- In Oman, was a Technical Advisor to the DG of Water Resources Assessment. Led the project teams that identified and quantified the two largest reserves of groundwater resources in the country. Developed a useful technique to help quantify the amount and variability of recharge. Contributed to a methodology to evaluate the effectiveness of artificial recharge schemes. Ran the Hydrogeological Section of Mott MacDonald International and helped develop the company's groundwater business.
- In Nigeria, participated in the development of the combined EM/ Resistivity method of siting boreholes in hardrock areas and helped bring water to 1000 villages.
- In Pakistan, participated in the identification of the monitoring requirements needed to investigate the interface between fresh & brackish groundwaters.
- In Scotland, participated in the development of additional water supplies for Fort William and improvements in the River Spey's water quality.

These accomplishments are described in detail in the ***Experience Record*** that follows:

## Experience Record

### **1999 - Present Freelance Water Resources Specialist & Hydrogeologist**

#### **GFA, Kosovo**

Since March 2009 he has been working for GFA on an EU-funded river basin management project. This project is providing institutional support to the Ministry of Environment and Spatial Planning (MESP), and River Basin Authorities in Kosovo. His task is to help implement the EU Water Framework Directive's (WFD) rules and procedures for groundwater in Drini River Basin. Main responsibilities included the delineation and characterisation of groundwater bodies, the execution of plans for creating a monitoring network (for groundwater levels and water quality), and the introduction of procedures and tools to characterize the quantitative and chemical status of groundwater. These activities were aided by training programs and a groundwater pilot project.



#### **Geo Resources Consultancy, Oman**

Between June 2007 and May 2008 he worked for GRC, on behalf of the Ministry of Regional Municipalities and Water Resources (MRMWR), on a project designed to investigate groundwater resources for irrigated agriculture and settlements in Tertiary to Cambrian aged aquifers in the Dhofar Governorate. He was employed to interpret existing hydrological and hydrogeological information and new data collected during the drilling, testing and sampling of 90 project boreholes, to collate these data onto GIS databases and write a report detailing the water balance, water quality and groundwater resources of Dhofar.

Interesting technologies employed on this project included the analysis of  $^{14}\text{C}$ , oxygen ( $^{16}\text{O}/^{18}\text{O}$ ), deuterium ( $^2\text{H}$ ) and strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) isotope data. The reporting for this project was finalized in July 2008.



#### **BCEOM, Oman**

Intermittently between November 2006 and May 2007 he worked for BCEOM on a project designed to investigate the feasibility of abstracting large volumes ( $9000 \text{ m}^3/\text{hr}$ ) of groundwater from beach wells for a desalination plant located in Sur. This project was funded by Veolia Water. His responsibilities included the preparation of specifications and contract documents for drilling and testing these wells. He selected contractors, liaised with government agencies, implementing the award of these contracts, and assisting BCEOM in the investigation, testing and development of these resources.



#### **Geo Resources Consultancy, Oman**

Between September 2005 and August 2006, he worked on three exploration drilling and aquifer testing projects in Northern Oman for GRC on behalf of MRMEWR. The main objectives of these Projects were to evaluate the extent of brackish and fresh groundwater resources in the Massarat, Batinah and Musandam Regions of Oman with a view to using this water for agriculture and town water supplies. Mr Ashworth collated existing borehole data, Landsat ETM images, DTEM data, geological and structural information and data from surface geophysics (TDEM) onto a GIS database and identified exploration areas. Mr Ashworth's

other responsibilities included: providing borehole designs; supervising the collection, collation, analysis, interpretation and reporting of all drilling and testing data; liaison and supervision of the MRMEWR field teams, technical and professional personnel; training of personnel; and preparation of Final Reports describing Project objectives, activities, all hydrogeological analyses and interpretations, quantifying resources, and identifying potential wellfield areas and sustainable yields.



#### **PCI Asia, Afghanistan**

In July and August 2005, Mr Ashworth visited Mazar-e Sharif and made a preliminary assessment of the groundwater resources in the lower sections of the Balkh and Khulm watersheds for an ADB Emergency

Infrastructure, Rehabilitation and Reconstruction Project. Existing borehole data (water levels and water quality) were collated onto GIS-linked databases, historic hand-drawn USSR maps were geo-referenced and the hydrogeology of the area was reviewed and examined with the aid of GIS generated maps. Plans, tender documents and cost estimates were then prepared for a well inventory, a surface geophysical survey (resistivity imaging and TDEM soundings) and a drilling and aquifer testing program.

