

## **PART E - SERVICES REQUIREMENTS**

### **E1. DESCRIPTION OF THE SERVICES**

#### **E1.1 PURPOSE**

The purpose of the contract is to provide the SCA with a means of detecting changes to stream conditions within the SCA Catchment and to provide a reporting mechanism on aquatic ecosystem health across each of the 27 sub-catchments.

Specifically the purpose of this contract is:

- To detect changes in macroinvertebrate populations as an indicator of water quality, stream condition and catchment health throughout Sydney's drinking water catchment;
- To gather data which will contribute to baseline information on stream condition and catchment health, and provide details for reporting on catchment health within each of the SCA's hydrological sub-catchments;
- To interpret the longer-term historic and contemporary data available from this ongoing program to establish trends in stream conditions within each sub-catchment;
- To publicly report results in documents such as the Catchment Audit and Annual Environment Report; and
- To prepare a database of all available SCA macroinvertebrate data.

#### **E1.2 BACKGROUND**

The Sydney Catchment Authority (SCA) is a statutory body constituted by the *Sydney Water Catchment Management Act 1998* and has the primary function of protecting the quality and quantity of water in its catchment areas. Sydney's drinking water catchment is comprised of 27 sub-catchments that together cover over 16,000 square kilometers, and extend from north of Lithgow in the north-west, south to the source of the Shoalhaven River near Cooma, from the Woronora River in the east, to the source of the Wollondilly River west of Goulburn. Within this area there are 51,000 kilometres of streams.

The Macroinvertebrate Monitoring Program (MMP)(the subject of this contract) is an annual program of macroinvertebrate sampling and analysis that has been undertaken each spring since 2001. The program has an established protocol of sampling three sites within each of the 27 sub-catchments, totaling 81 sites across the SCA's entire catchment area. Of these three sites per sub-catchment, two are core or fixed sites for long-term monitoring, and the other one is a roaming site that is preferably in a different location each year to allow a wider area of the sub-catchment to be captured by sampling. The conceptual design of the MMP provides the core sites, that are generally located toward the bottom-end of each sub-catchment, to attempt to capture the accumulated affects of stream conditions from the upper tributaries and reaches and thereby represent the sub-catchment, and provides a roaming site to enable a wider area of each sub-catchment to be monitored over time to capture emerging trouble-spots and/or improving conditions.

The MMP is an annual spring sampling and annual reporting program, and is subject to a review that will occur concurrently (and independent of this Contract) with the subject of this Contract. The continuation of the program through this Contract will cover a spring 2008 sampling and reporting, with an a further one-year option (SCA's option and at SCA discretion) for continuation of the Contract to cover a spring 2009 sampling and reporting subject to the Contractor's performance and at the SCA's discretion (if the SCA requires a continuation). It is quite possible that the program will change in nature after 2008 and therefore a continuation of the current program in 2009 will not be needed.

### **E1.3 SCOPE:**

The Professional Services to be provided in accordance with the Contract shall include, but not be limited to the following annual program:

The overall annual scope of the project is:

- To sample macroinvertebrates in edge and (where available) riffle habitat at 81 sites made-up of two core sites and one roaming site within each of the SCA's 27 sub-catchments;
- To identify samples to family level;
- To identify sites with GPS and locate sites using a digital map;
- To report results using NSW AusRivAS scores along with a calculation of SIGNAL values;
- To utilise contemporary and historic data and provide a discussion on the stream conditions and associated catchment health of each sub-catchment;
- Provide a discussion of the results, that includes but is not limited to, the implications of the results for stream and catchment management on a sub-catchment basis, and the implications for future monitoring;
- To prepare and present catchment maps representing the AusRivAS and SIGNAL results for each site;
- To prepare and present the raw data, statistical analyses, and QA results;
- To prepare a data report incorporating habitat and other field variables, site access information and photographs;
- To review, interpret and report on trends and issues apparent within the historic and contemporary MMP data; and,
- To prepare a final report on the above.

In addition, the Contractor will be required to:

1. At the commencement of each annual program, attend initial meeting with the SCA at its Penrith Office, to discuss project matters including the selection of roaming sites.
2. Sampling macroinvertebrates as indicated above and as in Table 1 below (to be used as guide only). Sampling is to be initially undertaken in spring 2008 (preferably starting in mid October) in both edge and (where available) riffle

habitat, and prices are required in the tender for a 2008 program and an option for a 2009 program.

Macroinvertebrate sampling is to be undertaken in riffles (where present) and edge habitats in accordance with the NSW AUSRIVAS methods (<http://ausrivas.canberra.edu.au>) and reported using NSW AusRivAS, and SIGNAL scores and values.

Table 1: Site locality and sample details for the SCA MMP Spring 2003 (provided as a guide).

	Sub-Catchment	Site Code	Site Name	Latitude	Longitude	Habitats Sampled
Hawkesbury	Grose	MMP39	Woodford Creek @ Woodford Dam	33.6974	150.48568	E
Hawkesbury	Grose	MMP40	Yosemite Creek upst Minnehaha Falls	33.68591	150.32642	E
Hawkesbury	Grose	MMP60	Cascade Creek at d/s Cascades	33.68444	150.30583	Dry
Nepean	Upper Nepean	BWN1	Doudles Folly Creek @ Diamond Fields Rd	34.5125	150.52444	E & R
Nepean	Upper Nepean	MMP20	Nepean River @ Maguires Xing	34.47627	150.5343	E
Nepean	Upper Nepean	MMP61*	Nepean River @ Kangaloon			Backup site not visited
Nepean	Upper Nepean	N935	Nepean River upst Pheasants Nest	34.24647	150.66693	E & R
Shoalhaven	Back + Round	MMP16	Witts Creek @ Krawaree Rd xing	35.60659	149.61447	E & R
Shoalhaven	Back + Round	MMP17	Shoalhaven River @ Farrington Xing	35.50914	149.67196	E & R
Shoalhaven	Back + Round	MMP62	Jembaicumbene Ck @ Bendoura	35.50167	149.71583	E
Shoalhaven	Boro	E890	Boro Creek @ Marlowe	35.23021	149.84681	E
Shoalhaven	Boro	MMP33	Kings Creek up/st Boro Creek	35.1815	149.72366	E
Shoalhaven	Boro	MMP63	Millendale Ck @ Glendor	35.18426	149.78983	Dry
Shoalhaven	Braidwood	E860	Shoalhaven River @ Mount View	35.44934	149.7207	E & R
Shoalhaven	Braidwood	E891	Gillamatong Creek @ Braidwood	35.42535	149.7366	E
Shoalhaven	Braidwood	MMP64	Little Bombay Ck @ Little Bombay	35.41167	149.67389	E
Shoalhaven	Braidwood	MMP64*	Bombay Ck @ Little Bombay			Backup site not visited
Shoalhaven	Bungonia	A8	Bungonia Creek @ Bungonia	34.853028	149.94336	E
Shoalhaven	Bungonia	E847	Shoalhaven River @ Fossikers Flat	34.8175	150.20076	E & R
Shoalhaven	Bungonia	MMP65	Stoney Ck @ Marulan Rd	34.75888	149.96889	E
Shoalhaven	Endrick	MMP11	Titringo Creek @ High Forest	35.09347	150.07766	E
Shoalhaven	Endrick	MMP12	Endrick River @ Nerriga	35.08635	150.11734	E & R
Shoalhaven	Endrick	MMP66	Nadgengutta Ck @ Nerriga Rd	35.13833	150.06722	E