**Geo Resources Consultancy, Oman**

Between August 2003 and June 2005, he provided hydrogeological advice for a groundwater exploration project in the Rub al Khali Desert, in Oman. The main objectives of this project were to delineate and quantify fresh and useable brackish water resources, and determine locations for potential wellfields. Drilling targets were aquifers located in the Tertiary-aged Dammam, Rus and Umm er Radhuma Formations (UER). Overflowing artesian conditions (e.g. 92 L/sec at 4 bar) in the UER provided challenging drilling conditions. Formations, aquifers and thief zones were identified with the aid of foraminifera, lithological descriptions and downhole geophysics. Non-target aquifers and thief zones were cemented off with multiple steel casings to avoid run-away flows, head and flow losses, and deterioration of water quality.



**Water Resources Consultants, Botswana**

Between April 2001 and August 2003, he was the Team Leader of the Maun Groundwater Development Project (Phase 2). The goal of this Project was to develop production wellfields capable of meeting the year 2015 projected water demand, of 5 Mm<sup>3</sup>/yr, for the town of Maun and associated localities. The Project entailed exploration, quantification and development of groundwater resources in the lower Okavango Delta (2,500 km<sup>2</sup>). Responsibilities included provision of technical advice, team management (29 staff), client liaison, reporting, logistics, procurement, Project expenditure, billing and accounting. Interesting exploration technologies employed on the Project included the use of AEM, TDEM and NMR geophysical surveys, installation of jetted piezometers, analysis of delta inflows and outflows, and the development of ArcView™ GIS databases and groundwater models. 30 production boreholes were constructed to meet the Project's objectives.



**Komex International, Canada**

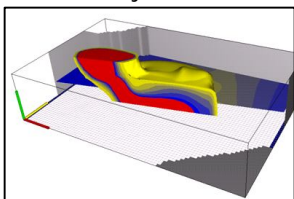
Between December 2000 and March 2001, he was employed in Canada to support the following activities:



- Groundwater source assessments at Lewis and Meadow Creek (Petro-Canada Oil & Gas leases), Fort McMurray. Exploratory drilling, pumping test analyses and aquifer modelling were carried out to examine the feasibility of providing water for the extraction of bitumen from oil-sands using Steam-Assisted Gravity Drainage recovery techniques (SAGD).
- Hydrogeological assessment of Isadore Lake. Exploratory drilling, pumping test analyses and aquifer modelling were carried out to examine the feasibility of injecting disposal water, from Albian Oils (Shells) operations, into a Cretaceous aquifer.
- Environmental impact assessment of Imperial Oil's activities in Devon, Alberta. This investigation included an assessment of lithology, groundwater flow, water quality (major ions, dissolved metals and organic compounds [phenols, naphthenic acids, BTEX, TVH, TEH, PAH]) and attenuation.

**Komex H<sub>2</sub>O Science, USA**

Between July and December 2000, he worked in California to assist with the following:



- Assessment of water quality impacts of selected oilfields in the Santa Maria River Basin.
- Preliminary environmental assessment of Hull Middle School Torrance.
- Conceptual & numerical groundwater model for Murrieta County Water District.
- Proposal to evaluate techniques to assess groundwater vulnerability to methyl tertiary-butyl ether (MTBE).

- Proposal to assess the impact of alkylphenol ethoxylates (endocrine disrupters) on Chinook salmon reproduction.
- Supplemental Hydrogeologic Site Investigations: Jefferson Middle School No. 1, Los Angeles. Investigation of primary hexavalent chrome (Cr<sup>+6</sup>) and trichloroethene (TCE) contamination.

### **Resources Services, Botswana**

Between June 1999 and April 2000, he was employed as the Team Leader of a study to evaluate the groundwater resources and potential of providing reticulated supplies to three villages on the edge of the Kalahari Desert. Responsibilities included managing a team of 24 staff, reporting, logistics, procurement, Project expenditure, billing and accounting. Leading edge technologies employed on the Project included: a helicopter-borne FDEM survey; the installation of a combined meteorological and groundwater monitoring station; use of chloride mass balances, groundwater recession analyses, and real-time remote sensing data to estimate the variability of recharge; sampling and analyses of Br, Cl, B and Li to determine the origin of various brines; and, <sup>14</sup>C, <sup>18</sup>O and <sup>2</sup>H sampling and analyses to determine the age and origin of recharge.