Shoalhaven	Jerrabuttgulla	MMP08	Boggy Creek upst Shoalhaven R confluence	35.78929	149.63869	E
Shoalhaven	Jerrabuttgulla	MMP09	Jerrabattgulla Creek @ Warragandra	35.6814	149.593	E
Shoalhaven	Jerrabuttgulla	MMP67	Stoney Ck @ Oranmeir	35.69028	149.6375	E
Shoalhaven	Jerrabuttgulla	MMP67*	Shoalhaven R @ Oranmeir			Backup site not visited
Shoalhaven	Kangaroo	E706	Kangaroo River @ Hampton Bridge	34.728	150.52136	E & R
Shoalhaven	Kangaroo	MMP43	Kangaroo River @ Upper Kangaroo	34.68472	150.6006	E & R
Shoalhaven	Kangaroo	MMP68	Barrengarry Creek @ Sunnyvale	34.70278	150.53139	E & R
Shoalhaven	Mid Shoalhaven	E8311	Corang River @ Meangora	35.14543	150.04317	E
Shoalhaven	Mid Shoalhaven	E861	Shoalhaven River @ Hillview	35.18208	149.953	E & R
Shoalhaven	Mid Shoalhaven	MMP69	Oallen Creek @ Oallan Ford	35.14722	149.95611	E
Shoalhaven	Mid Shoalhaven	MMP69*	Shoalhaven River @ Oallan Ford			Backup site not visited
Shoalhaven	Mongarlowe	MMP70	Feagans Ck @ Charlies Forest Rd	35.41651	149.96741	E & R
Shoalhaven	Mongarlowe	MONG1	Mongarlowe River @ Charleyong	35.25125	149.92159	E & R
Shoalhaven	Mongarlowe	R13	Mongarlowe River @ Monga	35.54319	149.92988	E & R
Shoalhaven	Nerrimunga	E8361	Nerrimunga Creek @ Minshall Trig	35.00894	149.93277	E
Shoalhaven	Nerrimunga	MMP51	Jacqua Creek @ Lumley Rd	34.93714	149.84472	E
Shoalhaven	Nerrimunga	MMP71	Windellama Ck @ Windellama	35.00172	149.88942	E
Shoalhaven	Nerrimunga	MMP71*	Nadgigomar Ck @ Blanket Burn Rd			Backup site not visited
Shoalhaven	Reedy	MMP72	St Omer Ck @ Euradux	35.36466	149.81757	E
Shoalhaven	Reedy	R7	Mulloon Creek @ Tawarri	35.33418	149.58566	E & R
Shoalhaven	Reedy	Reed1	Reedy Creek @ Mayfield Rd	35.30935	149.759	E & R
Shoalhaven	Upper Shoalhaven	MMP06	Shoalhaven River @ Yarra Glen	34.84466	149.64001	E & R
Shoalhaven	Upper Shoalhaven	MMP73#	Jinden Ck @ Krawaree Rd xing	35.88444	149.59306	E & R
Shoalhaven	Upper Shoalhaven	MMP73	Little Snowball Creek @ Little Snowball			Dry
Shoalhaven	Upper Shoalhaven	R8	Currembene Creek @ Krawaree Rd xing	35.89098	149.59496	E & R
Warragamba	Kowmung	E130	Kowmung River @ Cedar Ford	33.94577	150.24502	E & R
Warragamba	Kowmung	MMP14	Kowmung River @ Kowmung Fire Trail	33.95586	149.97779	E & R
Warragamba	Kowmung	MMP74	Sheepstation Ck @ Tuglow Rd			Private property
Warragamba	Lake Burragorang	MMP01	Tonalli River up/st Yerrandrie	34.1319444	150.183333	Dry
Warragamba	Lake Burragorang	MMP02	Tonalli River upst Basin Ck confluence	34.10353	150.26675	E
Warragamba	Lake Burragorang	MMP75	Basin Creek @ Yerranderie Rd	34.12611	150.23528	Dry

Warragamba	Little River	MMP04	Blue Gum Creek along fire trail W4I	34.2152	150.48938	E
Warragamba	Little River	MMP05	Little River @ Fire Trail W4I	34.18919	150.46594	E & R
Warragamba	Little River	MMP58	Little River @ Buxton	34.26191	150.51224	E
Warragamba	Lower Cox's	E157	Kedumba River @ Kedumba Xing	33.80299	150.36355	E & R
Warragamba	Lower Cox's	MMP76	Leura Falls Creek @ FT W74	33.7497222	150.329444	E
Warragamba	Lower Cox's	MMP77	Jamison Creek @ Jamison Valley	33.76447	150.35186	E & R
Warragamba	Mid Cox's	E086	Coxs River @ Kelpie Point	33.87166	150.2538	E & R
Warragamba	Mid Cox's	MMP55	Little River @ Six Foot Track	33.76537	150.13575	E & R
Warragamba	Mid Cox's	MMP78	Megalong Ck @ Old Ford Reserve (Megalong Valley Rd)	33.73217	150.235	E
Warragamba	Mulwarree	A5	Mulwaree River @ Lake Bathurst	35.01734	149.65313	E
Warragamba	Mulwarree	E457	Mulwaree River @ The Towers	34.78062	149.70775	E
Warragamba	Mulwarree	MMP79	Crisps Ck @ Bungendor	35.08361	149.63389	E
Warragamba	Nattai	E206	Nattai River @ The Craggs	34.39076	150.42502	E & R
Warragamba	Nattai	E210	Nattai River @ the causeway	34.14333	150.42466	E & R
Warragamba	Nattai	MMP80	Gibbergunyah Ck ds Mittagong STP	34.44333	150.43694	E
Warragamba	Nepean	MMP03	Werri Berri Creek @ Serenity Park (F/T W10A)	33.97936	150.55922	E & R
Warragamba	Nepean	MMP57	Werri Berri Creek @ The Oaks	34.08907	150.56116	E
Warragamba	Nepean	MMP81	Spring Ck @ Werombi	33.96555	150.56615	Dry
Warragamba	Upper Cox's	A16	Coxs River @ Lidsdale	33.38059	150.07798	E & R
Warragamba	Upper Cox's	MMP37	Coxs River @ McKanes Bridge	33.54952	150.12444	E & R
Warragamba	Upper Cox's	MMP82	Lowther Ck @ Ecclesbourne			Private property
Warragamba	Upper Cox's	MMP82*	Lowther Ck @ Old Bathurst Rd			Private property
Warragamba	Upper Wollondilly	MMP27	Wollondilly River @ Goonagulla	34.66412	149.52425	E
Warragamba	Upper Wollondilly	MMP83#	Pejar Ck @ Woodhouselee	34.57248	149.62978	E
Warragamba	Upper Wollondilly	MMP83	Kialla Ck @ Woodhouselee			Dry
Warragamba	Upper Wollondilly	Uwo1	Wollondilly River @ Baw Baw Bridge	34.74883	149.65896	E
Warragamba	Wingecarribee	MMP84	Medway Rivulett @ Old Hume Hwy	34.5296	150.30602	E
Warragamba	Wingecarribee	U10	Wingecarribee River @ Berrima	34.49112	150.33213	E & R
Warragamba	Wingecarribee	Winge2	Wingecarribee River @ Greenstead	34.4167	150.19289	E & R
Warragamba	Wollondilly	A6	Tarlo River @ Tarlo	34.60536	149.80126	E
Warragamba	Wollondilly	E488	Wollondilly River @ Jooriland	34.22634	150.25412	E

Warragamba	Wollondilly	MMP85	Narambulla Ck @ Carrick	34.68036	149.89818	E
Woronora	Woronora	GO515	Woronora River @ the Neddles	34.04677	151.00619	E & R
Woronora	Woronora	R21	Waratah Rivulet @ Flat Rock Xing	34.19604	150.93453	E
Woronora	Woronora	WON01	Woronora River @ Gurra Xing	34.10656	150.94793	E

- - backup sites not sampled; # - backup sites sampled; E=Edge, R=Riffle.