### **1991 - 1999 Ministry of Water Resources, Sultanate of Oman (Hydrogeology Expert)**

Initially, in 1991, he worked for the Recharge Section of the Ministry of Water Resources (MWR) to help evaluate existing and proposed recharge schemes in Oman. These evaluations included an assessment of a catchment's water balance, with and without scheme, using groundwater modelling (e.g. Modflow<sup>TM</sup>) and "accounting" techniques. In 1993 he became the Acting Project Manager for the Nejd Desert Assessment Programme, which was assigned with compiling a groundwater archive, installing a groundwater monitoring network, and estimating the volume of reserves and recoverable groundwater contained within aquifers of the Hadhramaut Group. In 1994 he joined the Technical Secretariat, which was tasked with writing and editing technical reports, developing assessment methodologies, evaluating external reports and providing assistance and advice to the D.G. In 1996 he was made the Project Manager for the Wahaybah Sands Assessment Programme, which was the largest drilling/ aquifer-testing contract ever undertaken by MWR. Mr Ashworth was responsible for running the Project, running a Regional Office, logistics and training, and was the main author of Project Reports. At the end of 1997 he was posted to Muscat to write a series of reports for the National Water Resources Master Plan.



### **1991 M J Carter Associates (Senior Hydrogeologist)**

He assessed the impact on groundwater resources of proposed mineral extractions and landfill sites in the U.K and France. He also helped evaluate the environmental liabilities of 37 landfill sites in the UK belonging to Biffa. The latter study was a semi quantitative assessment for a client who was interested in bidding for the Biffa Group. Risk assessments, and the potential liabilities of Biffa's landfill sites, were evaluated using a points system based upon a number of criteria, including: classification of each landfill according to their origin and characteristics; the type of containment; the importance of the underlying aquifer; the landfills proximity to residential areas; identification of potential pathways between each landfill and downstream receptors such as water courses, water supplies, rare habitats and woodlands; and, the presence/ absence of groundwater, surface water and gas monitoring stations on the periphery of each landfill.

### **1984 - 1990 Mott MacDonald International (formerly Sir M. MacDonald & Partners Ltd.)**

#### **1988 - 1990 Oman - various projects (Resident Hydrogeologist)**

Based in the Muscat Office, he was responsible for groundwater investigations conducted by MMI in Oman. Responsibilities included project management, making proposals, preparing tender documents, tender analyses, and writing preliminary, feasibility and final reports for a variety of studies. These studies included: investigation of groundwater recharge schemes; the design of small recharge and impoundment dams; well improvement works; investigations for the development of irrigated agriculture; and, the development of a new wellfield for Muscat.



**1987 - 1988 Pakistan Scavenger Well Studies (Hydrogeologist)**

This Overseas Development Administration (ODA) financed project was designed to test the feasibility of separating groundwater of different salinities. It involved the construction of wells and multiple piezometers to study the pressure distribution and water quality movements within variable density aquifers. Novel technologies used during this Project included the design and construction of asymmetrical wells, and the procurement of twin, variable-speed impellers, designed to run off a single pumping shaft. Responsible for field supervision of all aspects of the Project, including construction of piezometers, by reverse circulation, down-hole geophysics, initial quality distribution studies and long term (1-yr) pumping tests. This Project showed that the continuous abstraction of two different quality waters is practical from single or multiple wells.

**1986 - 1987 Cambridge (Hydrogeologist)**

At head office he participated in the preparation of borehole specifications for a water supply project in Malaysia and specifications for upgrading a pumping plant in East Anglia. Was also involved in the collection and collation of data for pump selection criteria for the Scavenger Well Study and Pilot Project in Pakistan, and the training of a Malaysian consultant in groundwater resource evaluation.

**1986 Geophysical Survey, Benue State, Nigeria (Hydrogeologist)**

A geophysical survey, in basement rocks, was carried out to help locate new production boreholes for two large towns in Benue State. A geophysical survey of a proposed dam site was also undertaken. This Project involved use of the combined EMT/VES method of geophysical surveying.

**1984 - 1986 Kano State Water Supply, Nigeria (Hydrogeologist)**

This World Bank financed Project for the Kano State Agricultural and Rural Development Authority established 1,100 village boreholes, for the installation of hand pumps, in Northern Nigeria. Mr. Ashworth was a member of the team responsible for the hydrogeological investigations, supervision of the drilling, and the testing of production boreholes. The work involved an evaluation of existing data, interpretation of aerial photography, satellite and SLAR imagery, planning and drilling operations, geological and geophysical surveys, selection of drilling sites, supervision of borehole construction, on-site chemical analyses and test pumping of the finished boreholes. In basement areas the Project evolved its own borehole siting procedures, leading to a very high success rate. The geophysical surveys included both vertical electric sounding methods using an ABEM Terrameter as well as traversing using a Geonics EM 34. A major technical innovation was the interpretation and development of the combined EMT/VES method of geophysical surveying.

**1984 Fort William Alluvium Investigations, Scotland (Hydrogeologist)**

Supervised drilling and testing investigations carried out to prepare a feasibility report concerning the abstraction of 100 l/s of water from the superficial deposits around Fort William, to augment water supplies to the planning horizon 2001. Work included the preparation of the report and general contract administration including checks of work measurement.

**1984 River Spey Alluvium Investigations, Scotland (Hydrogeologist)**

Involved in the chemical analysis of water samples, surveying and carrying out experiments on test columns for the removal of colour from water from the River Spey at Fochabers intake works.

**1984 Wimpey Laboratories, Geoconsult U.K Ltd. (Hydrogeologist)**

He assessed the dewatering requirements for the construction of deep underground foundations for a proposed nuclear power station in Dorset.



He supervised the construction of a large diameter borehole and a number of multiple piezometers in the Cretaceous Chalk in Essex, and supervised the subsequent pumping tests. The pumping tests involved the monitoring of five multiple piezometers using transducers and dip meters. He was involved in the analysis of the pumping test results and the factual report.

**1982 to 1983 Isles of Scilly Council (Hydrogeologist)**

This EEC-financed water resource survey of the Isles of Scilly included an assessment of saline intrusion, and nitrate and leachate contamination on the Islands of St. Mary's, St Agnes, Bryher and St. Martin's. It involved surface geophysical surveys, the installation of piezometers, pumping and slug-tests. The assessment of Hugh Town's water supply included an analysis of the hydraulic and aquifer properties of the alluvial aquifer, the geometry of the leachate plume, and a risk assessment of contaminating water supply wells. The later included groundwater sampling for typically key contaminants found in landfills taking domestic/ commercial wastes (NH<sub>4</sub>, Fe, Mn), common PHEs (Cu, Pb, Zn, As, Cd) and coliforms.

**1981 Comshare (Network Operator)**

After completing his first degree, Mr. Ashworth worked for a year as a Network Operator on mainframe Honeywell computer systems. Responsibilities included tracing faulty network links for large institutions and banks, data storage and other IT work.

---

**Computing Skills (a few examples)**

<b>1. Word Processing</b>		POWERPOINT 2003	: Good
WORD 2 to 2003	: Excellent	CORELDRAW 3 to 8	: Good
OPENOFFICE 3.0	: Good	ACAD 2000	: Slight
<b>2. Spreadsheets</b>		<b>5. Websites</b>	
EXCEL 4 to 2003	: Excellent	PAGEMILL 2 & 3	: Excellent
LOTUS 3.1	: Excellent	FRONTPAGE 2000	: Excellent
SUPERCALC	: Good	FTP	: Excellent
OPENOFFICE 3.0	: Good	CSS	: Good
<b>3. GIS &amp; Databases</b>		HTTP	: Good
MANIFOLD 6.5	: Excellent	ADOBE IMAGESTYLER	: Good
GLOBAL MAPPER	: Excellent	<b>6. Modelling &amp; programming</b>	
ARCGIS 9.3	: Good	MATHCAD 3 to 8	: Excellent
PARADOX 3.5 & 4.5	: Good	PMWIN (MODFLOW)	: Excellent
ACCESS 97 & 2003	: Good	PMPATH	: Good
DBASE 3 & 4	: Slight	GFLOW 2000	: Good
<b>4. Graphics</b>		VISUAL BASIC 6	: Good
PHOTOSHOP 7	: Excellent	MOC3D/MT3D	: Slight
SURFER 5 to 8	: Excellent	VBLUEBIRD	: Slight
		RUBY	: Slight
		PHP	: Slight

---

**Language Capability**

English	: Mother tongue
French	: Slight
Globish-French	: Excellent