3. Prepare a site description for each site (including a map and photographs);
4. Record physical, chemical and habitat variables described in the AusRivAS methods manual for each site at the time of macroinvertebrate sampling and reported to the SCA in a separate report within four weeks from the last sampling date. This data is to be provided in Microsoft® Excel format. Legible photocopies of raw data sheets are also to be provided to the SCA. Site descriptions and photographs, as indicated in Point 3 above, are also to be included in this report. 1 bound hard-copy and 1 cd digital copy, including photographs;
5. Identify macroinvertebrates to the family level of taxonomic resolution (see NSW AusRivAS web site for details). Details of the identification are to be provided to the SCA including taxonomic keys used, magnification used for microscopy, and staff training in quality control procedures. Upon the completion of identification and quality assessment of randomly selected samples, all samples must be returned to their original sampling containers and preserved using 70% ethanol for long-term archiving;
6. Provide a spreadsheet of all raw field data results indicating the presence or otherwise of relevant species, including site name, site code, family, genus, and/or species present at each site, by end of March 2009;
7. Undertake Quality Assurance procedures at all stages of the program, including those recommended under the AusRivAS method, such as 5-10% of field picked macroinvertebrate samples be retained, sorted and identified in the laboratory, and the results compared against the field picked identifications;

A Draft Report is to be provided in early April 2009 for comment by the SCA. The SCA comments are to be incorporated in the final report and the report is to be provided in Microsoft Word 97 format by End May 2009.

Please provide detail, including schedules of rates and lump-sum fees, for a 2008 & 2009 spring program (discrete fees quoted). The SCA reserve the right to terminate the Contract at the completion of the 2008-sampling event (and associated reporting) for any reason, including poor performance or the need for significant changes to the monitoring program in future years. Performance will be monitored by SCA, including auditing of the field sampling at the discretion of the SCA, and SCA reporting on the contractor's compliance with performance indicators.

**E1.4 TIMEFRAME AND DELIVERABLES:**

	<b>Deliverable</b>	<b>Timeframe</b>
1	Initial meeting	September 2008
2	Sampling 81 sites	Commence mid-October 2008 completed by mid-November 2008
3	Sample Identification	End December 2008
4	Statistical Analysis	Complete early February 2009
5	Raw Data Report	End March 2009
6	Report Writing <ul style="list-style-type: none"> <li>- AusRivAS variables report and site access description and photographs</li> <li>- Draft Report (including statistical analyses)</li> <li>- Final Report</li> </ul>	<p>Within four weeks of last sampling date</p> <p>Early April 2009</p> <p>Early May 2009</p>
7	Project Management	

The following, outlining some of the key deliverables, shall be delivered to the SCA at milestone achievement dates:

- A Work Plan for the Contract, incorporating site access requirements and itinerary plan, literature and document requirements, relevant permits and authorisations, etc in digital format within two weeks of Contract commencement;
- An agreed Safety Management Plan within two weeks of Contract commencement (1 signed and bound hard copy and 1 digital copy);
- AusRivAS Data Report, incorporating field sheets on habitat variables, water quality, site location map and access details (1 bound hard copy and 1 cd digital copy);
- A 1<sup>st</sup> Draft Report (1 unbound & 1 digital copy in MS Word and other appropriate formats).
- A 2<sup>nd</sup> Draft Report, if required (1 unbound & 1 digital copy in MS Word and other appropriate formats).
- A Final Report (5 bound, 1 unbound & 5 digital copies in MS Word and other appropriate formats).



## **E2. OHS & R**

### **E2.1 General Requirements**

- (a) The Occupational Health and Safety Act 2000 requires that employers and employees ensure the health, safety and welfare of persons in the workplace. The Service Provider is required to observe all statutory/regulatory safety requirements and to provide for the protection of persons and property as part of the Contract.
- (b) While working on SCA's premises and/or worksites the Service Provider shall also comply with SCA's occupational health, safety & rehabilitation (OHS&R) policies and Corporate Instructions as well as SCA directions.
- (c) The Service Provider shall, at all times, exercise any other necessary and reasonable precautions appropriate to the nature of the Services and the conditions under which the Contract is to be performed for the safety of all persons involved in or affected by that Services.
- (d) The Service Provider shall prepare a 'Project Safety Plan', which shall include appropriate controls to minimise the OHS&R hazards & risks associated with the provision of the Services taking into account SCA's Hazard Risk Identification for the Services and the Site in clause F2 to this Contract.
- (e) The Service Provider shall include in the Project Safety Plan as a minimum:
  - (i) Description of the Services.
  - (ii) Name and qualifications of the person or persons who will supervise the Services.
  - (iii) Name and qualifications of the person or persons who will inspect, approve and supervise methods for the provision of the Services, protective measures, use of equipment.
  - (iv) Potential risks associated with the Services, including without limitation, the risks associated with interfacing with ongoing SCA operations and with any other work persons or contractors on the site/s.
  - (v) What OHS&R training is given to persons involved with the provision of the Services.
  - (vi) All precautions to be taken to protect health and safety.
- (f) The Project Safety Plan shall cover the eleven key elements contained in the current NSW Government OHS&R Management System Guidelines and shall incorporate the requirements of that publication's "Corporate OHS&R Management System".
- (g) The Service Provider shall supply a Project Safety Plan to the SCA at least 7 days prior to the performance of the those portions of the Contract which are to be performed outside the office environment. The responsibility for the

adequacy of the Project Safety Plan always remains with the Service Provider.

- (h) The Service Provider shall implement the Project Safety Plan and shall carry out frequent workplace inspections to ensure that OHS&R controls are in place, systems are implemented, OHS&R risks are identified and promptly addressed. The Service Provider shall ensure that subcontractors follow the requirements of the Project Safety Plan.
- (i) The Project Safety Plan shall detail the OHS&R systems and procedures which will apply during the term of the Contract, including all relevant aspects of the Services and in regard to sub-contractors.
- (j) The Service Provider shall submit the Project Safety Plan for review and formal sign-off by the SCA prior to the grant of Site possession.
- (k) The Service Provider shall immediately notify WorkCover and the SCA of any serious accident or dangerous occurrence. The Service Provider shall then formally notify WorkCover in accordance with the *Occupational Health and Safety Regulation 2001*, using the prescribed form, and immediately supply an additional copy to the SCA.

### **E3. ENVIRONMENTAL REQUIREMENTS**

#### **E3.1 Noiseworks Requirements**

Equipment supplied and installed may need to provide a quiet working environment for SCA personnel and others such as nearby residents. The Service Provider shall comply with the OH&S Regulation 2001 and WorkCover Code of Practice: Noise Management and Protection of Hearing at Work.

#### **E3.2 Purchasing**

The Service Provider shall purchase and use recycled content products where appropriate.

#### **E3.3 Waste Management**

- (a) The SCA promotes use of the recycled paper to protect the environment. The Service Provider shall print all documents and reports required by the Authority **on a minimum 50% recycled content paper**.
- (b) Where it is not practical for the Service Provider to use recycled paper for printing of reports and documents, the Service Provider shall obtain written approval from the SCA before printing reports or documents on non-recycled paper.

#### **E3.4 Energy Management**

- (a) All equipment used in or supplied in the provision of the Services under this Contract should minimise energy use. Equipment should meet best practice in energy management by being the most efficient of its class, and by using the most appropriate energy source for the application (whether that be

electricity, natural gas or LPG, a renewable energy source, or any other fuel). This is to ensure low ongoing costs for the operation of the installation.

- (b) Energy star for office equipment and energy ratings for (usually household) appliances can be used where appropriate.

#### **E4. SPATIAL DATA REQUIREMENTS**

- (a) All spatial data will be supplied to the Service Provider in ESRI personal geodatabase format in Geographic Coordinate System (GCS) and Geocentric Datum of Australia 1994 (GDA94).
- (b) All spatial data supplied to the SCA by the Service Provider shall be in Geographic Coordinate System (GCS) and Geocentric Datum of Australia 1994 (GDA94) in ESRI personal geodatabase format.
- (c) All geographical information systems or components of spatial tools must conform to the SCA Corporate GIS standards. All software must be coded in ArcObjects and/or be compatible with the latest ESRI ArcGIS products. All spatial software products shall be capable of reading and writing vector and raster data to ESRI ArcSDE in a Microsoft SQLServer environment.